# 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society

**EMBC'17**

**JeJu, Korea**

## July 11-15 2017

JeJu International Convention Center
Jeju Island, South Korea

**Conference Chairs**
Kwang Suk Park
Yongmin Kim
James Weiland

**Program Chairs**
Eung Je Woo
Yuan-ting Zhang
Thomas Penzel

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# Partnership Acknowledgements

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## Bronze Level Partner





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# President's Welcome Message

**Nigel Lovell**
Scientia Professor and Head, Graduate School of Biomedical Engineering
UNSW Sydney, NSW Australia

**Engineering in Biology and Medicine Society**
2017-2018 EMBS President
president@embs.org

It is my great pleasure and honor to welcome you to the 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) and the 4th KOSOMBE International BioMedical Engineering Conference. Our Flagship Annual Conference (known as EMBC) is a premier international event in biomedical engineering, and has been strategically held in different locations around the world, including Orlando, Milan, Chicago, Osaka, San Diego, Boston, Buenos Aires, Minneapolis, Vancouver, Lyon over the last 10 years. Looking forward, our next events will be held in places such as Hawaii (July 17-21, 2018), Berlin, Montreal, Glasgow and Sydney.

This year's meeting is being held in Jeju Island, Korea with the theme 'Smarter Technology for a Healthier World'. Under the strong and dedicated leadership of Conference Chairs (Drs Kwang Suk Park, Yongmin Kim, Jim Weiland) and Program Chairs (Drs Eung Je Woo, Yuan-ting Zhang, Thomas Penzel) and with a special thanks to the Clinical Relations Chair (Dr Jongmo Seo), the organizing committee has developed an exciting inter-disciplinary program. Multiple preconference workshops, special sessions and minisymposia discussing important biomedical engineering issues with academic researchers, clinicians, and research and development engineers are combined with traditional oral sessions and *ignite* poster sessions as platforms for presentation of over 2500 papers. In addition, there are lunchtime sessions to further promote, educate and expose students to the diverse field of biomedical engineering. The organizers have also successfully recruited an all-star roster of ten keynote speakers and fifteen theme keynote speakers, who are leaders and pioneers within their respective fields from around the world.

All the submitted contributed papers were subject to peer review by the EMBS Conference Editorial Board (CEB), consisting of an international panel of experts, covering all areas of biomedical engineering. This resulted in a 25% rejection rate. Special thanks go to, Dr Jim Patton, Editor-in-Chief of the CEB, the associate editors and reviewers of the CEB, and all the staff of the EMBS Executive Office (Laura Wolf and Janice Sandler) for their outstanding service and contributions toward making this meeting possible.

EMBS continues to strive to provide a unique, effective platform for biomedical engineers to publish, present their research, network with industry, and to advance their professional careers. A major focus of EMBC'17 will be the engagement with the dozen eleven technical committees (TCs) that are the specialist expertise groups with which individual members can interact with aspects of the Society. We would welcome anyone who is interested to make themselves known to the TC Chairs that will be attending the conference and will present TC activities during the TC workshops. TCs have leading roles within EMBS, being strategically involved in EMBC and Special Topics Conferences, award nominations, editorial boards of EMBS journals and launching of new initiatives. Again, welcome to EMBC'17. On behalf of EMBS we appreciate your participation and trust you find this meeting intellectually stimulating, socially rewarding and culturally revealing. As always if you have comments or would like to be more involved in our society, please contact myself or the Executive Office.

Nigel Lovell, Ph.D., President EMBS, 2017 – 2018

# Welcome Message from Organizing Committee

Dear Colleagues,

On behalf of the EMBC'17 Organizing Committee, it is our great pleasure to welcome you to the 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) and the 4th KOSOMBE International BioMedical Engineering Conference.

EMBC'17 continues the IEEE EMBS' Annual Conferences, which have become a key meeting ground for the international biomedical engineering community, bringing together academic experts, clinicians, industry representatives, and students from the broad spectrum of areas that constitute biomedical engineering.

This year's theme, "Smarter Technology for a Healthier World," reflects an accelerating trend for the use of information and intelligence technology toward breakthroughs that were considered impossible a decade ago and continually improving the healthcare in the future. EMBC'17 covers a wide range of thematic areas in biomedical engineering with two specially-added themes, "Translational Engineering for Healthcare Innovation & Commercialization" and "Pharmaceutical Engineering and Drug Delivery Systems."

The Conference starts on July 11th with workshops and tutorials, while its scientific program will follow from July 12th to 15th. The program this year includes a diverse array of approximately 2,500 papers and talks. These papers will be presented in the form of platform talks and posters, and in various kinds of sessions that include workshops, tutorials, mini-symposia, invited sessions, special sessions, regular oral sessions, ignite sessions for posters, and poster displays. For each poster, we have extended a poster's display to a full day and provides 2 minutes in an oral ignite session to present their poster highlight. We have also organized various social sessions supporting the young generation of EMBS biomedical engineers and women such as "Lunch with the Leaders," "Meet the Editors," "Women in Engineering Luncheon," "Student Paper Competition," and so on. To make the site as the place for the cutting edge of the technology, we invited the world-renowned experts and leaders as the keynote speakers in 10 plenary and15 theme keynote sessions.

While the scientific program promises to be an outstanding experience, we hope that you will also have some time to enjoy all that the Natural World Heritage Island of Jeju offers. Jeju Island is the largest island and the smallest province of Korea. It is famous for its beauty and as a place to experience the mystery, unique culture, tradition and leisure activities. Jeju Island is covered with lush subtropical forests, lava caves of all shapes, sandy beaches, spectacular craters, while Halla Mountain poises silently in the middle of the Island.

We would like to take this opportunity to thank all the members of the Organizing Committee, all the authors, all the reviewers, and all the volunteers for their efforts and valuable support to make EMBC'17 a reality.

| Conference Chair | Conference Co-Chair | Conference Co-Chair |
|---|---|---|
| Kwang Suk Park<br>SNU, Korea | Yongmin Kim<br>POSTECH, Korea | James Weiland<br>UMich, USA |

| Program Chair | Program Co-Chair | Program Co-Chair | Conference Editor-in-Chief | IBEC Conference Chair |
|---|---|---|---|---|
| Eung Je Woo<br>KHU, Korea | Yuan-ting Zhang<br>CAS Key Lab. China | Thomas Penzel<br>CUB, Germany | James Patton<br>UIC, USA | Hun-Kuk Park<br>KHU, Korea |

# General Conference Information

## Registration

Registration is located in the Lobby on the 3$^{rd}$ Floor of the Jeju International Convention Center and will be open Tuesday, July 11$^{th}$ through Saturday, July 15th. Staff will be able to assist you during the following time schedule.

| | |
|---|---|
| Tuesday | 07:30 – 17:30 |
| Wednesday | 07:00 – 20:00 |
| Thursday | 07:00 – 18:00 |
| Friday | 07:30 – 18:00 |
| Saturday | 07:30 – 13:00 |

**Attendees must wear their badges at all times to gain access to the conference.**

Tickets for companions can be purchased at the registration desk. Tickets must be purchased for companions to enter any social event.

## Exhibits

Exhibits will be located in the Galvani Event Hall  1$^{st}$ Floor at the Jeju ICC

Exhibition  Hours Wednesday, July 12th– Friday, July 14th     08:00 – 18:50

**Exhibitor Set-Up**
Tuesday, July 11th                     09:00 – 18:00

**Exhibitor Tear-Down**
Friday, July 14$^{th}$                      19:00 – 20:00

## WiFi

Free WiFi will be available through-out the ICC Meeting & Exhibit Space.

## Instructions for Authors

**Poster Presentations**
Velcro or Push Pins will be provided to attach your posters to your assigned poster-board.

Your poster must be up before the time of your presentation on the day that your Ignite Session is scheduled, and removed after your scheduled poster presentation of that day. If your poster is left behind, it will be discarded.

**Ignite Sessions:  Wednesday, Thursday, and Friday  July 12-14   16:10 – 17:10**

**Poster Sessions: Wednesday, Thursday, and Friday July 12-14    17:20 – 18:50**

**Please be sure to verify your scheduled presentation time.**

## Author No Show Policy

EMBS enforces a "no show" policy. Any accepted paper included in the final program is expected to have at least one author attend and present the paper at the conference. Authors of the accepted papers included in the final program who do not attend the Conference will be subscribed to a "No Show List", compiled by the Society. The "no-show" papers will be removed from the Master DVD and noted as "Author unavailable for presentation" prior to submitting to IEEE for inclusion in Xplore. The "No Show List" will be available to all EMBS conference organizers, who can reject submissions from these authors in the following two years, based on their past negative impact on an EMBS conference.

# Student, WIE and EMB Society Activities

| Time | July 12, 2017 (Wednesday) | Room |
|---|---|---|
| 8:00-9:30 | Student Paper Competition I | Lee Room |
| 12:20-13:20 | Lunch with Leaders I | Ocean View |
| 13:20-14:10 | Student Paper Competition II | Lee Room |
| 14:20-15:50 | Student Paper Competition III | Lee Room |
| 17:20-18:50 | Student Paper Competition Decision Making | Dunn Room |

| Time | July 13, 2017 (Thursday) | Room |
|---|---|---|
| 12:20-13:20 | Lunch with Leaders II | Ocean View |
| 13:20-14:10 | Meet the Editors of EMBS Publications | Lee Room |
| 14:20-15:50 | Technical Writing Workshop Getting Published in Biomedical Engineering | Rushmer Room |
| 17:20-17:35 | Student Paper Competition Presentation | Event Hall |
| 19:00-20:00 | Associate Editors Reception | Ocean View |

| Time | July 14, 2017 (Friday) | Room |
|---|---|---|
| 12:20-13:20 | Lunch with Leaders III | Room 201 |
| 12:20-14:10 | WIE Luncheon & Mini-Symposium | Ocean View |
| 14:20-15:50 | Tips for Effective Presentation / Poster Design and Delivery | Herrick Room |
| 19:00-21:00 | Student and Young Professionals Reception | Einthoven Hall |

# Publication

| Time | July 12, 2017 (Wednesday) | Room |
|---|---|---|
| 17:20-18:50 | TBME Editorial Board Meeting | Min Room |

# Technical Committee

| Time | July 11, 2017 (Tuesday) | Room |
|---|---|---|
| 12:00-17:00 | EMBS Technical Activities Chair Meeting | Webster Room |

| Time | July 12, 2017 (Wednesday) | Room |
|---|---|---|
| 12:20-13:20 | TC Robotics (Alicia Casals) | Zworykin Room |
| 12:20-13:20 | TC Biomedical Image & Imaging Processing (Marius Linguraru) | Herrick Room |
| 12:20-13:20 | TC Biomedical Signal Processing (Laura Astolfi) | Schwan Room |
| 12:20-13:20 | TC Therapeutic Systems & Technologies (Punit Prakash) | Plonsey Room |
| 12:20-13:20 | TC Cardiopulmonary Systems (Thomas Heldt) | Schmitt Room |
| 12:20-13:20 | TC Wearable Biomedical Sensors & Systems (Carmen Poon) | Greatbach Room |
| 12:20-13:20 | TC EMBS Standards (Carole Carey) | Geddes Room |
| 12:20-13:20 | TC NanoBioTechnology and BioMEMS (Esmaiel Jabbari) | Dunn Room |
| 12:20-13:20 | TC Biomedical and Health Informatics (Andrew Laine) | Schaldach Room |
| 12:20-13:20 | TC Translational Engineering for Healthcare Innovations (Thomas Penzel) | Rushmer Room |
| 17:20-18:50 | Workshop on EMBS Technical Activities 1 | Lee Room |

| Time | July 13, 2017 (Thursday) | Room |
|---|---|---|
| 12:20-13:20 | Workshop on EMBS Technical Activities II | Lee Room |
| 17:30-19:30 | IEEE Standards Working Group Meeting (Carole Carey) | Dunn View |

| Time | July 14, 2017 (Friday) | Room |
|---|---|---|
| 8:00-12:00 | IEEE Neuro Technologies Industry Connection Group (Carole Carey) | Room 201 |
| 12:20-13:20 | EMBC 2017-18 Meeting | Room 202 |

The IEEE Engineering in Medicine and Biology Society advances the application of engineering sciences and technology to medicine and biology, promotes the profession, and provides global leadership for the benefit of its members and humanity by disseminating knowledge, setting standards, fostering professional development, and recognizing excellence.

The field of interest of the IEEE Engineering in Medicine and Biology Society is the application of the concepts and methods of the physical and engineering sciences in biology and medicine. This covers a very broad spectrum ranging from formalized mathematical theory through experimental science and technological development to practical clinical applications. It includes support of scientific, technological and educational activities.

## Publications

IEEE PULSE: A Magazine of the IEEE Engineering in Medicine and Biology Society
Transactions on Biomedical Engineering
Journal of Biomedical and Health Informatics
Transactions on Neural Systems and Rehabilitation Engineering
Journal on Translational Engineering in Health & Medicine
Reviews on Biomedical Engineering
Transactions on NanoBioscience
Transactions on Medical Imaging
Transactions on Computational Imaging
Transactions on Biomedical Circuits and Systems
IEEE Transactions on Radiation and Plasma Medical Sciences
Journal on Electromagnetics, RF & Microwaves in Medicine

## Electronic Products

EMBS Electronic Resource
EMBStv on YouTuibe

## Conferences

Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)
IEEE EMBS Special Topic Conference on Neural Engineering (NER)
International Symposium on Biomedical Imaging (ISBI)
International Conference on Biomedical Robotics and Biomechatronics (BIOROB)
International Conference on Rehabilitation Robotics (ICORR)
Healthcare Innovation and Point-Of-Care Healthcare Technologies Conference (HICPT)
EMBS Micro and Nanotechnology in Medicine (MNM)
IEEE EMBS International Conference on Body Sensor Networks (BSN)
IEEE EMBS International Conference on Biomedical and Health Informatics (BHI)
IEEE EMBS Student Conferences: For Students, By Students (ISC)
Grand Challenges Conference Series (GCBE)

## Summer Schools

International Summer School on Biomedical Imaging
International Summer School on Biomedical Signal Processing
International Summer School on Biocomplexity, Biodesign and Bioinnova
International Summer School on Information Technology in Biomedicine
International Summer School on Emerging Technologies and Applications in Telemedicine
International Summer School on Neural Engineering
International Summer School on Computer Modeling in Medicine

# IT'S #EMBC17 - SEE YOU ON SOCIAL MEDIA!

Don't be shy, join in the conversation - be sure to use #EMBC17 in your Facebook and Twitter posts from the conference.

Stay connected with the IEEE Engineering in Medicine & Biology Society throughout the year.

Join us on Facebook, Twitter, Instagram and our LinkedIn Group and Company profiles for all the latest EMB Society news, events, networking opportunities, and more!

facebook.com/IEEEembs

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instagram.com/ieeeembs

# #EMBC17

# Organizing Committee

Conference Chair: Kwang Suk Park

Conference Co-Chair: Yongmin Kim

Conference Co-Chair: James Weiland

Program Committee Chair: Eung Je Woo

Program Committee Co-Chair: Yuan-ting Zhang

Program Committee Co-Chair: Thomas Penzel

Finance Chair: Jae Sung Lee

Workshop/Tutorial/Mini-symposium/Invited Session/Special Session Co-Chairs: Atam Dhawan and Yoonkey Nam

Conference Editorial Board Chair: Jim Patton


Student/Young Professional/Membership Activity Chair: Steve Wright

Student Paper Competition Co-Chairs: Yingchun Zhang and Kyung Min Byun

Young Professional Activities Co-Chairs: Lei Ding and Myunghwan Choi

Industrial Relations Co-Chairs: Bruce Hecht and Byungjo Jung

Clinical Relations Chair: Jongmo Seo

Student Volunteers Co-Chairs: Hans van Oostrom and Min Joo Choi

Women In Engineering Co-Chairs: Jennifer H. Shin, Lisa Lazareck-Asunta, and Hyunjoo J. Lee


Exhibit and Sponsor Chair: Young Bin Choy

Publication Chair: Hyunjoo J. Lee

Webmaster: Hans van Oostrom


EMBS Executive Office Team:

Laura Wolf, Adrian Plummer, Janice Sandler, Michael Markowycz, and Scott Woodhouse

# Program Themes and Chairs

**Theme 1. Biomedical Signal Processing**
    **Chair**
        Laura Astolfi, *Sapienza University, Italy*
    **Co-Chairs**
        Chang-Hwan Im, *Hanyang University, Korea*
        Jie Tian, *Beijing CAS, China*
        Yoshiharu Yamamoto, *University of Tokyo, Japan*

**Theme 2. Biomedical Imaging and Image Processing**
    **Chair**
        Marius Linguraru, *George Washington University, USA*
    **Co-Chairs**
        Jong Chul Ye, *KAIST, Korea*
        Chulhong Kim, *POSTECH, Korea*
        Qingming Luo, *Huazhong University of Science and Technology, China*

**Theme 3. Micro- and Nano-Bioengineering; Cellular and Tissue Engineering**
    **Chair**
        Esmaiel Jabbari, *University of South Carolina, USA*
    **Co-Chairs**
        Sung Yang, *GIST, Korea*
        Zhong-Ze Gu, *Southeast University, China*
        Soo-Hong Lee, *CHA University, Korea*

**Theme 4. Computational Systems and Synthetic Biology; Multiscale Modeling**
    **Chair**
        Socrates Dokos, *University of New South Wales, Australia*
    **Co-Chairs**
        Eun Bo Shim, *Kangwon National University, Korea*
        Zuhong Lu, *Peking University, China*
        Jie Liang, *Simon Fraser University, Canada*

**Theme 5. Cardiovascular and Respiratory Systems Engineering**
    **Chair**
        Thomas Heldt, *MIT, USA*
    **Co-Chairs**
        Youngjoon Chee, *University of Ulsan, Korea*
        Yubo Fan, *Beihang University, China*
        Masaru Sugimachi, *National Cerebral and Cardiovascular Center Research Institute (NCVC), Japan*

**Theme 6. Neural Engineering, Neuromuscular Systems and Rehabilitation Engineering**
    **Chair**
        Silvestro Micera, *Ecole Politechnique Federale de Lausanne, France*
    **Co-Chairs**
        Inchan Youn, *KIST, Korea*
        Guanglin Li, *Shenzhen CAS, China*
        David Guiraud, *LIRMM, France*

## Theme 7. Wearable Biomedical Sensors and Systems
**Chair**
Steffen Leonhardt, *RWTH Aachen University, Germany*
**Co-Chairs**
Ki Chon, *University of Connecticut, USA*
Li-Rong Zheng, *Fudan University, China*
Toshiyo Tamura, *Waseda University, Japan*

## Theme 8. Bio-Robotics, Surgical Planning and Biomechanics
**Chair**
Alicia Casals, *Technical University of Catalonia, Spain*
**Co-Chairs**
Jung-Woog Shin, *Inje University, Korea*
Jaesoon Choi, *Asan Medical Center, Korea*
Max Meng, *CUHK, Hong Kong*

## Theme 9. Therapeutic and Diagnostic Systems, Devices and Technologies, Clinical Engineering
**Chair**
Punit Prakash, *Kansas State University, USA*
**Co-Chairs**
Jong Bum Seo, *Yonsei University, Korea*
Lisa Xu, *Shanghai Jiao Tong University, China*
Dieter Haemmerich, *Medical University of South Carolina, USA*

## Theme 10. Biomedical and Health Informatics
**Chair**
May Wang, *GeorgiaTech, USA*
**Co-Chairs**
Wan-Young Chung, *Pukyoung National University, Korea*
Tomohiro Kuroda, *Kyoto University, Japan*
Mark van Gils, *VTT Technical Research Centre, Finland*

## Theme 11. Biomedical Engineering Education and Society
**Chair**
Metin Akay, *University of Houston, USA*
**Co-Chairs**
Beop-Min Kim, *Korea University, Korea*
Hui Ma Shenzhen, *Tsinghua University, China*
Christopher James, *University of Warwick, UK*

## Theme 12. Translational Engineering for Healthcare Innovation and Commercialization
**Chair**
Atam Dhawan, *NJIT, USA*
**Co-Chairs**
Young Huh, *KEIT, Korea*
Min-Xi Wan, *Xian Jiao Tong University, China*
Dorin Panescu, *Intuitive Surgical, Inc, USA*

## Theme 13. Pharmaceutical Engineering and Drug Delivery Systems
**Chair**
Kyungsoo Park, *Yonsei University*, Korea
**Co-Chairs**
Lintao Cai, *Shenzhen Institute of Advanced Technology, China*
Russell Wada, *Certara, USA*

# Program at a Glance

**Tuesday, July 11, 2017**

| | |
|---|---|
| 08:30-12:30 | Workshop & Tutorials |
| 12:30-13:30 | Break |
| 13:30-17:30 | Workshop & Tutorials |

**Wednesday, July 12, 2017**

| | |
|---|---|
| 08:00-09:30 | Oral, Mini, Special, and Invited Sessions |
| 09:30-09:40 | Break |
| 09:40-10:30 | Theme Keynote |
| 10:30-10:50 | Coffee Break |
| 10:50-12:20 | Opening Ceremony & Plenary Talk |
| 12:20-13:20 | Lunch |
| 13:20-14:10 | Plenary Keynote |
| 14:10-14:20 | Break |
| 14:20-15:50 | Oral, Mini, and Invited Sessions |
| 15:50-16:10 | Coffee Break |
| 16:10-17:10 | Ignite Sessions |
| 17:10-17:20 | Break |
| 17:20-18:50 | Poster Sessions |
| 19:00-20:30 | Welcome Reception |

**Thursday, July 13, 2017**

| | |
|---|---|
| 08:00-09:30 | Oral, Mini, Special and Invited Sessions |
| 09:30-09:40 | Break |
| 09:40-10:30 | Plenary Keynote |
| 10:30-10:50 | Coffee Break |
| 10:50-12:20 | Oral, Mini, and Invited Sessions |
| 12:20-13:20 | Lunch |
| 13:20-14:10 | Plenary Keynote |
| 14:10-14:20 | Break |
| 14:20-15:50 | Theme Keynote, Oral, Mini, Special and Invited Sessions |
| 15:50-16:10 | Coffee Break |
| 16:10-17:10 | Ignite Sessions |
| 17:10-17:20 | Break |
| 17:20-18:50 | Poster Sessions |

## Friday, July 14, 2017

| | |
|---|---|
| 08:00-09:30 | Oral, Mini, Special and Invited Sessions |
| 09:30-09:40 | Break |
| 09:40-10:30 | Plenary Keynote |
| 10:30-10:50 | Coffee Break |
| 10:50-12:20 | Oral, Mini, Special and Invited Sessions |
| 12:20-13:20 | Lunch |
| 13:20-14:10 | Plenary Keynote |
| 14:10-14:20 | Break |
| 14:20-15:50 | Oral, Mini, Special and Invited Sessions |
| 15:50-16:10 | Coffee Break |
| 16:10-17:10 | Ignite Sessions |
| 17:10-17:20 | Break |
| 17:20-18:50 | Poster Sessions |

## Saturday, July 15, 2017

| | |
|---|---|
| 08:00-09:30 | Oral, Mini, Special and Invited Sessions |
| 09:30-09:40 | Break |
| 09:40-10:30 | Theme Keynote |
| 10:30-10:50 | Coffee Break |
| 10:50-12:20 | Oral and Mini Sessions |
| 12:20-13:20 | Lunch |
| 13:20-14:10 | Theme Keynote |
| 14:10–14:20 | Break |
| 14:20 – 15:50 | Oral and Mini Sessions |

# Workshops and Tutorials

**Full-day**
**Design Challenge Workshop**
08:30-12:30 / 13:30-17:30
Location: Cho Room
*Registration Required*

## Organizers

- Bruce Hecht, MASc, CSSBB – IEEE Senior Member, EMBS Industry/Practitioner Liaison
- Ayesha Khalid, MD, MBA – IEEE Member
- Alan Zack, BSJ, MBA and Yaniv Snir, BA, MS

## Abstract

Emerging challenges and opportunities are enabled through new technologies and design in the field of biomedical engineering.

Participants will be challenged to employ and develop some of the most important skills required by leaders: creativity, business acumen, social responsibility, communication, and teamwork.

Join us this at the IEEE EMBC Conference 2017, for the Design Challenge Workshop.

**Goals:** The Workshop is designed to deliver a program that:

- Inspires young visionaries from around the world by firing up their competitive spirit;
- Catalyzes innovation
- Cultivates impact through creative solutions to some of the world's biggest health-related challenges
- Teach young innovators about the power of competitions to solve some of the world's biggest problems
- Supports the theme of the 39th Annual International Conference of the EMBC to develop Smarter Technologies for a Healthier World.

**Objective:** Develop a Workshop that can lay the groundwork for an annual competition that is awarded during the annual EMBS International Conferences. The program will activate EMBS's younger network to direct their passion, leadership, and entrepreneurial spirit toward solving challenges in biomedical engineering. Participants will be challenged to employ and develop some of the most important skills required by leaders: creativity, business acumen, social responsibility, communication, and teamwork.

## Specific Approach

During the Conference

- Facilitate a full-day Workshop during the 39th Annual International Conference for students interested in learning about competitions, and designing a competition on a topic about which they are passionate
- The Workshop will begin with a short talk from three experts already in attendance at the conference. The experts will speak for 20-30 minutes, to highlight examples of the biggest challenges and opportunities in the field of biomedical engineering
- Following the talks, a short brainstorming exercise will identify specific challenges in the biomedical engineering space
- Challenges will be designed during the Workshop for development at regional and international events following the conference
- Over the course of the following 3-5 months, students will refine the Challenge (for example, augmenting it based on further primary and secondary research)
- Students will create a 3-minute video that translates their competition into video format most effectively is of high quality content; and communicates scientific research in the most compelling, entertaining, and creative manner
- The videos will be judged by an expert panel, who will be tasked with identifying the competition that demonstrates the greatest feasibility, creativity, need, and that is likely to produce the intended competition's results.
- The winning competition will be further refined, and then launched during the 40th International Conference in Hawaii, 2018.

**Half-day**

**Magnetic Resonance Electrical Impedance Tomography and Electric Properties Tomography: New Insights and Frontiers in Measurement of Tissue Electromagnetic Properties**

08:30-12:30

Location: Park Room

*Registration Required*

## Organizers

- Rosalind Sadleir -IEEE Member, EMBS Member
- Atul Singh Minhas –IEEE Member, EMBS Member

## Speakers

- Hyung Joong Kim, Kyung Hee University
- Munish Chauhan, Arizona State University
- Aditya K. Kasinadhuni
- Atul S Minhas, University of Liverpool
- Rosalind Sadleir, Arizona State University

## Abstract

Tissue electrical conductivity imaging is emerging as a popular and challenging application of MRI techniques. One MR based conductivity imaging technique, Magnetic Resonance Electrical Impedance Tomography (MREIT) has been extensively tested in phantoms and animals. However, the need for external imaging currents has hindered its acceptance in clinical diagnosis applications. Researchers working in this field are now proposing several new approaches with direct clinical significance. Neuromodulation technniques such as transcranial DC or AC stimulation (tDCS/tACS) are naturally suited to MREIT imaging, and its use to image these current flows in the brain has led to new approaches to mechanisms and practice. Conductivity can also be imaged without using current via Electric Properties Tomography (EPT) and Conductivity Tensor Imaging (CTI). Functional neuroimaging may also be possible using MREIT approaches. Development and validation of these techniques in high field scanners requires specialized phantoms suitable for ulta-high magnetic fields. The aim of this workshop is to address the challenges involved in tissue electrical conductivity imaging on these multiple exciting frontiers. The technical focus of the workshop includes numerical methods for MREIT, MRI phase imaging, image data analysis and processing techniques, multi-physics modelling and simulation in MRI, and pulse sequence design for MREIT. The audience will learn how to setup an electrical conductivity imaging experiment, pulse sequences required and data processing methods.

**Half-day**

**Healthcare Revolution through Wearable Electronics**

13:30-17:30

Location: Park Room

*Registration Required*

## Organizers

- Hammad M. Cheema-IEEE Member

## Speakers

- Hammad M. Cheema, National University of Sciences and Technology, Islamabad, Pakistan
- Hassan Aqeel Khan, National University of Sciences and Technology, Islamabad, Pakistan

## Abstract

The first part of the tutorial will introduce wearable electronics domain and the impact it has had in the healthcare realm. Starting from fitness trackers, to smart watches to diagnostic devices, healthcare has witnessed a drastic change in the western countries where ambulatory monitoring is being preferred over in-hospital checkups thus reducing the healthcare costs. In addition, continuous gathering of data is helping physicians and medical scientists to get insight into information which was never available before. The tutorial will also present the basic building blocks which are typically used to develop health centric wearable electronics. The second part of this tutorial will cover Machine Learning and Data analytics techniques for handling wearable sensors. Participants will be provided an overview of how to analyze high-dimensional time-series data using Machine Learning and Pattern Recognition techniques. Special emphasis will be given to feature extraction frontend and participants will learn how to construct and design novel features from data. Different classifiers such as Support Vector Machines and Deep

Neural Networks will also be covered. Participants will also be provided hands-on experience on at least one dataset. Aims and learning objectives: The aims and learning objectives of the tutorial are as follows:

- To share the history of wearable electronics
- To discuss the impact of wearable electronics in healthcare
- To share few case-studies of products/projects in this domain
- To share technological enablers for wearable electronics
- To highlight the future trends in healthcare wearables
- To provide an introduction the basic concepts of machine learning
- To discuss the various parameters and tradeoffs that need to be considered during wearable data analytics
- To provide hands-on exposure to Machine Learning and Data analytic tools for processing wearable sensor data

**Half-day**
**Assessment of Consciousness and will Powered Motor Rehabilitation**
08:30-12:30
Location: Min Room
*Registration Required*

**Organizers**

- Günter Edlinger IEEE, EMBS Member
- Christoph Guger

**Speakers**

- Guenter Edlinger, Guger Technologies OG & g.tec medical engineering GmbH
- Christoph Guger, Guger Technologies OG & g.tec medical engineering GmbH

**Abstract**

The Brain-Machine/Computer Interface (BCI) research area is a vital and fast expanding field. BCIs have been developed during the last years for people with severe disabilities to improve their quality of life. including tools to help patients with disorders of consciousness (DOC) as well as to improve stroke recovery. Imagine being able to think, hear, and feel - but not to move or communicate. More than 40% of patients diagnosed as vegetative are reclassified as (at least) minimally conscious when assessed by expert teams. A further subset of potentially communicative non-responsive patients might be undetectable through standard clinical testing. One part of the workshop will give an overview over groups that aim to use BCI technology to identify non-responsive patients that might be able to communicate and will introduce state-of-the-art technology for advanced consciousness assessment. Recently BCI applications have been also used for rehabilitation after stroke based on motor imagery. Several articles have shown that MI-based BCIs can induce neural plasticity and thus serve as an important tool to enhance motor rehabilitation for stroke patients. This part of the workshop is discussing the application of BCI technology for improved stroke recovery by activating the sensorimotor cortex. This activation is translated into control signals for rehabilitation devices like Virtual Reality environments showing moving limbs of avatars, robotic devices attached to the patient's paralyzed limbs such as exoskeletons, or functional electrical stimulation. The workshop will discuss necessary prerequisites to successfully perform BCI experiments in non-invasive and invasive ways as well as pros and cons of the various methods. Demonstrations of BCI control will allow to understand the progress of the technology. We will invite audience members to participate in live demonstrations, providing real-world examples of modern BCI performance in field settings.

**Remarks**

The tutorial will include next to theoretical background and recent results practical demonstrations of applications

- insights into the BCI technology for stroke rehabilitation and assessment of consciousness enabling participants to
- participate in practical experiments
- giving participants the chance to analyze their BCI performance

**Half-day**
**IEEE Standardization Development for Cuffless and Continuous Blood Pressure Monitoring**
13:30-17:30
Location: Min Room
*Registration Required*

## Organizers

- Proposer - Carole C. Carey, IEEE Senior Member, EMBS Member
- Proposer - Xiao-Rong Ding, IEEE Member, EMBS Member

## Speakers

- Carole C. Carey, IEEE Standard Association
- Yuan-Ting Zhang, Editor-in-Chief for IEEE Reviews in Biomedical Engineering
- Kwang Suk Park, Seoul National University
- Jens Muehlsteff, Philips Research Europe
- Toshiyo Tamura, Osaka Electro-Communication University
- Alberto Avolio, Macquarie University, Sydney, AUSTRALIA

## Abstract

Accurate measurement of blood pressure (BP) is necessary for proper diagnosis and precise cardiovascular risk assessment, as well as to gauge the necessity for intervention and to monitor treatment effect. Current standards to evaluate the clinical performance of BP monitors target mostly cuff-based devices that provide a snapshot of BP. These standards include those established by the Association for the Advancement of Medical Instrumentation (AAMI), the British Hypertension Society (BHS), and the European Society of Hypertension (ESH). A recent standard, IEEE Std 1708TM-2014, was published for wearable, cuffless BP measuring devices that have different modes of operation (e.g. to measure short-term, long-term, snapshot, continuous, beat-to-beat). It should be noted that the standard is limited to evaluation of devices that do not use a cuff during measurement. However, issues such as the induction of dynamic change remains to be clarified. On the other hand, the performance assessment of systems that provide continuous measurement tends to be inconclusive, and acomparison of the outcome of different studies is difficult. It is therefore desirable to develop standard for continuous BP monitoring system.

In the year immediately after the 200th birth anniversary of Carl Ludwig, we propose this workshop to honor Ludwig as the pioneer of continuous blood pressure recording. The primary goal of this workshop is to provide biomedical engineers with an overview of the recent published IEEE 1708 standard with the discussion on further extension and refinement. This workshop will also attempt to introduce standard to evaluate the performance of continuous BP monitoring systems.

**Full-day**
**Deep Audio, Speech and Biosignal Sensing for mHealth and Biomonitoring in Two Nutshells**
08:30-12:30 / 13:30-17:30
Location: Lee Room
*Registration Required*

## Organizers

- Björn W. Schuller – Senior Member IEEE
- Nicholas Cummins – Member IEEE

## Speakers

- A. Björn W. Schuller
- B. Nicholas Cummins

## Abstract

With an aging population and ever-increasing health costs, technologies such as smart phones and wearable devices and advances in AI are currently transforming health care. The combination of passive, non-invasive and non-intrusive smart monitoring technologies together with the robust analysis attainable by deep learning means that remote, cost efficient, automated, and objective diagnosis and monitoring of manifold health states is now accessible to the broad public – everywhere and anytime. Speech analysis, for example, has matured to a new form of active and passive remote sensing technology for a broad range of health conditions and wellbeing. Conditions such as depressive disorders, post-traumatic stress, Alzheimer's and Parkinson's disease and

dementia are detectable, at accuracies approaching clinical utility, via speech analysis. Beyond, earlier pre-diagnosis of epilepsy seizures, or even Rett-Syndrome, Fragile X, and other neurodevelopmental conditions have become feasible. Sleep Apnea, Eating and Alcohol Consumption Behaviour, or Voice Disorder can be continuously monitored, and correctional feedback and aid can now be given to individuals, e.g., on the Autism spectrum "on the go". This tutorial is an introduction to audio and biosignal sensing "in the wild" for mHealth and will comprise of two main sections: first, an overview of the topic covering, data collection, feature extraction and relevant recent machine learning principles as well as a discussion on the key research problems and challenges including data protection and ethics; second, a hands-on session: attendees will receive training on running open-source established feature extraction and machine learning toolkits, including the state-of-the-art openSMILE and novel openXBOW multisensorial feature extraction software. The tutorial will cater for both established and new researchers to this field. By attending, participants will gain key insights and understandings and be able produce publishable systems and results in this fascinating, practical, and rapidly growing field of intelligent signal processing in health and biology.

**Half-day**
**Structural and Functional Imaging with Optical Coherence Tomography and Optical Coherence Elastography**
08:30-12:30
Location: Zworykin Room
*Registration Required*

### Organizers

- Kirill V. Larin-IEEE, EMBS Member

### Speakers

- Kirill V. Larin, University of Houston

### Abstract

This tutorial will overview recent advances in development and application of optical imaging techniques for structural and functional imaging and sensing of various transport, developmental, and disease progression in tissues and cells. Special emphasis will be devoted to theory and applications of novel imaging/sensing modality – Optical coherence Tomography (OCT) and Optical Coherence Elastography (OCE). This tutorial will start with basic description of light-tissue interaction including structural and optical models of tissues with single and multiple scattering. It will be shown that light reflection, transmission, scattering, and state of polarization can be effectively controlled by changes of tissue structure and the refractive index of tissue components. Many examples of OCT noninvasive sensing will be provided such as cardiovascular imaging, ophthalmic applications, monitoring of drug diffusion and optical clearing, sensing and quantifying of microbubbles and nanoparticles in tissues and blood, imaging of early embryonic cardiovascular system development, and, the newest hot topic -- assessing mechanical properties of tissues and cells. Intended Audience: Engineers, scientists and physicians who are interested in learning optical imaging and spectroscopy, laser methods, instruments design, and application for medical science and clinics will find this course useful.

**Half-day**
**Neurophotonics: Imaging and Manipulating the Brain**
13:30-17:30
Location: Zworykin Room
*Registration Required*

### Organizers

- Euiheon Chung, PhD, Dept. Biomedical Sci. & Eng., Gwangju Institute of Science and Technology
- Jung-Hoon Park, PhD, Dept. of Biomedical Eng., Ulsan National Institute of Science and Technology

### Speakers

- Euiheon Chung, PhD, Dept. Biomedical Sci. & Eng., Gwangju Institute of Science and Technology
- Anna W. Roe, PhD, Interdisciplinary Institute of Neuroscience and Technology, Zhejiang University, Hangzhou, P.R. China
- Shih-Chi Chen, PhD, Dept. Mechanical and Automation Eng., The Chinese University of Hong Kong
- Jung-Hoon Park, PhD, Dept. of Biomedical Eng., Ulsan National Institute of Science and Technology
- YongKeun Park, PhD, Dept. of Physics, Korea Advanced Institute of Science and Technology
- Kai Wang, PhD, Institute of Neuroscience, Chinese Academy of Science, Shanghai

## Abstract

Recent advances in optical imaging have proven to be a powerful workhorse for new discoveries in neuroscience. Various contrast mechanisms based on light-matter interaction have enabled structural and functional neuroimaging with diverse animal models. However, compelling study of the brain awaits breakthroughs in many different aspects. For functional imaging at the level of neural circuits, high resolution large field of view imaging at high sampling rates is required. For deep brain imaging, multiple scattering of light becomes the biggest obstacle. For structural imaging of whole brains, aka the connectome, automation of a high-resolution, robust sequential imaging system is required. The large data sets that are obtained in these newly developed high throughput systems also require new data storage and processing schemes that were not previously anticipated. This workshop brings together the latest advances in various areas of neurophotonics with a common goal: imaging and manipulating the brain. This workshop will provide a platform to foster sharing and collaboration in this vibrant research arena.

## Full-day

### Smarter Photoacoustic Imaging: Systems, Applications, and Agents

08:30-12:30 / 13:30-17:30
Location: Herrick Room
*Registration Required*

### Organizers

- Chulhong Kim, Ph.D., IEEE Senior Member, EMBS Member
- Liang Song, Ph.D., The Institute of Biomedical and Health Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences
- Yoshifumi Saijo, M.D. and Ph.D., Graduate School of Biomedical Engineering, Tohoku University
- Junjie Yao, Ph.D., Biomedical Engineering, Duke University

### Speakers

- Chulhong Kim, Ph.D., Creative IT Engineering, Pohang University of Science and Technology
- Liang Song, Ph.D., The Institute of Biomedical and Health Engineering, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences
- Yoshifumi Saijo, M.D, Ph.D., Graduate School of Biomedical Engineering, Tohoku University
- Junjie Yao, Ph.D., Biomedical Engineering, Duke University
- Miya Ishihara, Ph.D.
- Tsuyoshi Shiina, Ph.D.
- Pai-Chi Li, Ph.D., Electrical Engineering and Computer Science, National Taiwan University
- Kang Kim, Ph.D.
- Pramanik Manojit, Ph.D.
- Jonathan Lovell, Ph.D., Biomedical Engineering, University at Buffalo
- Jun Xia, Ph.D.
- Wiendelt Steenbergen, Ph.D.

## Abstract

High-resolution volumetric optical imaging modalities, such as confocal microscopy, two-photon microscopy, and optical coherence tomography, are growing in their importance for biological and medical imaging. However, due to strong light scattering, the penetration depth of optical imaging is limited to the transport mean free path of photons in biological tissues (~1 mm). Photoacoustic imaging, an emerging hybrid modality that can provide strong endogenous and exogenous optical absorption contrasts, has overcome the fundamental depth limitation of optical imaging by maintaining excellent spatio-temporal resolution representative of ultrasound imaging. The image resolution, as well as the maximum imaging depth, is scalable with ultrasonic frequency within the reach of diffuse photons. In biological tissues the imaging depth can be up to a few centimeters. Furthermore, photoacoustic imaging can noninvasively deliver anatomical (i.e., vascular structures, solid tumors and angiogenesis, and internal organs), functional (i.e., total hemoglobin concentration, hemoglobin oxygen saturation, blood flow, pH, and metabolic rate of oxygen consumption), and molecular information from living tissues. For highly sensitive molecular photoacoustic imaging, a valuable tool for personalized medicine, exogenous contrast agents (e.g., organic dyes, metallic and nonmetallic nanoparticles, reporter genes, or fluorescence proteins) with biomarkers are commonly utilized.

In this one-day Workshop, the following topics will be discussed; (1) multi-scale photoacoustic imaging systems, (2) re-clinical imaging of morphology, function, and reporter molecules, (3) clinical applications, and (4) commercial opportunities.

Half-day
**Models and Algorithms for Analysis of Large-Scale Biological Networks**
08:30-12:30
Location: Schwan Room
*Registration Required*

## Organizers

- Prof. Byung-Jun Yoon (Texas A&M University, IEEE Senior Member)
- Prof. Xiaoning Qian (Texas A&M University, IEEE Member)

## Speakers

- Prof. Byung-Jun Yoon, Texas A&M University, Department of Electrical & Computer Engineering TEES-AgriLife Joint Center for Bioinformatics and Genomic Systems Engineering (CBGSE)
- Prof. Xiaoning Qian, Texas A&M University, Department of Electrical & Computer Engineering TEES-AgriLife Joint Center for Bioinformatics and Genomic Systems Engineering (CBGSE)

## Abstract

Recent advances in high-throughput techniques for measuring molecular interactions and the development of text-mining techniques for crawling the vast biomedical literature to collect known molecular interactions have led to the emergence of large-scale biological networks. These networks provide valuable resources that enable systematic genome-scale studies of biological interactions, which may unveil important insights on the structure and functional organization of biological networks and lead to the detection of novel network modules. The proposed tutorial consists of two parts. In the first part of the tutorial, we will present probabilistic models for comparative analysis of large-scale biological networks and introduce efficient algorithms for network alignment and network querying. In the second part of the tutorial, we will go over the concept of network clustering and network community detection and present effective computational methods for accurate identification of functional network modules in biological networks.

Half-day
**The Fast-Changing Landscape of Electroencephalography**
13:30-17:30
Location: Schwan Room
*Registration Required*

## Organizers

- Walter G. Besio - IEEE Member

## Speakers

- Günter Edlinger; MSc. PhD, CEO, g.tec medical engineering GmbH and Guger technologies OG
- Nicola Soldati Ph.D., Brain Products GmbH
- Walter Besio, Ph.D.,CEO, CREmedical Corp. and University of Rhode Island
- Brett Denaro, Ph.D, BioPac Systems

## Abstract

This workshop is designed to give both novice and experienced electroencephalography (EEG) users a synopsis of the latest innovations in EEG and related areas. EEG is the recording of brain electrical activity from the scalp. The EEG measures the difference in potentials between electrodes generated by ionic currents flowing within neurons of the brain. For many years EEG has had limited use due to poor signal quality, low spatial resolution, and non-portability. Even with these limitations EEG is still a standard practice in clinical settings such as diagnosis of epilepsy and for research such as brain computer interfacing. In recent years electrodes, signal acquisition hardware, and signal processing software have undergone major improvements allowing new and improved applications of EEG. We will have talks and demos from four groups on their latest technologies for acquiring and processing the EEG which are making the use of EEG more practical. The target audience of the workshop is the whole community of the IEEE EMBS Society interested in brain research.

**Full-day**
**A Hands-on Approach to Neural Connectivity Inference Methods**
08:30-12:30 / 13:30-17:30
Location: Plonsey Room
*Registration Required*

### Organizers

- Luiz A. Baccalá -IEEE Member - EMBS TC BSP Member
- Koichi Sameshima - IEEE Member - EMBS TC BSP Member
- Laura Astolfi - IEEE EMBS Member- EMBS TC BSP Chair

### Speakers

- Mingzhou Ding, University of Florida, United States
- Koichi Sameshima, University of Sao Paulo, Brazil
- Luiz A. Baccalá, University of São Paulo, Brazil
- Laura Astolfi, University of Rome Sapienza, Italy

### Abstract

The workshop intends to provide a hands-on learning opportunity. In addition to examining in detail conceptual aspects associated to connectivity estimation from neuroelectrical and hemodynamic data we intend to shorten the learning curve of potential users of connectivity analysis software in regard to inferential aspects and the possible caveats and pitfalls the user may encounter. The full day of activity will consist of short morning overview talks, addressing the basic principles, methodological issues, caveat and pitfalls, and examples of application of the software to real data followed by an afternoon devoted to software use and one-to-one discussion with attendees who will have the opportunity to process workshop examples and their own data by bringing their own laptops. This will enable them to benefit from discussing their results and modelling diagnostics with the workshop experts. Attendees must bring Matlab/Octave if they wish to take part in the practical activities. Information about previous workshop editions together with software and further workshop details will be made available at http://www.lcs.poli.usp.br/~baccala/pdc/handson/.

**Full-day**
**Current and Future Challenges in Robotics Research for Biomedical Applications**
08:30-12:30 / 13:30-17:30
Location: Schmitt Room
*Registration Required*

### Organizers

- Prof. Sohee Kim (IEEE-EMBC Member)
- Prof. Cheol Song

### Speakers

- Cheol Song, DGIST
- Jaesoon Choi, Asan Medical Center / University of Ulsan College of Medicine
- Iulian Iordachita, Johns Hopkins University
- Jonghyun Kim, DGIST
- Sang Wook Lee, Catholic University of America
- Sehoon Oh, DGIST
- Hieyong Jeong, Osaka University
- Sukho Park, DGIST
- Wei Wang, Institute of Microelectronics, Peking University
- Kyung-In Jang, DGIST
- Jae-Woong Jeong, University of Colorado at Boulder
- Sohee Kim, DGIST
- Florian Solzbacher, University of Utah

## Abstract

In this workshop, diverse cutting-edge research topics in robotics for medical and biomedical applications will be discussed. Medical robotics is one of the fascinating multidisciplinary fields that combine mechanical, electrical and electronics engineering, computer science, and mechatronics. The goal of this workshop is to bring together the researchers from robotics engineering community and from medical community who are interested in the state-of-the-art research trends and advances in robotics technologies for medical uses. Current research efforts toward next-generation medical robotics technologies will be overviewed by international researchers, in two sessions of macro-scale robotics and micro-scale robotics. In macro-scale, surgical robotics such as ultra-high precision surgical systems and robot-assisted surgery, rehabilitation robots and sport training robotic systems will be presented. In micro-scale, bio-integrated and bio-hybrid robotics such as microrobots, wearable and implantable sensors and systems driven by advances in nano- and micro-electro-mechanical system (MEMS) technologies will be presented, which will be directed toward the integration of biological systems and robotic systems. It will be a unique platform to overview diverse robotics research for medical applications in macro-scale as well as in micro-scale.

# Minisymposia

| Title | Organizers | Where & When |
|---|---|---|
| Recent Progress in Biosignal-Based Human-Computer Interaction | Chang-Hwan Im* Han-Jeong Hwang | Wednesday July 12, 2017 08:00-09:30 Roentgen Hall |
| Emerging Methods in Medical Image Analysis | Hiroshi Fujita Gobert Lee* (Australia) | Wednesday July 12, 2017 08:00-09:30 Schaldach Room |
| Bioimpedance in Biomedical Applications and Research: Concepts | Pedro Bertemes-filho | Wednesday July 12, 2017 08:00-09:30 Rushmer Room |
| Recent Advances on Image-Guided Devices and Therapies | Lisa Xuemin Xu* Brian Fowlkes | Wednesday July 12, 2017 08:00-09:30 Cho Room |
| Next Generation Intravascular Imaging I | Hongki Yoo, Hanyang University, Seoul, South Korea | Wednesday July 12, 2017 08:00-09:30 Park Room |
| Recent Advances in Neural Stimulation for Cortical Neural Interfaces | Shelley Fried* (USA) | Wednesday July 12, 2017 08:00-09:30 Plonsey Room |
| Brain Signal Processing for Brain-Computer Interfaces (BCIs) | Sung-Phil Kim* (Korea, South) | Wednesday July 12, 2017 14:20-15:50 Roentgen Hall |
| Next Generation Intravascular Imaging II | Hongki Yoo, Hanyang University, Seoul, South Korea | Wednesday July 12, 2017 14:20-15:50 Park Room |
| Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea I | Michael Khoo* Thomas Penzel (USA) | Thursday July 13, 2017 08:00-09:30 Webster Room |
| Current Advances in Seismocardiography and Ballistocardiography | Kouhyar Tavakolian* Marco Di Rienzo (USA) | Thursday July 13, 2017 08:00-09:30 Lee Room |
| Challenges in the Restoration of Vision through Retinal Neurostimulation | Yasin Dhaher Keith Gordon (USA) | Thursday July 13, 2017 08:00-09:30 Plonsey Room |
| Neural Hyperscanning: Toward Multiple-Brain Models of Cognitive Functions | Laura Astolfi Mingzhou Ding (Italy) | Thursday July 13, 2017 10:50-12:20 Roentgen Hall |

# Minisymposia

| Title | Organizers | Where & When |
|---|---|---|
| Authentication using Biological Signals | Kwang S. Park<br>Jason Kim*<br>(Korea, South) | Thursday<br>July 13, 2017<br>10:50-12:20<br>Schmitt Room |
| Recent Advances on Cuffless Blood Pressure Measurement Technology I | Jin-Oh Hahn<br>Omer Inan<br>(USA) | Thursday<br>July 13, 2017<br>10:50-12:20<br>Greatbatch Room |
| Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea II | Michael Khoo*<br>Thomas Penzel<br>(USA) | Thursday<br>July 13, 2017<br>10:50-12:20<br>Webster Room |
| Radiation Induced Acoustic Imaging | Jung-Joon Min*<br>Changho Lee<br>Chulhong Kim<br>(Korea, South) | Thursday<br>July 13, 2017<br>10:50-12:20<br>Cho Room |
| Emerging Technologies for Cuffless Unobtrusive Blood Pressure Monitoring: Celebration of 200th Birth Anniversary of Carl Ludwig | Carole C. Carey*<br>Xiao-Rong Ding | Thursday<br>July 13, 2017<br>10:50-12:20<br>Lee Room |
| Recent Advances on Cuffless Blood Pressure Measurement Technology II | Ramakrishna Mukkamala<br>Lalit K. Mestha<br>(USA) | Thursday<br>July 13, 2017<br>14:20-15:50<br>Greatbatch Room |
| Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea III (Issues in Therapeutic Modalities for Sleep-Disordered Breathing) | Michael Khoo*<br>Thomas Penzel<br>(USA) | Thursday<br>July 13, 2017<br>14:20-15:50<br>Webster Room |
| Tissue Electromagnetic Property Mapping using Magnetic Resonance Imaging (MRI) | Joonsung Lee*<br>Seung-Kyun Lee<br>Yi Wang<br>Jongho Lee<br>(Korea, South) | Thursday<br>July 13, 2017<br>14:20-15:50<br>Park Room |
| Opportunities and Challenges for Wearable Medical Devices | Sung-Min Park*<br>Kak Namkoong<br>(Korea, South) | Friday<br>July 14, 2017<br>08:00-09:30<br>Lee Room |
| Neural Prosthetic Devices Usable for Animal and Clinical Studies, in Asian Countries | Yuki Hayashida*<br>Kyung Hwan Kim<br>(Japan) | Friday<br>July 14, 2017<br>08:00-09:30<br>Plonsey Room |
| Implementation of Information Technologies for Biomedical Engineering | Chulhong Kim<br>Keiichi Horio<br>(Korea, South) | Friday<br>July 14, 2017<br>10:50-12:20<br>Rushmer Room |
| Rehabilitation Technologies for Neurological Disorders using Neuromodulations | Ning Lan*<br>C. Minos Niu<br>(China) | Friday<br>July 14, 2017<br>10:50-12:20<br>Herrick Room |

# Minisymposia

| Title | Organizers | Where & When |
|---|---|---|
| Contemporary Diagnostic Devices in Traditional Eastern Medicine: Overview of the Research Activities at KIOM | Jaeuk U Kim* (Korea, South) | Friday July 14, 2017 14:20-15:50 Dunn Room |
| Advanced Robotic Surgery based on Deep Tissue Imaging and Haptic Feedback Technology | Chulhong Kim* Wankyun Chung (Korea, South) | Friday July 14, 2017 14:20-15:50 Rushmer Room |
| Frontiers in Wavefront Shaping Techniques | Puxiang Lai* Yongkeun Park (China) | Saturday July 15, 2017 08:00-09:30 Cho Room |
| Destabilizing Locomotor Paradigms: Understanding Motor Adaptations Post Stroke | Yasin Dhaher Keith Gordon (USA) | Saturday July 15, 2017 08:00-09:30 Plonsey Room |
| Bioprinting for Regenerative Medicine Applications | Sungjune Jung Jinah Jang (Korea, South) | Saturday July 15, 2017 10:50-12:20 Aworykin Room |
| TRPM Channels by Multi-hierarchical Analysis: Measurement and Modeling | Xin Zhu (Japan) | Saturday July 15, 2017 14:20-15:50 Greatbatch Room |

# Special Sessions

**Multiscale Biomedical Engineering Systems in Health & Disease**
Wednesday, July 12, 2017, 08:00-09:30
Location: Zworykin Room

## Organizers
- Jungkyu (Jay) Kim, Texas Tech University
- Jennifer H. Shin, KAIST

## Speakers
- **Introduction of Multiscale Biomedical Engineering Systems**

  Hanjoong Jo, Emory

- **Biomimetic Nanomaterials for Targeting Antibiotic Resistant Pathogens**

  Min-Ho Kim, Kent State University

- **Pathomimetic Human Gut Inflammation-on-a-Chip**

  Hyun Jung Kim, The University of Texas at Austin

- **Biomaterials-Based 3D Cell Printing for Next-Generation Therapeutics and Diagnostics**

  Jinah Jang, Postech,

- **Brain/Bio Medical Microsystems**

  Hyunjoo Jenny Lee, KAIST

- **Actin Cytoskeleton Organization in Vitro under Mechanical Stimulation**

  Hyungsuk Lee, Yonsei University,

- **Microfluidic Techniques for Studying Mechanobiology of Valvular Cells**

  Jungkyu (Jay) Kim, Texas Tech University

## Abstract

Biomedical engineering systems are highly multiscale and multidimensional, which are broad and parallel the most advanced developments of disease modeling, diagnosis, and treatment. By discussing the interconnection from cellular to organ levels, we will be able to improve the understanding of both biophysical and biochemical parameters to obtain a big picture of our body system with the considerations of inherent engineering limitations. This session offers several presentations ranging from disease modeling, diagnosis, and treatment based on micro/nanotechnologies enabled platforms for multiscale biomedical engineering approach.

**Recent Progresses in Computed Tomography: From Data Acquisition to Quality Evaluation**
Thursday, July 13, 2017, 08:00-09:30
Location: Park Room

## Organizers
- Seungryong Cho, Associate Professor, Korea Advanced Institute of Science and Technology, Korea

## Speakers
- **Various Scanning Approaches in CT Imaging with Advanced Technologies**

  Seungryong Cho, Assoc. Professor (KAIST, Korea)

- **Algorithm-Enabled Low-Cost C-arm CBCT of High Utility in Image-Guided Interventional Procedures**

  Xiaochuan Pan, Professor (University of Chicago, USA)

- **Deep Learning in CT from Acquisition to Processing**

  Namkug Kim, Asst. Professor (Asan Medical Center, Korea)

- **Task-Based Image Quality Assessment in CT**

  Lifeng Yu, Assoc. Professor (Mayo Clinics, USA)

## Abstract

As technologies advance in both hardware components and software parts in computed tomography, unseen performances at much less radiation dose and applications with richer information are under active exploitation. Innovative sampling techniques, high performance iterative image reconstruction, deep learning based image analysis, and clinical assessment of image quality would be some examples of recent progress in CT. Inviting the leading experts of this field to form a special session would provide a focused opportunity to the speakers to provide an insightful review of the recent advances in the field and to disseminate their seminal findings. The audience would be able to have a time to look back at and forward to the cutting edge technologiesin a well-rounded manner and to participate vigorously in the discussion.

**EMBC/KOptS/KOSOMBE Joint Program - Lutronic Symposium: Issues in Ophthalmology and Vision Sciences**
Thursday, July 13, 2017, 10:50-12:20
Location: Rushmer Room

## Organizers
- Jongmo Seo, IEEE Member

## Speakers
- **Optical Treatment: Cross-linking in Corneal Ectasis**

  Jinkwon Jeong, Department of Ophthalmology, Soonchunhyang University Hospital

- **Laser Treatments in Glaucoma**

  Haksu Kyung, Department of Ophthalmology, National Medical Center (NMC)

- **Beyond Image Quality for Recent Displays**

  Youngkyung Park, Ewha Womans University

- **What can We Measure in the Eye in the Mobile Healthcare Era?**

  Jongmo Seo, Department of Electrical and Computer Engineering, Seoul National University (SNU)

## Abstract

Since the Galileo's finding of the optical properties of human eye and up to the Helmholtz's investigation of optics, ophthalmology and vision sciences have kept on simultaneous progress by exchanging their knowledge intimately. Recent advances of biomedical engineering also accelerates this process, and everybody is accustomed to the up-to-date treatment modalities such as LASIK/EXCIMER laser surgery. Display technologies are also based on the knowledge of the vision science, and the futuristic mobile healthcare would like to adopt many information from the eye. Even though a single session cannot cover all the topics of biomedical engineering side of the ophthalmology and vision sciences, some of the interesting topics will be introduced in this session.

This symposium is provided by the Korean Optometry Society (KOptS) and Korean Society of Medical and Biological Engineering (KOSOMBE)

**NI LabVIEW Hands on Seminar**
Thursday, July 13, 2017, 14:20-15:50
Location: Min Room

## Organizers
- Hangil Cho, National Instruments Korea Technical Marketing

## Speakers
- **NI LabVIEW Hands on Seminar**

  Hangil Cho, National Instruments Korea Technical Marketing

## Abstract

LabVIEW is an integrated development environment designed specifically for engineers and scientists building measurement and control systems. LabVIEW hands on seminar gives you the chance to explore the LabVIEW environment, dataflow programming, and common LabVIEW development techniques in a hands-on format.

**Hospital - Industry Collaborative R & D Program in South Korea**
Friday, July 14, 2017, 08:00-09:30
Location: Dunn Room

## Organizers
- Young Huh, KIET, Korea

## Speakers
- **Biomedical Technology Commercialization: a Value Chain Perspective**

  Shin Cheul Kim, Director of Technology Transfer Office and Managing Director of Versitech Limited, University of Hong Kong

- **R&BD Platform Specialized in Medical Imaging Equipment: SNUBH Experience**

  Hak-Jong Lee, Dept. of Radiology, and Medical Device R&D Center, Seoul National University Bundang Hospital

- **Overcoming the Valley of Death through Medical Device Platforms**

  Kun-Woo Park, Professor of Neurology Korea University Medical Center Director of Korea University Hospital, Medical Device Innovation Center

- **Hospital Based Platform for Development and Marketing of in Vitro Diagnostic Devices**
  Kyung-Ja Han, Dept. of Laboratory Medicine, Seoul St. Mary's Hospital, The Catholic University of Korea

## Abstract

Hospital enterprise linkage has several advantages such as R & D reflecting the hospital needs and participating in product development by the clinician. In addition, it is possible to successfully promote the development of new technology products related to demand for hospitals that can enter the global market and the domestic luxury medical device technology through cooperation research and development. Clinical trial / clinical evaluation through hospital business link is easy for product problem and cause discovery, and product quality competitiveness can be improved through solution support technology. In this session, we will discuss and discuss the hospital based research platform in Korea.

## Standard in Radiological Medicine
Friday, July 14, 2017, 08:00-09:30
Location: Geddes Room

### Organizers
- Young Huh, KEIT, Korea

### Speakers
- **Standard and Radiation therapy**

  Il sung Cho(Staff Researcher), Korea Institution of Radiological & Medcial Sciences

- **Status and Performance Requirements of Boron-Neutron Capture Therapy (BNCT)**

  Young Kyung Lim, Ph.D. (Medical Physicist), National Cancer Center

- **Performance Requirements of Medical Carbon-Ion Accelerator**

  Prof. Dong Wook Kim (Medical Physicist), Kyung Hee University Hospital at GandDong

- **Industry Trends in Nuclear Medicine Scanners**

  Prof. Jung Yeol Yeom, Korea Univ.

### Abstract

Radiation therapy and nuclear medicine combine physics, biology, accelerator engineering and medicine. From early radiation therapy using radioactive isotopes to modern radiology using large accelerators, radiation medicine continues to evolve, absorbing computer control technology and robotic technology based on state-of-the-art technology. In this session, we will discuss the latest trends in radiological equipment and the requirements for safe use of these technologies and discuss how they apply to standard development.

## Current Trends in Standardization of Medical Devices in Traditional Medicine
Friday, July 14, 2017, 10:50-12:20
Location: Dunn Room

### Organizers
- Young Huh, KEIT, Korea

### Speakers
- **Current Trends of Standardization on Medical Devices in Traditional Medicine**

  Sunmi CHOI, Director of KM Standards Center, Korea Institute of Oriental Medicine

- **Standardization on Computerized Tongue Image Analysis System**

  Jihye Kim (Researcher), Keun Ho Kim*, KM Fundamental Research Division, Korea Institute of Oriental Medicine

- **Current Trends and Technologies of Tonometry Radial Pulse Device Standardization**

  HeeJung KANG (CEO), DAEYOMEDI Co., Ltd.

### Abstract

ISO established Technical Committee 249 to develop the international standards in traditional medicine in 2009. The scope of the technical committee is to develop the standards on medicinal herbs and products, medical devices, and terminology and informatics in traditional medicine. Some international standards related to medical devices including acupuncture needles, herbal decoction apparatus, moxibustion devices and intradermal acupuncture needles have been published recently.

**Standard of Dental Devices**
Friday, July 14, 2017, 10:50-12:20
Location: Geddes Room

**Organizers**
- Young Huh, KEIT, Korea

**Speakers**
- **Standards of Biocompatibility Test for Medical & Dental Devices**

  Kwang-Mahn Kim (Professor), Department and Research Institute of Dental Biomaterials and Bioengineering, Yonsei University College of Dentistry

- **New Standards in Dental CAD/CAM**

  Min-Ho Chang (Professor), Korea University, School of Mechanical Engineering

- **Development of International Standards for New Technology in Dentistry**

  Jae-Sung Kwon (Ph.D.) Department and Research Institute of Dental Biomaterials and Bioengineering, Yonsei University College of Dentistry

**Abstract**

As the population ages around the world, interest in oral health is increasing, and the market for various dental medical devices such as implants is growing very rapidly. With the development of oral scanners, 3D printers, materials, software, and IT technology, the paradigm of dental care is changing, and dental instruments with different types of dental instruments or digital technologies are being developed . This session will review the standardized safety assessment methods for safe use of dental materials and medical devices.

**Current Standard Trends for Electromedical Equipments**
Friday, July 14, 2017, 14:20-15:50
Location: Geddes Room

**Organizers**
- Young Huh, KEIT, Korea

**Speakers**
- **Current Standard Trends for Electromedical Equipments**

  Chan Yo Won (CEO), Dt&S Co., Ltd.,

- **Current Trends of Technical Issues and Standards of High Frequency Surgical Equipments and Surgical Laser Equipments**

  Young-Seok SEO (Director of R&D Center), WONTECH Cp., Ltd.,

- **Emerging Trends and Technologies of International Standards on Medical Robots**

  JEON IL Moon (Professor), Daegu Gyeongbuk Institute of Science and Technology(DGIST)

**Abstract**

In the IEC standard, electrical medical devices cover the safety and effectiveness of medical devices that use electricity in the 62nd Technical Committee. This session discusses common risk management practices for standardized medical devices. We will also look at trends in the latest laser surgical instruments and medical robotics technologies and to look at the latest trends in these standards.

Healthcare Innovation: Inspiring Global Open Consensus Standards
Saturday, July 15, 2017, 08:00-09:30
Location: Webster Room

## Organizers

- Carole C. Carey, IEEE Senior Member, EMBS Member

- Young Lae Moon, IEEE Member

- William Ash, IEEE-SA

## Speakers

- **Developing IEEE Interoperability Standards for Personal Health Devices Communications**

  Daidi Zhong, Chongqing University

- **Moving Forward the IEEE Standardization Projects in 3D-Based Medical Device Application – Medical Visualization, Medical Data Management, 3D Simulation, Bio-CAD Format for Medical 3D Printing**

  Young Lae Moon, Chosun University

- **Shaping the Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Technology Roadmap: Challenges and Standardization Needs**

  Yu Yuan, Senses Global Corporation

- **Need of Standards for Brain-Machine Interface Systems and Report on the Industry Connection (IC) Program in Neurotechnologies**

  Ricardo Chavarriaga, Ecole Polytechnique Fédérale de Lausanne

  **Panel Discussion**

- Nigel Lovell, University of New South Wales (UNSW)

- Yuan-Ting Zhang, Chinese University of Hong Kong

- Banu Onaral, Drexel University Philadelphia, PA, USA

## Abstract

Novel technologies, in both medical and consumer devices, generally evolve faster than the development of standards. Rapidly expanding knowledge in science and biomedical engineering has in part led the speed in innovation of new personal and medical health devices. Next generation image-guided systems; advanced non-invasive brain-computer interfaces; wearable health devices for monitoring; and, display visualization techniques are some examples to name a few. IEEE and its standards development arm, the IEEE-SA, draw on the expertise of its technical societies to bring people and technology together. Industry consensus standards are developed in an open process based on input from interested parties worldwide. This session will highlight and provide current standardization information on specific technology areas, such as standards for 3D-based medical device applications, health informatics medical device communication, AR/VR (Augmented Reality, Virtual Reality), and the field of neurotechnologies. The dialogue will provide an opportunity to share best practices, identify additional gaps for future standards development as well as stimulate active involvement to help reduce the lag between technology and availability of standards.

Big Data to Improve Outcomes,Process, and Services in Health
Saturday, July 15, 2017, 08:00-09:30
Location: Schmitt Room

## Organizers
- Metin Akay –IEEE-EMBS Member
- Giuseppe Fico – IEEE-EMBS Member

## Speakers
- **Big Data for Active and Assisted Living**

  Sergio Guillén

- **Knowledge Discovery about Mental Disorders from Multiparametric Data**

  Enzo Pasquale Scilingo.

- **Big Data to Support Active and Healthy Ageing Solutions**

  Maria Teresa Arredondo

- **Cohort Harmonization and Big Data Analytics for Satisfying the Unmet Needs in Sjögren's Syndrome**

  Antonis Sakellarios

- **Big Data to Improve Decision Support in Head and Neck Cancer**

  G. Fico

## Abstract

It is often said about the Big data paradigm that everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims. Nevertheless, the term is currently used in common language. What can be agreed is that when we talk about Big data we are referring to extracting information and knowledge from wide and heterogeneous data sources. In this special session we will share experiences on how knowledge is managed, controlled and generated in different healthcare sectors, like Personalized Medicine (Head&Neck Cancer, Sjögren's disorder), Active and Assisted Living, Public Health Policies and Mental Disorders.

Measurement in Biomedical Research
Saturday, July 15, 2017, 08:00-09:30
Location: Geddes Room

## Organizers
- Chang Geun Kim, Ph.D.
- Wonsik Ahn, M.D.

## Speakers
- **Respiratory Changes in Pulse Oximeter Plethysmography Amplitude in Children**

  Ji-Hyun Lee M.D., Dept. of Anesthesiology and Pain Medicine Seoul National Univsersity Children's Hospital

- **Uncertainty Measurement of Optic Nerve Sheath Diameter using Ultrasound**

  Hyo-Jin Byon, M.D., Department of Anesthesiology and Pain Medicine, Severance Hospital, Yonsei University College of Medicine

- **Thermography with Infrared Thermal Camera**

  Jinyoung Oh, M.D., Department of Anesthesiology and Pain Medicine in Daejeon St. Mary's Hospital

Abstract

Measurement is the basic procedure in most biomedical engineering studies. Therefore, we think we are familiar with measurements and KNOW 'measurements' well. However, the actual situation is the opposite. Most biomedical engineering studies consist of measurements using objective devices. While we use objective devices, the appropriate method of applying the appropriate measuring device can adequately define "measurand" to compare different results. The measurand, traceability, and uncertainty are so important that "Bereau International des Poids et Mesures" (BIPM) has issued several guidelines under the name of "The Joint Committee for Guides in Metrology" (JCGM). These should also be applied to biomedical engineering research. We will present three themes under this principle. They improve the quality of biomedical engineering research.

**Luncheon Symposium 1: EMBC/KOptS/KOSOMBE joint program - Heidelberg/Kisantech Symposium:**
**Advances in Optical Coherence Tomography (OCT) in the field of Ophthalmology and the Clinical Applications**
Thursday, July 13, 2017, 12:20-13:20
Location: Greatbatch Room

Organizers
- Jongmo Seo, IEEE Member

Speakers
- **Advances in Optical Coherence Tomography and the Clinical Applications in retinal diseases**

  Eun Kyoung Lee, Department of Ophthalmology, Jeju National University (JNU)

- **Clinical Applications of Optical Coherence Tomography in Glaucoma**

  Sang-Yoon Lee, Department of Ophthalmology, Jeju National University (JNU)

Abstract

Optical coherence tomography (OCT) is a noninvasive noncontact imaging technology that provides a high-resolution, cross-sectional image of the cornea, retina, retinal nerve fiber layer, choroid, and optic nerve head. Advances in OCT technology have revolutionized the clinical practice of ophthalmology in recent years. It allows detailed visualization of the eye structure on the level of individual cellular layers and provides substantial information about the pathologic changes in microstructures.

This symposium is provided by the Korean Optometry Society (KOptS) and Korean Society of Medical and Biological Engineering (KOSOMBE)

**Luncheon Symposium 2: EMBC/KOptS/KOSOMBE joint program - Carl Zeiss Symposium:**
**Recent Advances in Ophthalmic Laser Surgery**
Thursday, July 13, 2017, 12:20-13:20
Location: Webster Room

Organizers
- Jongmo Seo, IEEE Member

Speakers
- **Principles of various ophthalmic laser**

  Jongmo Seo, Department of Ophthalmology, Seoul Natioal University Hospital (SNUH)

- **Updates of Laser Refractive Surgery**

  Jinho Jeong, Department of Ophthalmology, Jeju National University (JNU)

Abstract

Laser is a crucial technology in the field of ophthalmology, from the diagnosis to the treatment. Optical Coherence Tomography changed the practice of the retina clinic and even change the paradigm of the diagnostic procedure. Laser photocoagulation of the ischemic retina saved the vision of the diabetic patients and the laser ablation of the cornea liberate the myopic patients from the eyeglasses or daily contact lens use. In this symposium, basics of the ophthalmic lasers and the advanced treatment modalities in the ophthalmology will be presented.

This symposium is provided by the Korean Optometry Society (KOptS) and Korean Society of Medical and Biological Engineering (KOSOMBE)

# Invited Sessions

| Title | Organizers | Where & When |
|---|---|---|
| Pharmaceutical Engineering for Smart Drug Delivery Systems | Cai, Lintao-Shenzhen, Institutes of Advanced Technology, Chinese Academy of Sciences | Wednesday July 12, 2017 08:00-09:30 Track T13 Dunn Room |
| Modeling and Estimation of the Respiratory System for Clinical Applications | Chbat, Nicolas W., Center of Excellence in Critical Care Innovation | Wednesday July 12, 2017 08:00-09:30 Track T15 Webster Room |
| Frontiers in Perinatal and Pediatric Imaging | Grisan, Enrico, University of Padova Linguraru, Marius George, Children's National Health System Lepore, Natasha, University of Southern California / Children's Hospital Los Angeles Wang, Yalin, Arizona State University | Wednesday July 12, 2017 14:20-15:50 Track T2 Cho Room |
| Voice Frequency Analysis: Expectation for the Convenient but Powerful Diagnostic Tool for Neuropsychiatric Disorders | Morimoto, Yuji, National Defense Medical College Tokuno, Shinichi Mitsuyoshi, Shunji Shinohara, Shuji Nakamura, Mitsuteru Higuchi, Masakazu, The Univ of Tokyo Omiya, Yasuhiro Hagiwara, Naoki, PST Inc. | Wednesday July 12, 2017 14:20-15:50 Track T10 Schmitt Room |
| Biomedical Applications of Terahertz Imaging and Spectroscopy | MacPherson, Emma, Chinese University of Hong Kong | Thursday July 13, 2017 08:00-09:30 Track T2 Cho Room |
| Modeling of Modern Devices and Technologies with Computational Human Phantoms I | Makarov, Sergey, Electrical and Computer Engineering, Worcester Polytechnic Institute Horner, Marc, ANSYS, Inc. Noetscher, Gregory, Worcester Polytechnic Institute | Thursday July 13, 2017 08:00-09:30 Track T12 Geddes Room |
| Body Sensor Networks Molcules, Radio, and Machine Learning III | Balasingham, Ilangko, Oslo Univ. Hospital and Norwegian Univ. of Science and Tech. Anzai, Daisuke, Nagoya Inst. of Tech. Sugimachi, Masaru, Natl Cardio Center Res. Inst. | Thursday July 13, 2017 08:00-09:30 Track T1 Roentgen Hall |
| Brain and Physiological Networks: Methods and Applications | Faes, Luca, University of Trento Ding, Lei, University of Oklahoma Astolfi, Laura, University of Rome Sapienza | Thursday July 13, 2017 08:00-09:30 Track T1 Roentgen Hall |

# Invited Sessions

| Title | Organizers | Where & When |
|---|---|---|
| Modeling of Modern Devices and Technologies with Computational Human Phantoms II | Makarov, Sergey, Electrical and Computer Engineering, Worcester Polytechnic Institute<br>Horner, Marc, ANSYS, Inc.<br>Noetscher, Gregory, Worcester Polytechnic Institute | Thursday<br>July 13, 2017<br>10:50-12:20<br>Track T12<br>Geddes Room |
| Modeling of Modern Devices and Technologies with Computational Human Phantoms III | Makarov, Sergey, Electrical and Computer Engineering, Worcester Polytechnic Institute<br>Horner, Marc, ANSYS, Inc.<br>Noetscher, Gregory, Worcester Polytechnic Institute | Thursday<br>July 13, 2017<br>14:20-15:50<br>Track T12<br>Geddes Room |
| Signal Processing and Modelling Techniques for Fetal Monitoring | Khandoker, Ahsan Habib, Khalifa University of Science, Technology and Research | Thursday<br>July 13, 2017<br>14:20-15:50<br>Track T17<br>Einthoven Hall |
| Wearable Devices for Cardiovascular Monitoring | Chon, Ki, Univ. of Connecticut<br>Kim, Insoo, Univ. of Connecticut Health Center | Thursday<br>July 13, 2017<br>14:20-15:50<br>Track T5<br>Lee Room |
| Deep Learning in Biomedical Image Analysis | Jeong, Won-Ki, Ulsan National Institute of Science and Technology (UNIST)<br>Ye, Jong Chul, Korea Advanced Inst of Science & Tech | Thursday<br>July 13, 2017<br>14:20-15:50<br>Track T14<br>Schaldach Room |
| Single Protein Sensors and Actuators | LU, Zuhong, Southeast University<br>Chen, Antony, Peking University, College of Engineering | Friday<br>July 14, 2017<br>08:00-09:30<br>Track T6<br>Zworykin Room |
| Body Sensor Networks Molcules, Radio, and Machine Learning I | Balasingham, Ilangko, Oslo Univ. Hospital and Norwegian Univ. of Science and Tech.<br>Anzai, Daisuke, Nagoya Inst. of Tech.<br>Sugimachi, Masaru, Natl Cardio Center Res. Inst. | Friday<br>July 14, 2017<br>08:00-09:30<br>Track T4<br>Min Room |
| Microfluidic Systems for Cell Manipulation and Analysis | Chen, Weiqiang, New York University<br>Lam, Raymond H. W., City University of Hong Kong | Friday<br>July 14, 2017<br>10:50-12:20<br>Track T6<br>Zworykin Room |
| Body sensor Networks Molcules, Radio, and Machine Learning II | Balasingham, Ilangko, Oslo Univ. Hospital and Norwegian Univ. of Science and Tech.<br>Anzai, Daisuke, Nagoya Inst. of Tech.<br>Sugimachi, Masaru, Natl Cardio Center Res. Inst. | Friday<br>July 14, 2017<br>10:50-12:20<br>Track T4<br>Min Room |

# Invited Sessions

| Title | Organizers | Where & When |
|---|---|---|
| Body Sensor Networks Molcules, Radio, and Machine Learning III | Balasingham, Ilangko, Oslo Univ. Hospital and Norwegian Univ. of Science and Tech. <br> Anzai, Daisuke, Nagoya Inst. of Tech. <br> Sugimachi, Masaru, Natl Cardio Center Res. Inst. | Friday <br> July 14, 2017 <br> 14:20-15:50 <br> Track T4 <br> Min Room |
| Biomedical Data Beyond Linear Correlation: Higher Order Statistics and Non-Gaussianity, Non-Linearity and Multifractality | Yamamoto, Yoshiharu, The University of Tokyo <br> Abry, Patrice, ENS Lyon, CNRS | Friday <br> July 14, 2017 <br> 14:20-15:50 <br> Track T18 <br> Montgomery Hall |
| Recent Advances in Ultrasound Medical Imaging | Yoo, Yangmo, Sogang University <br> Kim, Hyung Ham, Pohang University of Science and Technology <br> Managuli, Ravi, Hitachi Aloka Medical America, Inc. | Friday <br> July 14, 2017 <br> 14:20-15:50 <br> Track T2 <br> Cho Room |
| Computational Models of Cardiac Electrophysiology and Mechanics | Shim, Eun Bo, Kangwon National University <br> Leem, Chae Hun, University of Ulsan College of Medicine | Saturday <br> July 15, 2017 <br> 08:00-09:30 <br> Track T11 <br> Greatbatch Room |

# Conference Editorial Board for EMBC 2017, Jeju Island, Korea

I would like to sincerely thank the following members of the Conference Editorial Board. There were 2962 submissions overall. 1451 of these were full-contributed manuscripts that were part of our rigorous peer-review process. These papers were reviewed with on average three reviewers per paper, but a minimum of two. Theme editors also made initial "accept/reject" decisions and created a draft scientific program for each theme.

There were also 124 Invited Sessions and 141 Minisymposia 1 page papers. These were also carefully reviewed by a separate review panel selected by the program committee.

Finally, were also an exciting 901 Research Poster 1 page papers this year. These were reviewed by a special team of associate editors, handpicked by the local organizers and the EMB Technical Committees. I thank all of these individuals for their time as we rapidly reviewed them.

Each year we maintain the highest quality of papers being submitted, each with ratings and feedback given to authors from reviewers. The continued dedication and commitment of Editors, Associate Editors and Reviewers, makes this Annual Conference an active and vibrant community of science. I also want to warmly thank the members of the Editorial Board, listed below, who made my work a real pleasure. It has been an honour and privilege to be part of such a fine community.

*James Patton, Editor in Chief for Conference Editorial Board*

_____

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Bradley, Andrew Peter
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Sultanov, Renat
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Ün, Mustafa Kerem
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Zhu, Xin
Zhu, Yuemin
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Zong, Chengzhi
Zong, Wei
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# Editor's Notes

The 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society hosted an electronic paper submission process for the conference. It was the responsibility of the submitting Author to ensure the document was viewable and without errors that would prevent the Conference from including the paper in Digital Proceedings. In the event a paper was submitted that could not be viewed or printed properly, the Conference elected to only publish the abstract of the paper in the Proceedings.

All conference papers were peer-reviewed by experts chosen by the Conference Editorial Board for all Contributed and Special Session 4 page papers.

# Keynote & Plenary Speakers

## Zhi-Pei Liang, Ph.D.

Breaking the Spatiotemporal Barriers of MR Spectroscopic Imaging:
A Marriage of Spin Physics and Machine Learning for
Label-Free Molecular Imaging

Wednesday, July 12, 2017, 09:40-10:30, Roentgen Hall

### Abstract

Molecular imaging has been a dream of biomedical imaging scientists for decades, and governments and industries around the world have invested billions into this area. However, most existing molecular imaging techniques (e.g., PET and SPECT) require exogenous molecular probes or reporters to be introduced into a subject in order to obtain molecule-specific information, thereby limiting their practical utility. Magnetic resonance spectroscopic imaging (MRSI) has long been recognized as a powerful tool for non-invasive, label-free molecular imaging and a lot of outstanding work has been done over the past three decades, resulting in significant advances in MRSI data acquisition, pulse sequences, data processing, and image reconstruction. However, in spite of these enormous progresses, current MRSI technology still falls short of providing adequate spatial resolution, speed, and signal-to-noise ratio (SNR) for routine clinical and research applications.

The talk will discuss our recent advances in overcoming the long-standing technical barriers for label-free molecular imaging using intrinsic MR signals. This ultrafast MRSI technology, resulting from many years of research efforts, is based on a new approach to spatiospectral imaging, which includes rapid data acquisition, sparse sampling of (k, t)-space, constrained image reconstruction, and learning-based spectral quantification using spectral basis from quantum simulation. This technology has demonstrated an unprecedented combination of resolution, speed and SNR for MRSI. In this talk, I will discuss this new ultrafast MRSI technology and show some exciting experimental results we have obtained.

### Biography

Zhi-Pei Liang received his Ph.D. degree in Biomedical Engineering from Case Western Reserve University in 1989. He subsequently joined the University of Illinois at Urbana-Champaign (UIUC) first as a postdoctoral fellow (working with the late Nobel Laureate Paul Lauterbur) and then as a faculty member in the Department of Electrical and Computer Engineering. Dr. Liang is currently the Franklin W. Woeltge Professor of Electrical and Computer Engineering; he also co-chairs the Integrative Imaging Theme in the Beckman Institute for Advanced Science and Technology. Dr. Liang's research is in the general area of magnetic resonance imaging and spectroscopy, ranging from spin physics, signal processing, and machine learning, to biomedical applications. Research from his group has received a number of recognitions, including the Sylvia Sorkin Greenfield Award (Medical Physics, 1990), Whitaker Biomedical Engineering Research Award (1991), NSF CAREER Award (1995), Henry Magnuski Scholar Award (UIUC, 1999), University Scholar Award (UIUC, 2001), Isidor I. Rabi Award (International Society of Magnetic Resonance in Medicine, 2009), IEEE-EMBC Best Paper Awards (2010, 2011), IEEE-ISBI Best Paper Award (2010, 2015), Otto Schmitt Award (International Federation for Medical and Biological Engineering, 2012), and Technical Achievement Award (IEEE Engineering in Medicine and Biology Society, 2014). Dr. Liang is a Fellow of the IEEE, the International Society for Magnetic Resonance in Medicine, and the American Institute for Medical and Biological Engineering. He was elected to the International Academy of Medical and Biological Engineering in 2012. Dr. Liang served as President of the IEEE Engineering in Medicine and Biology Society from 2011-2012 and received its Distinguished Service Award in 2015.

## Ick Chan Kwon, Ph.D.

### Nanotheragnosis as a New Paradigm of Personalized Medicine

Wednesday, July 12, 2017, 09:40-10:30, Cho Room

**Abstract**

Companion Diagnosis, based on pharmacogenomics, has been recognized as one of most important key representatives of personalized medicine. However, Companion Diagnosis does not provide any clues in developing new ways of therapeutics but it only provides a best choice of drugs based on given genetic information. Therefore, to step further for the future advancement of personalized medicine, we need to introduce a concept of therapeutics in Companion Diagnosis. Here, we introduce Theragnosis as a new paradigm of personalized medicine, which includes both a real-time visualization of disease phenotypes and a novel adaptive design of therapeutics all together at the same time.

Approaches in combining these two important functionalities all together in a polymer nanoparticle are proposed in this presentation. Self-assembled and auto-quenched fluorescent nanoparticular probes have been designed to visualize target molecules, such as proteases and protein kinases. These nanoparticles can also serve as useful therapeutic tools with using novel drug delivery technologies. Moreover, it might be possible to evaluated therapeutic efficacies in real-time manner when therapeutic design shares principles of diagnostic imaging. Examples of theragnostic design of 'dose-amplification' will be introduced in this presentation.

**Biography**

Ick Chan Kwon is a Tenured Principal Research Scientist and Director-General of Biomedical Research Institute in Korea Institute of Science and Technology (KIST). He is also a Professor of KU-KIST Graduate School in Korea University. He received his B.S. and M.S. degrees in Textile Engineering at Seoul National University in 1982 and 1984, respectively. He received his Ph. D. in Pharmaceutics and Pharmaceutical Chemistry from University of Utah in 1993. After a post-doctoral training at Center for Controlled Chemical Delivery in University of Utah, he joined KIST in 1994. He served as a vice president (2005-2008) and president (2008-2010) of the Korean Society of Molecular Imaging and currently serves as an Editor for Asia of the Journal of Controlled Release (Elsevier). He is a fellow of The Korean Academy of Science & Technology and a member of The National Academy of Engineering of Korea. His main research interest is development of smart nano-probes for theragnosis and molecular imaging with polymeric nanoparticles. He received Samsung Polymer Science Award from The Polymer Society of Korea (2013) and Academy Award from The Korean Academy of Science and Technology (2014). He recently awarded Order of Science and Technology Merit (Ungbi Medal) from the Republic of Korea (2016). He has published over 360 peer-reviewed articles (total citation 16,400, h-index 73 by Web of Science) and delivered 70 invited lectures at International Conferences.

## Hanjoong Jo, Ph.D.

### Flow Sensitive Genes in Endothelial Inflammation and Atherosclerosis

Wednesday, July 12, 2017, 09:40-10:30, Park Room

**Abstract**

Atherosclerosis is the major underlying cause of myocardial infarction and stroke and preferentially occurs in arterial regions exposed to disturbed flow (*d-flow*) by mechanisms involving broad changes in gene expression.

We have shown that *D-flow* rapidly induces atherosclerosis *in vivo* using a mouse partial carotid ligation model. In addition, we developed a novel intimal RNA/DNA preparation method using this animal model and identified numerous mechanosensitive endothelial genes and epigenetic DNA methylome that change in response to d-flow. We showed that flow robustly regulate expression of microRNAs, including miR-712/205 family and miR-663, and their roles in endothelial inflammation and atherosclerosis. Our results showed that targeting mechanosensitive "athero-miRs" with anti-miR-based approaches might provide a new treatment paradigm in atherosclerosis. We also showed recently that these anti-miRs could be delivered to inflamed endothelium in vivo by using the VCAM1-targeting nanoparticle to treat atherosclerosis in mouse. These flow-sensitive novel anti-atherogenic therapeutics and their targeted delivery using nanoparticles are exciting future directions in prevention and treatment of atherosclerotic diseases.

## Biography

Dr. Hanjoong Jo is John and Jan Portman Professor and Associate Chair for Emory BME in the Coulter Department of Biomedical Engineering (BME) at Georgia Tech and Emory University, and Professor of Medicine at Emory University. Dr. Jo received BS at Korea University and PhD at Pennsylvania State University. Following postdoctoral training in Jay McDonald Lab at Washington University in St. Louis and University of Alabama at Birmingham, he became Assistant Professor in Pathology and Biomedical Engineering. Dr. Jo joined the BME Department at Georgia Tech and Emory University in 2000. He directs the Cardiovascular Mechanobiology and Nanomedicine lab. His lab studies how blood flow regulates genes in endothelial cells, and how they induce or prevent atherosclerosis and aortic valve disease. To this end, his lab uses OMICs approaches to discover novel flow-sensitive coding and non-coding genes, develops novel therapeutics by targeting the flow-sensitive genes, and develops novel nanodelivery methods for targeted therapies to treat the cardiovascular disease. He has published more than 165 peer-reviewed papers and two books as editor. He is an elected fellow of American Institute of Medical and Biological Engineering, Biomedical Engineering Society, American Heart Association and American Physiological Society. He served as associate editors and editorial board members of several journals including Scientific Reports, Atherosclerosis Thrombosis Vascular Biology, Am J Physiology and Cardiovascular Engineering and Technology. He also has been serving as reviewers and chairs of study sections of the NIH, NSF, Veterans Administration and Am Heart Association. He served as the Chair of several international conferences including the Annual BME Society Meeting in 2012 and 11th International Symposium in Biomechanics and CVD. He is also the founding President of Korean-American BME Society and Chairs of US-Korea Annual BMES Workshops since 2013 as well as the Program Co-Chair of 2016 US-Korea Conference. He has been a Distinguished Visiting Professor at Ewha Womans University and Chonbuk National University.

## Chang-Jin Kim, Ph.D.

**EWOD Digital Microfluidics and Its Biomedical Applications Including the Synthesis of PET Radiotracers**

Wednesday, July 12, 2017, 09:40-10:30, Min Room

## Abstract

The reconfigurable microfluidics mechanism of electrowetting-on-dielectric (EWOD) has led to various optical and biological applications. In a typical EWOD device, including commercial ones, aqueous droplets in oil are manipulated by electric signals. If operational in air environment as well (i.e., no oil surrounding the droplets), EWOD would open the door for many additional applications. One example is MALDI-MS, where the aqueous liquid needs to be evaporated prior to sample analysis – this is not possible if in oil. We have demonstrated an integrated EWOD-MALDI-MS chip designed for parallel processing of multiple sample droplets without oil. Leveraging on this success, our team between engineering and medicine at UCLA has been working to synthesize PET tracers on an EWOD digital microfluidic platform. All the key steps have been demonstrated on a single EWOD chip to synthesize a variety of $^{18}$F-labeled tracers in the nanomole quantities necessary for PET imaging. The obtained fluorination efficiencies (90-95%) and synthesis times (30-60 min) were comparable to conventional approaches, and overall yields were sufficient for eventual clinical use. Additional techniques, including dose scale-up and product purification, have been developed on chip to move towards the ultimate goal of producing tracers

for clinical imaging. The resulting integrated system, being commercialized by Sofie Biosciences, is expected to dramatically reduce radiation shielding and the associated cost, empowering final users to produce radiotracers of their choice locally and eventually making PET imaging as readily available as CT and MRI.

## Biography
Professor CJ Kim received his B.S. from Seoul National University, M.S. from Iowa State University, and Ph.D. from the University of California at Berkeley, all in mechanical engineering, and joined the faculty at UCLA in 1993. Directing the Micro and Nano Manufacturing Laboratory, his research is in MEMS and Nanotechnology, including design and fabrication of micro/nano structures, actuators and systems, with a focus on the use of surface tension. The recipient of the Research Excellence Award (Iowa State Univ.), TRW Outstanding Young Teacher Award (UCLA), NSF CAREER Award, ALA Achievement Award, Samueli Outstanding Teacher Award (UCLA), and Ho-Am Prize in Engineering, Prof. Kim has served on numerous professional and governmental committees and panels in MEMS and nanotechnology, including General Chair of the 2014 IEEE International Conference on MEMS. An ASME Fellow, he is currently serving as Senior Editor of the IEEE Journal of MEMS; on the Editorial Advisory Board for IEEJ Transactions on Electrical and Electronic Engineering; and on the International Steering Committee of IEEE MEMS. He has also been active in the commercial sector as a scientific advisor, consultant, and founder of start-up companies.

## Kyongtae Ty Bae, Ph.D., M.D., M.B.A.

**The Only Constant is Change: A Professional Journey and Personal Perspective from an Engineer, Radiologist, Administrator and Entrepreneur**

Wednesday, July 12, 2017, 10:50-12:20, Opening and Plenary, Roentgen Hall

## Abstract
We all have finite years in our professional career life—however long that may be—and a desire to accomplish as much as we can during that period. As our initial career choice changes and advances, we need to adopt and adapt to these changes and advances as efficiently and effectively as possible to best fulfill our evolving career goals. There are a number of approaches and choices to be made in designing a career and practicing a profession. I, as an engineer, radiologist, administrator, and entrepreneur, would like to share my personal professional journey and perspective by highlighting some of my work in imaging science and radiology along with a brief history of the evolving changes and opportunities in radiology and related healthcare.

## Biography
Kyongtae Ty Bae, PhD, MD, MBA, is Associate Dean Clinical Imaging Research, former Chairman and Professor of the Department of Radiology at the University of Pittsburgh, the largest academic radiology department in USA. He is also a Professor of Bioengineering and the Director of the Imaging Biomarker Lab in the Department of Radiology. He graduated from Seoul National University with a BS in Chemical Engineering. He received a MS in Chemical Engineering from the University of Iowa, MS and PhD in Bioengineering from the University of Pennsylvania, and a MD from the University of Chicago. Dr. Bae did his Radiology residency and fellowship training at the Mallinckrodt Institute of Radiology, Washington University in St Louis and rose through the academic ranks before moving to University of Pittsburgh. Recently, he graduated from the Executive MBA Program at Wharton School of Business at the University of Pennsylvania.

In addition to clinical radiology practice, Dr. Bae has research interests in applying quantitative and physiologic imaging and computer applications in diagnostic imaging including contrast medium pharmacokinetics, functional and physiologic CT and MRI imaging, and computer-aided diagnosis to advance clinical translational and imaging biomarker research in a wide range of diseases. Dr. Bae's Imaging Biomarker Lab specializes in developing and analyzing morphological and functional imaging biomarkers from CT, clinical and high-field MR images.

Dr. Bae has published over 560 papers, proceedings, and abstracts including over 225 peer reviewed journal publications (H-index 60). He is responsible for securing over $22 million in NIH and DOD grants to pursue research over the past 17 years. He has also supervised clinical and research training of numerous students,

residents, postdoctoral fellows and visiting scholars during his academic career. At the national level of radiology organizations, Dr. Bae served as Chair of the Academic Radiology Research Council and Chair of the Radiological Society of North America Research Grant Review Study Sections.

Dr. Bae holds eleven patents and founded companies in the field of medical device and informatics. Seven of his patents were licensed for commercial implementations.

## Mark Prausnitz, Ph.D.

**Vaccination using Microneedle Patches: Design, Development and Clinical Translation**

Wednesday, July 12, 2017, 13:20-14:10, Cho Room

## Abstract

While vaccines have dramatically reduced morbidity and mortality due to infectious diseases, there remain significant opportunities to improve vaccine immunogenicity and delivery. To address this need, we have developed microneedle patches, each containing an array of micron-sized needles on an adhesive backing, to be used for vaccine delivery to the skin. Our studies show that skin vaccination using microneedle patches is significantly more immunogenic than conventional intramuscular injection, as measured by improved humoral and cellular immune responses, protection against disease, longevity of immune responses, breadth of immunity and other measures. Microneedle patches can also improve vaccine delivery because they are easily and painlessly applied by pressing against the skin and, when using water-soluble microneedles, do not leave behind sharps waste. The patches are single-dose, do not require reconstitution, are easy to administer, have reduced size to simplify storage, transportation and waste disposal, and often have increased thermostability. Our studies have emphasized influenza vaccination, including many small-animal studies that have enabled a Phase 1 clinical trial currently under way. Additional studies have examined inactivated polio, measles and rubella vaccines in monkeys and a number of other vaccines in small animals. Translation of this technology into commercial development is occurring at a number of companies, including one that was founded by our team at Georgia Tech.

## Biography

Mark Prausnitz is Regents' Professor and J. Erskine Love Professor of Chemical and Biomolecular Engineering at the Georgia Institute of Technology. He earned a BS degree from Stanford University and a PhD degree from MIT, both in chemical engineering. Dr. Prausnitz and his colleagues carry out research on biophysical methods of drug delivery, which employ microneedles, ultrasound, lasers and other physical means to control the transport of drugs and vaccines into and within the body.

A major area of focus involves the use of microneedle patches to apply vaccines to the skin in a painless, minimally invasive manner. In collaboration with Emory University, CDC and other organizations, Dr. Prausnitz' s group is advancing microneedles from device design and fabrication through pharmaceutical formulation and pre-clinical animal studies and into studies in human subjects. The Prausnitz group has also developed hollow microneedles for targeted drug delivery in the eye in collaboration with Emory University. Other projects including the use of laser-activated nanoparticles to facilitate intracellular delivery of molecules, design of ionic liquids as pharmaceuticals and adaptation of microneedle technology to extract fluid from the skin for diagnostic and monitoring purposes.

In addition to research activities, Dr. Prausnitz teaches an introductory course on engineering calculations, as well as two advanced courses on pharmaceuticals. He also serves the broader scientific and business communities as a frequent consultant, advisory board member and expert witness, and has co-founded four start-up companies.

**Bin He**

Inverse Imaging: What, How, and the Impact to Health

Wednesday, July 12, 2017, 13:20-14:10, Roentgen Hall – Plenary Talk

Wednesday, July 12, 2017, 10:50-12:20, Roentgen Hall – Award Presentation

## 2017 IEEE BIOMEDICAL ENGINEERING AWARD

*Sponsored by the IEEE Circuits and Systems Society and*
*IEEE Engineering in Medicine and Biology Society*

The IEEE Biomedical Award is presented to an individual or a team with outstanding contributions to the field of biomedical engineering. The 2017 IEEE Biomedical Engineering Award will be presented to Prof. Bin He at the EMBC17 for his contributions to neuroengineering and neuroimaging.

### Abstract
Biomedical imaging plays a significant role in health management, providing the ability to noninvasively assess the structure and function of biological systems. Many imaging methods essentially solve an inverse problem in which physical properties within the body are estimated from limited measurements acquired from outside the body or on the body surface. In this presentation, we will focus on an array of inverse problems used to reconstruct distributions of electrical sources and electrical properties from noninvasive measurements. Excitable cells generate electrical activity as part of their fundamental function within the body, most notably in the brain and the heart. Electrical properties reflect the characteristics of biological tissues, which connect bioelectrical activities with noninvasive measurements, determine the passive response of tissue to externally applied fields, and also contain information about tissue pathology. We will discuss how dynamic electrical activity over the three-dimensional volume can be estimated by solving linear or nonlinear inverse problems from noninvasive electrical or magnetic measurements. Such electrical source imaging techniques provide important physiological and pathophysiological information in humans, including mapping brain cognition, mental disorders, epileptic networks, and cardiac arrhythmic activity. We will also discuss how tissue electrical properties can be imaged using electromagnetic, acoustic, and magnetic resonance based measurements. Such electrical property imaging provides important information for early cancer detection and diagnosis, as well as for monitoring tissue responses to external interventions.

### Biography
Bin He is Director of the Institute for Engineering in Medicine, Distinguished McKnight University Professor of Biomedical Engineering, and Medtronic-Bakken Endowed Chair for Engineering in Medicine at the University of Minnesota, Minneapolis. Dr. He has made significant contributions to biomedical inverse imaging, including electrophysiological source imaging and tissue electrical property imaging, as well as to brain-computer interface technology. His pioneering work has transformed electroencephalography into an important dynamic, three-dimensional neuroimaging modality for noninvasive brain research and management of brain disorders. He has changed the understanding of what noninvasive brain-computer interfaces can do. Dr. He has received a number of recognitions, including the IEEE Technical Field Award in Biomedical Engineering, the Academic Career Achievement Award from the IEEE Engineering in Medicine and Biology Society, and the Established Investigator Award from the American Heart Association. He was President of the IEEE Engineering in Medicine and Biology Society, and is the Editor-in-Chief of IEEE Transactions on Biomedical Engineering and a Member of the NIH BRAIN Multi-Council Working Group. Dr. He is a Fellow of the IEEE and the American Institute for Medical and Biological Engineering. He was elected to the International Academy of Medical and Biological Engineering in 2012 and is currently Chair-Elect of the Academy.

## Vasilis Ntziachristos, Ph.D.

**A New Look into Tissue with Multispectral Optoacoustic Tomography: Progress and Entrepreneurship**

Thursday, July 13, 2017, 09:40-10:30, Roentgen Hall

### Abstract

Optical imaging is unequivocally the most versatile and widely used visualization modality in the life sciences. Yet it has been significantly limited by photon scattering, which complicates imaging beyond a few hundred microns. For the past few years, there has been an emergence of powerful new optical and optoacoustic imaging methods that can offer high resolution imaging beyond the penetration limits of microscopic methods. The talk discusses progress in multi-spectral opto-acoustic tomography (MSOT) that brings unprecedented optical imaging performance in visualizing anatomical, physiological and molecular imaging biomarkers. Some of the attractive features of the method is the ability to offer 10-100 microns resolution through several millimeters to centimeters of tissue and real-time imaging. We demonstrate implementations in the time and frequency domain, showcase how it is possible to accurately solve fluence and spectral coloring issues for yielding quantitative measurements of tissue oxygenation and hypoxia and demonstrate applications in resolving inflammation, metabolism, and angiogenesis in label free mode. In parallel, we summarize progress with clinical systems that offer to change readings of disease *in-vivo* and discuss complementarity with ultrasound imaging, fluorescence imaging and other modalities. Finally, the talk offers insights into new miniaturized detection methods based on ultrasound detection using optical fibers, which could be used for minimally invasive applications.

### Biography

Vasilis Ntziachristos Ph.D. is a Professor of Medicine and Electrical Engineering, the Director of the Chair for Biological Imaging (CBI) and of the Munich School of Bioengineering (MSB) at the Technical University of Munich and the director of the Institute for Biological and Medical Imaging (IBMI) at the Helmholtz Zentrum Munchen. He has received the Diploma in Electrical Engineering and Computer Science from the Aristotle University of Thessaloniki, Greece, M.Sc and Ph.D. degrees in Bioengineering from the University of Pennsylvania in Philadelphia PA and has served as faculty at Harvard University and the Director of the Laboratory for Bio-optics and Molecular imaging at the Massachusetts General Hospital. He has received his masters and doctorate degrees from the Bioengineering Department of the University of Pennsylvania and the Diploma on Electrical Engineering from the. Professor Ntziachristos regularly serves as chair in international meetings and councils and in the editorial boards of several scientific journals and has received numerous awards and distinctions, including the Gold Medal from the Society for Molecular Imaging (2015), the Gottfried Leibnitz prize (2013), the Erwin Schrödinger Award (2012) and was named one of the world's top innovators by the Massachusetts Institute of Technology (MIT) Technology Review in 2004.

## Michael Unser, Ph.D.

**Computational Bioimaging: How to Further Reduce Exposure and/or Increase Image Quality**

Thursday, July 13, 2017, 09:40-10:30, Park Room

### Abstract

We start our account of inverse problems in imaging with a brief review of first-generation reconstruction algorithms, which are linear and typically non-iterative (e.g., back projection). We then highlight the emergence

of the concept of sparsity, which opened the door to the resolution of more difficult image reconstruction problems, including compressed sensing. In particular, we demonstrate the global optimality of splines for solving problems with total-variation (TV) regularization constraints. Next, we introduce an alternative statistical formulation where signals are modeled as sparse stochastic processes. This allows us to establish a formal equivalence between non-Gaussian MAP estimation and sparsity-promoting techniques that are based on the minimization of a non-quadratic cost functional. We also show how to compute the solution efficiently via an alternating sequence of linear steps and pointwise nonlinearities (ADMM algorithm). This concludes our discussion of the second-generation methods that constitute the state-of-the-art in a variety of modalities.

In the final part of the presentation, we shall argue that learning techniques will play a central role in the future development of the field with the emergence of third-generation methods. A natural solution for improving image quality is to retain the linear part of the ADMM algorithm while optimizing its non-linear step (proximal operator) to minimize the reconstruction error. Another more extreme scenario is to replace the iterative part of the reconstruction by a deep convolutional network. The various approaches will be illustrated with the reconstruction of images in a variety of modalities including MRI, X-ray and cryo-electron tomography, and deconvolution microscopy.

## Biography
Michael Unser is professor and director of EPFL's Biomedical Imaging Group, Lausanne, Switzerland. His primary area of investigation is biomedical image processing. He is internationally recognized for his research contributions to sampling theory, wavelets, the use of splines for image processing, stochastic processes, and computational bio imaging. He has published over 250 journal papers on those topics. He is the author with P. Tafti of the book "An introduction to sparse stochastic processes", Cambridge University Press 2014.

From 1985 to 1997, he was with the Biomedical Engineering and Instrumentation Program, National Institutes of Health, Bethesda USA, conducting research on bio imaging.

Dr. Unser has held the position of associate Editor-in-Chief (2003-2005) for the IEEE Transactions on Medical Imaging. He is currently member of the editorial boards of SIAM J. Imaging Sciences, IEEE J. Selected Topics in Signal Processing, and Foundations and Trends in Signal Processing. He co-organized the first IEEE International Symposium on Biomedical Imaging (ISBI'2002) and was the founding chair of the technical committee of the IEEE-SP Society on Bio Imaging and Signal Processing (BISP).

Prof. Unser is a fellow of the IEEE (1999), a EURASIP fellow (2009), and a member of the Swiss Academy of Engineering Sciences. He is the recipient of several international prizes including three IEEE-SPS Best Paper Awards and two Technical Achievement Awards from the IEEE (2008 SPS and EMBS 2010).
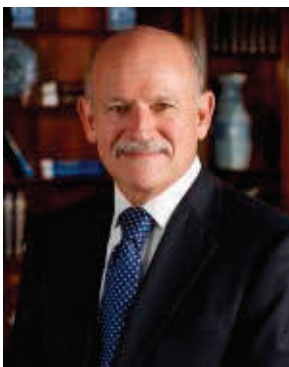


## Steven B. Heymsfield, M.D.

New Technologies: Role in Diagnosing and Managing Obesity

Thursday, July 13, 2017, 13:20-14:10, Roentgen Hall

## Abstract
Overweight and obesity rates continue to increase at a global level and some international agencies now consider the presence of severe obesity a diagnosable chronic disease. Screening populations for excess adiposity typically involves use of body weight and height indices such as body mass index. Identified individuals are now treated using a series of measures including lifestyle management advancing to pharmacotherapy and bariatric surgery. All of these areas are benefitting from the introduction of new digital technologies including advanced screening methods for quantifying adiposity, approaches for estimating energy and food intake along with physical activity levels, and telecommunication lifestyle programs for managing body weight. While many of these approaches are now part of the accepted evaluation and weight control management paradigm, others are still being critically evaluated for their practical and cost-effective application. This is an area of intense technology development and one that has important gaps that need to be filled. The presentation will cover these rapidly advancing areas of biomedical engineering.

**Biography**
Steven B. Heymsfield, M.D. is Professor and Director of the Body Composition-Metabolism Laboratory at the Pennington Biomedical Research Center of the Louisiana State University System in Baton Rouge. Dr. Heymsfield stepped down as Executive Director of Pennington Biomedical in 2013 to assume his current position.

Dr. Heymsfield received a degree in medicine from Mount Sinai School of Medicine, and he completed his internship, residency, and fellowship in pharmacology at Emory University. He then joined the Emory University School of Medicine faculty, holding positions there including Associate Professor of Medicine and Assistant Director of the NIH-funded Clinical Research Unit. Expanding on his interests in obesity and metabolism, Dr. Heymsfield next moved to Columbia University, College of Physicians and Surgeons and there he held positions as Professor of Medicine and Deputy Director, New York Obesity Research Center at St. Luke's-Roosevelt Hospital. He and his Columbia colleagues conducted wide ranging clinical studies on obesity with a focus on energy metabolism, body composition, and pharmacologic weight control management. Prior to his Pennington Biomedical position, Dr. Heymsfield was the Global Director of Scientific Affairs for the obesity group at Merck & Co.

Dr. Heymsfield has published more than 600 peer-reviewed papers covering topics such as obesity, malnutrition, cachexia, body composition, and caloric expenditure. His contributions to the study of human nutrition led to the TOPS Award from The Obesity Society, the Rhoads Award from the American Society of Parenteral and Enteral Nutrition (ASPEN), the **Robert H. Herman Memorial Award, American Society of Nutrition** (ASN), the George Bray Founders Award from The Obesity Society, and he was honored for his role in the FDA ban on ephedra, receiving the 2004 NYC Mayor's Award for Science and Technology. Dr. Heymsfield was elected Fellow of The Obesity Society in 2014, and he is an honorary member of the American Dietetic and Chilean Clinical Nutrition Associations. Dr. Heymsfield is past-president of ASPEN and ASN and he is vice-president of The Obesity Society.



## Bruce Wheeler, Ph.D.

**Brain on a Chip: From Patterns to Circuits that Transfer Information**

Thursday, July 13, 2017, 13:20-14:10, Cho Room

**Abstract**
Building a Brain on a Chip, while certainly a wild idea, is closer to reality than is reasonable to expect, thanks to applications of both engineering and applied biology. Applications of traditional engineering technologies – signal processing, electronics, microlithography, materials science – make possible the controlled growth, recording, and stimulation of nerve cells, making addressable the goal of engineering working biological models of circuits within the brain that have importance for both fundamental and disease understanding.

This presentation begins with an overview of the effort, including developments in electrode array technology, lithographic and microtunnel techniques that can control the patterns of growth of neurons in culture, and the creation of microcircuits of discrete brain structures. These techniques are beginning to make possible neural circuits about which we can ask the natural question: "What information are they processing?"

Included are recent results from investigations in which microdissected regions of the brain are separately cultured so as to partially reconstruct a major brain circuit in the hippocampus, which is involved in learning and memory. Interestingly, biomarkers indicate that the identities of the different brain regions are preserved after culture and that at least some of their computational properties appear consistent with those inferred from in vivo animal recordings.

**Biography**
Bruce Wheeler was President of the IEEE Engineering in Medicine and Biology Society, the world's largest biomedical engineering society. He was the Editor in Chief of the IEEE Transactions on Biomedical Engineering, the largest and most cited general biomedical engineering journal.

Dr. Wheeler is now an Adjunct Professor in the Bioengineering at the University of California San Diego. He is Emeritus Professor at both the University of Florida, where he was the Acting Chair of the Biomedical Engineering Department, and of the University of Illinois, where he was the Founding Head of the Bioengineering Department, Professor and Associate Head of Electrical and Computer Engineering, and Chair of the Neuroscience Faculty. He received a double B.S. degree from MIT in History and Science and the M.S. and Ph.D. in Electrical Engineering from Cornell University. He has taught high school in Niskayuna, New York and elementary school in Blacksburg Virginia.

He is a Fellow of the AAAS, IEEE, BMES, AIMBE, and IAMBE.

Prof. Wheeler's research interests lie in the application of electrical engineering methodologies, signal processing and microfabrication, to the study of the nervous system, including the microlithographic control of the patterns of growth of neurons in vitro to permit stimulation and recording with microelectrode arrays. Hopefully this work will lead to better understanding of the behavior of small populations of neurons and lead to better insights into the functioning of the brain. He also has been involved in algorithm development for directional hearing aids.

Dr. Wheeler has a long time interest in education. At Illinois he was Associate Head for Undergraduate Affairs and responsible for the advising of 1600 students. He is likely the only person to create two undergraduate bioengineering degree programs (Illinois and Florida). His current position is in support of a new undergraduate program in Systems Bioengineering, which he and UCSD hope will help shape the future of biomedical engineering education.

### Damijan Miklavčič, Ph.D.

### Electroporation for Improving the Quality of Life

Thursday, July 13, 2017, 13:20-14:10, Park Room

Abstract

When a cell is exposed to an electric field of sufficient amplitude its membrane becomes permeable for molecules that otherwise are deprived of transmembrane transport mechanisms. Some chemotherapeutic drugs which have intracellular target but lack efficient transport across the membrane (e.g. bleomycin, cisplatin) can greatly benefit from membrane permeabilization (electroporation). Bleomycin cytotoxicity has been demonstrated to be increased 1.000-10.000 times, whereas for cisplatin this potentiation in vitro was 10-100 times. This potentiation of drug cytotoxicity was effectively translated from in vitro to in vivo preclinical trials and finally introduced into clinical practice as electrochemotherapy. The metastases of different origin have responded locally to electrochemotherapy with overall complete response rate of 59.4% and objective response rate of 84.1%. Since 2006, electrochemotherapy has been introduced into more than 150 clinical centers around Europe and is paving its way into standard clinical use. The procedure is efficient, safe, well tolerated by patients and can be performed on an outpatient basis.

As electroporation of membranes of cells in tissue depends predominantly on local electric field, it is possible to treat with electrochemotherapy also internal tumors. Local electric field can be established by inserting electrodes into the tissue. The "shaping" of the field by using multiple electrodes in combination with treatment planning procedures and image-guided insertion of electrodes allows treating of solid tumors irrespective of their location. Recent clinical trials in treating colorectal liver metastasis, metastasis in bone, and soft tissue sarcoma by means of needle electrodes proved feasibility of electrochemotherapy for deep-seated tumors making this new treatment modality a promising new tool in armamentarium of oncologists.

In a similar fashion, electroporation can be used to introduce large molecules like pDNA both in vitro as well as in vivo, which is used for gene therapy and DNA vaccination. Electroporation of cells can however also lead to cell death, which has been recognized as non-thermal ablation method of soft tissue and has already be demonstrated for its use in clinical setting for tumor ablation and myocardial ablation in animal model.

## Biography

Damijan Miklavčič received a Ph.D. in Electrical Engineering from the University of Ljubljana in 1993. He is Full Professor and Head of the Laboratory of Biocybernetics at the Faculty of Electrical Engineering, University of Ljubljana, where he previously served also as vice-dean for research and Chair of the Department of Biomedical Engineering.

Throughout his academic career, he has been active in rehabilitation engineering, experimental oncology, and cell biology. In the last two decades, he specifically focused on electroporation-based gene transfer and drug delivery coupled with theoretical modeling of biophysical and biological processes, as well as development of hardware allowing for efficient electroporation both in vitro and in vivo. His current interests lie in further advancing electrochemotherapy as local treatment of internal malignant tumors, transferring the knowledge on tissue electroporation to other fields like food science, and development of innovative environmentally friendly applications of electroporation.

Damijan Miklavčič has lead a number of national and international research projects including a global network funded by COST (www.electroporation.net), and organized various international scientific meetings with one of most recent being the 1st World Congress on Electroporation. He has served as editor and guest editor in various scientific journals, and collaborated with more than 60 SCI journals as reviewer.

### Thomas Penzel, Ph.D.

**Signal Recording and Non-Linear Processing in Sleep Research**

Thursday, July 13, 2017, 13:20-14:10, Min Room

## Abstract

Sleep disorders are found to be more prevalent than previously realized. This may be a consequence of a modern society, which optimizes work and social activities up to the edge.

In order to investigate normal and disturbed sleep, we record biosignals both in the sleep laboratory and at home. Signals may be recorded directly, such as EEG, EOG, and EMG from the head of the sleeping person, or indirectly, such as ECG, heart rate, respiration, pulse wave. Signals may be recorded with little contact or no contact systems such as actigraphy, body movement, bed sensors or bedside radiofrequency sensors. Some signals are new in sleep research and require new technology and analysis concepts.

Always biosignals were recorded with an appropriate time and amplitude resolution, and then we derive physiological functions. We can identify wakefulness and sleep, we can derive details about sleep, such as light sleep, deep sleep, and REM sleep, arousals and sleep fragmentation. Not only classical methods in the time and frequency domain are used, but also more recent methods using statistical approaches are applied.

This allows recognizing normal and restorative sleep and identifying sleep disorders as well. Some sleep disorders imply cardiovascular consequences and require treatment. Sleep disordered breathing is the disorder with most cardiovascular consequences. Many diagnostic tools focus on this group of disorders [1]. Diagnostic methods and perspectives are presented in this communication.

[1] IEEE Engineering in Biology and Medicine Society: "The Science of Sleep". Pulse Magazine. Sept. / Oct. issue 2014.

## Biography

Dr. Thomas Penzel graduated from physics (1986), human biology (1991), and physiology (1995) at the University Marburg, Germany. In 1997, he received a certificate for sleep medicine and for medical informatics. In 2001 became extra-ordinate Professor at the University of Marburg. At the University hospital Marburg, he started in 1982 and installed the first sleep lab in a Department for Internal Medicine in Germany. This lab initiated many

activities in the field of sleep medicine like home sleep apnea testing, deriving sleep apnea and sleep stages from ECG and heart rate, sleep center accreditation, cardio respiratory coupling analysis, sleep physician training and certification, and conferences with engineers and physicians on sleep medicine. In 2006, he moved to Berlin to join the interdisciplinary sleep medicine center at the Charité University hospital. He received the Bial award for clinical medicine in Portugal 2001, the Bill Gruen Award for Innovations in Sleep Research by the Sleep Research Society in 2008, the Somnus Award by Sleep apnea patient groups in Germany 2012, and the distinguished development award by the Chinese sleep research society in 2014. He is treasurer of the World Sleep Society (WSS), secretary of the German Sleep Society (DGSM), and board member of other societies. He authored more than 250 papers, book chapters and books. He is an editorial board member on journals in sleep research and biomedical engineering. His research focus is on new methods in sleep recording and cardiovascular consequences of sleep disorders. He is chair of the German IEEE EMB chapter and past chair of EMB TC cardiopulmonary systems.

### Chunlei Liu, Ph.D.

**MRI of Bio-Magnetism**

Thursday, July 13, 2017, 14:20-15:50, Roentgen

### Abstract

Human body can be weakly (about 0.01ppm) magnetized by the strong magnetic field inside MRI scanners. This magnetization originates from the magnetic susceptibility of biomolecules and certain trace metals; it is further influenced by the cellular architecture of tissue. Until very recently, the spatial distribution of the magnetization and the corresponding magnetic susceptibility inside our body could not be measured, as traditional magnetometers only measure the magnetic field outside the body. Recent developments in MRI have overcome this limitation and begun to allow the mapping of magnetic susceptibility in 3D space. Magnetic susceptibility mapping not only provides a means to produce high-resolution MR images, but also offers quantitative information of the molecular contents and cellular architectures of both healthy and diseased tissues. For example, it allows the quantification of tissue iron stores, calcification in tumors, myelination in white matter, aggregation of b-amyloid in Alzheimer's disease and the dynamic conversion between oxy- and deoxyhemoglobin. Magnetic susceptibility is also orientation dependent and is a tensor quantity. Quantifying magnetic susceptibility anisotropy allows the mapping of the orientations of axonal fibers, myofibers and collagens. In NMR spectroscopy, studying magnetic susceptibility anisotropy of biomolecules have greatly enhanced the ability to determine protein structures. Similarly, studying magnetic susceptibility of biological tissue will help us assess its molecular and cellular architecture on a larger scale. These techniques have now found applications in many tissues and organs including the brain, heart, liver, kidney and knee joints.

### Biography

Chunlei Liu is an Associate Professor at the University of California, Berkeley, with the Department of Electrical Engineering and Computer Sciences, and the Helen Wills Neuroscience Institute. He received a B.S. in Physics from Peking University, an M.S. in Physics from the University of North Carolina, Chapel Hill, and a Ph.D. in Electrical Engineering from Stanford University. He was previously Associate Professor of Radiology and Biomedical Engineering at Duke University. Dr. Liu's research is in the area of magnetic resonance imaging and remote cell modulation. Dr. Liu pioneered higher-order tensor diffusion MRI that utilizes higher-order tensor statistics (variance, skewness, kurtosis etc.) to measure the diffusion processes in biological tissues. Dr. Liu is also credited for developing susceptibility tensor imaging for mapping bio-magnetism. He received NIH Pathway to Independence Award (K99) in 2006, ISMRM Young Investigator Award finalist in 2007 and RSNA Margulis Award in 2015.

## Won-Jin Moon, MD, PhD

### Clinical Application of Quantitative Susceptibility Mapping (QSM)

Thursday, July 13, 2017, 14:20-15:50, Roentgen

**Abstract**

Quantitative susceptibility mapping (QSM) is a quantification map for local susceptibility based on multi-echo 3-dimensional GRE images. QSM can be used to evaluate metals in biological tissues such as iron and calcium.

Iron load in brain is potentially associated with neurodegenerative disease. Iron is a known component of Aβ plaques and neurofibrillary tangles, and moreover may provide an ideal environment for Aβ aggregation and neurotoxicity. Therefore, the use of QSM to measure iron levels *in vivo* may offer important information to assist our understanding of the neurodegenerative process.

QSM can be also useful to detect alterations in metal contents in various pathologic conditions including inflammation, hemorrhage, pathologic calcifications or in vivo quantification of gadolinium concentrations.

In this lecture, we discuss the current and emerging QSM applications in the diagnosis and management of various neurologic diseases.

**Biography**

Dr. Won-Jin Moon is working as a section chief of Neuroradiology at the Department of Radiology, Konkuk University Medical Center and a professor at the Department of Radiology, Konkuk University School of Medicine. She completed her radiology residency from Hanyang University Medical Center and subsequently trained in Neuroradiology at Samsung Medical Center. She had studied as a visiting scholar at the Institut für Neuroradiologie, Johann W. Goethe Universität Klinikum, Germany from 1999 to 2000 and at the Department of Radiology, Duke University Medical Center from 2009 to 2010.

Her clinical activity has focused on imaging diagnosis of neurodegenerative diseases, neurovascular diseases, neuro-oncology and demyelinating diseases.

Her research interest focuses on the application and development of advanced neuroimaging techniques for neurodegenerative diseases, including functional MR imaging (task-related and task-free), diffusion-tensor imaging, perfusion-weighted imaging (dynamic susceptibility contrast, dynamic contrast enhanced, and arterial spin labeling), susceptibility weighted imaging as well as quantitative structural imaging analysis.

## Yi Wang, Ph.D.

### Clinical Quantitative Susceptibility Mapping (QSM): Biometal MRI

Thursday, July 13, 2017, 14:20-15:50, Roentgen Hall

**Abstract**

QSM should be generated as a post processing whenever a gradient echo sequence is used in MRI. The gradient echo sequence should be included in an MRI protocol when a patient is suspected of neurodegeneration, inflammation, ischemia, hemorrhage, cancer, osteoporosis, and atherosclerosis, and whenever a contrast agent is injected.

Both phase and T2* weighted hypointensity in gradient echo MRI depend on surrounding susceptibility sources in a convoluted way, or they reflect only the "shadow" of magnetic tissue [1, 2]. Tissue susceptibility can be determined by deconvolving the MRI signal phase. The field-to-source ill-posed inverse problem can be solved using anatomic information readily available in MRI, which can guide the selection of a desired solution with zero streaking and shadow artifacts. This Bayesian approach has been developed by us to enable quantitative susceptibility mapping (QSM) [3, 4]. Current QSM technology is robust enough for routine study [5-8] of very strong isotropic magnetic susceptibility sources in tissue, which are biometals. The most abundant magnetic biometals in the body are iron, calcium, and contrast agent. We outline the following opportunities to develop these biometal QSM applications.

Iron in neurons. Iron (typically $Fe2+$) as a catalyst is required to participate in most cellular biochemistries in the body. Iron overload is invariably associated with neurodegenerative diseases, such as Parkinson's disease, causing tissue damage through pathways involving oxidative stress. The vast majority of iron is stored (~99%) as $Fe3+$ mostly in ferritin, and only a very small fraction (~1%) is labile. The tight balance between stored iron concentration and bioactive labile iron concentration in each cell, as dictated by brain homeostasis, makes QSM iron storage measurement meaningful for studying neurodegenerative and other diseases. In particular, QSM is ideal for defining the deep brain stimulation target, subthalamic nucleus [9], which has rich iron due to its active generation of neurotransmitter glutamate. QSM may be critically useful in monitoring iron chelating therapy that is been developed for treating Parkinson's disease.

Iron in hepatocytes. A major consequence for liver iron overload is fibrosis and eventual cirrhosis that inherently confound R2* and R2 measurements of liver iron. As fibrosis contributes little and linearly to magnetic susceptibility, QSM would play a critical role for accurate liver iron measurement in managing iron chelating dosage in transfusional iron overload patients.

Iron in immune cell macrophages. Iron is taken up by proinflammatory M1 macrophages as the immune system responds to pathogen invasion. In multiple sclerosis (MS) where the immune system attacks the central nerve system, M1 microglia in the MS lesion neighborhood cause chronic inflammation that can for the first time be detected on QSM as a hyperintense rim [10, 11].

Iron in red blood cells. QSM can be used to quantify deoxyheme, enabling practical mapping of cerebral metabolic rate of oxygen consumption (CMRO2). QSM provides quantitative study of hemorrhages, including microbleeds that are involved in various pathological processes without blooming artifacts.

High concentration in calcification (hydroxyapatite) makes a robust QSM of diamagnetism. QSM promises to eliminate x-ray radiation for assessing bone strength, as well as bone marrow quality.

QSM solve contrast agent quantification problems in relaxation, enabling MRI quantification in drug delivery.

Biography
Professor Yi Wang (PhD 1994, University of Wisconsin-Madison) is the Faculty Distinguished Professor of Radiology of Professor of Biomedical Engineering at Cornell University. He is a Fellow of IEEE (Institute of Electrical and Electronics Engineers), ISMRM (International Society of Magnetic Resonance in Medicine), and AIMBE (American Institute for Medical and Biological Engineering). He has been elected to the Council of Distinguished Investigators of the Academy of Radiology Research. He has served as a scientific reviewer of grant applications for many agencies, including the National Institutes of Health (NIH), European Research Council, Research Grants Council of Hong Kong, Swiss National Science Foundation, and the Welcome Trust of the United Kingdom. As a Principal Investigator, he has led many NIH projects on research and education, including researches on brain function, cancer, heart disease, multiple sclerosis, Parkinson's disease, stroke, and vascular diseases. He has published 195 peer-reviewed journal papers, authored a textbook "Principles of Magnetic Resonance Imaging" and a monograph book "Quantitative susceptibility mapping: magnetic resonance imaging of tissue magnetism", edited a book "Introductory medicine for engineers", and co-authored a book "Electro-Magnetic Tissue Properties MRI".

Professor Wang's research interest has been in developing MRI technology for clinical applications. He has developed navigator motion compensation for cardiac MRI, which has become widely adopted in scientific research and clinical practice for cardiac and other MRI. He has pioneered time resolved contrast enhanced MRA, which has become a major tool for scientific and clinical investigations of cardiovascular diseases. He has pioneered multiple station stepping table platform for large field-of-view imaging as exemplified by bolus chase acquisition; the multi-coil array for multi-station as depicted in his patent has become Siemens' flagship "Tim –

Total image matrix" product. Recently, his group has introduced the quantitative susceptibility mapping (QSM) technique that has solved for the first time the field-to-susceptibility inverse problem using the Bayesian approach. QSM has broken ground for a new field in MRI for studying tissue magnetism, including iron, calcification, myelin, and contrast agents. QSM has potential applications for a wide range of inflammatory, ischemic and neurodegenerative diseases.

## Kenji Sunagawa, MD, PhD

### Smart Closed-loop Neuromodulation Revolutionizes Cardiology in the 21st Century

Friday, July 14, 2017, 09:40-10:30, Park Room

**Abstract**
In the last few decades, tremendous progress has been made in cardiology. Although molecular biology is a major driving force of this progress, technology plays a crucial role. We witness in daily patient care that sophisticated devices such as cardiac defibrillators, pacemakers, circulatory assist devices, percutaneous coronary intervention and ablation save many lives. However there is no doubt that only a little of the potential of technology has been explored. The key element that prevents full exploration would be the lack of unification of high-tech based therapeutic systems into natural human physiology. In the human body, all cells, tissues, organs, and systems operate coherently. The presence of well-developed neuro-humoral communications among these components of the body is the essential infrastructure that makes coherent functioning possible. If we could incorporate such communication mechanisms into artificial systems, they would function as if they are an integral part of the native physiological systems. We call such well-integrated smart artificial systems *bionic systems*. Cardiology utilizing smart bionic systems is *bionic cardiology*.

The bread-and-butter technology that is common to all bionic systems is the technique to unify the artificial devices with the native systems, in particular, the human body's regulatory systems. In 1996, we developed one such system, a neurally regulated cardiac pacemaker. The success of the neurally regulated pacemaker has convinced us that the autonomic system can be effectively monitored and thereby electrically manipulated. The clinical impact of direct manipulative neuromodulation of autonomic functions in cardiovascular diseases is profound. Virtually every cardiovascular disease has a major problem in its autonomic regulation. The case of central baroreflex failure is an archetypal example. The bionic baroreflex system operates as an intelligent negative feedback regulator. We demonstrated in animals and in patients that the bionic baroreflex system restores normal baroreflex function. The bionic baroreflex system opens up an entirely new therapeutic modality for patients with baroreflex failure. In our latest investigation, we demonstrated that bionic manipulative closed-loop neuromodulation of autonomic functions is extremely powerful in the management of refractory hypertension, acute myocardial infarction and heart failure.

Bionic medicine aims at improving clinical outcomes and enhancing quality of life by restoring the lost functions of failing physiological systems or organs. The combination of latest technology, biology and quantitative systems physiology, all of which are progressing very rapidly, will inspire even more intricate disruptive innovations of bionic medicine in the 21$^{st}$ century.

**Biography**
Kenji Sunagawa, MD, PhD is the founder and Professor of the Center for Disruptive Cardiovascular Medicine (CDiC) at Kyushu University, Fukuoka, Japan. CDiC is the institution to develop future medicine via disruptive innovations to save patients with treatment refractory cardiovascular disease.

Dr. Sunagawa received his M.D. in 1974 and Ph.D. in 1986 from Kyushu University, Fukuoka, Japan. He joined the cardiovascular group at the Department of Biomedical Engineering, Johns Hopkins in 1978 and contributed to establish the concept of the pressure-volume relationship of the heart, one of the most fundamental concepts of cardiac mechanics. In 1990, he was appointed chairman of the Department of Cardiovascular Dynamics as well as

the Division of Cardiology at the National Cardiovascular Center in Osaka. In 2004, he was appointed Professor and Chief of Cardiology Division and Chairman of Cardiovascular Medicine at Kyushu University. He has been extensively applying the concept of engineering to study cardiac mechanics and cardiovascular neural regulation. Those studies have led him to develop intelligent neuromodulators (i.e., bionic systems) that are interfaced and functionally unified with the native autonomic nervous system. Since the late 90s, he developed a neurally regulated cardiac pacemaker, bionic baroreflex system and bionic cardiac neuromodulator, all of which had striking impacts on the management of refractory cardiovascular disease. Because of these contributions, he received the Paul Dudley Lectureship Award from American Heart Association in 2000 and EMBS Technical Award in 2010. He served as AdCom member and chair of Technical Committee on cardiopulmonary systems of EMBS. He hosted the EMBC2013 in Osaka as the conference chair. He was a board member of the Japanese Society for Medical and Biological Engineering and the Japanese Society of Internal Medicine. He is a Fellow of American Heart Association, American College of Cardiology and European Society of Cardiology.

Prof. Sunagawa received his M.D. in 1974 and Ph.D. in 1986 from the Kyushu University, Fukuoka, Japan. From 1978 to 1983, he was a postdoctoral fellow and then appointed the faculty at the Department of Biomedical Engineering and Division of Cardiology, Johns Hopkins Medical Institutions. From 1990 to 2004, he chaired the Department of Cardiovascular Dynamics at the National Cardiovascular Center in Osaka. Since 2004, he has been the Chief and Professor of Cardiovascular Medicine at the Kyushu University. He has extensively applied engineering concepts to study cardiovascular regulation. Those studies led him to develop bionic cardiology. Bionic systems function just like native physiological systems. Since late 90s, he developed a neurally regulated pacemaker, bionic baroreflex system and bionic neurostimulator for heart failure, all of which had striking impacts in treating refractory cardiovascular diseases. Because of this contribution, he received the Paul Dudley White Award from the American Heart Association (AHA) in 2000. He has been a fellow of AHA, American College of Cardiology and European Society of Cardiology. He is a board member of Japanese Society for Medical and Biological Engineering, a senior member of IEEE, and a member of AdCom of EMBS since 2005.

### Allison Okamura, Ph.D.

**Let's be Flexible: Soft Haptics and Soft Robotics**

Friday, July 14, 2017, 09:40-10:30, Roentgen Hall

**Abstract**
While traditional robotic manipulators are constructed from rigid links and localized joints, a new generation of robotic devices are soft, using flexible, deformable materials. In this talk, I will describe several new systems that leverage softness to achieve novel shape control, provide a compliant interface to the human body, and access hard-to-reach locations. First, soft haptic devices change their shape and mechanical properties to allow medical simulation and new paradigms for human-computer interface. They can be made wearable by people or by objects in the environment, as needed to assist human users. Second, superelastic materials and 3D-printed soft plastics enable surgical robots that can steer within the human body in order to reach targets inaccessible via the straight-line paths of traditional instruments. These surgical robots are designed on a patient- and procedure-specific basis, to minimize invasiveness and facilitate low-cost interventions in special patient populations. Third, everting pneumatic tubes are used to create robots that can grow hundreds of times in length, steer around obstacles, and squeeze through tight spaces. These plant-inspired growing robots can achieve simple remote manipulation tasks, deliver payloads such as water or sensors in search and rescue scenarios, and shape themselves into useful structures.

**Biography**
Allison M. Okamura received the BS degree from the University of California at Berkeley in 1994, and the MS and PhD degrees from Stanford University in 1996 and 2000, respectively, all in mechanical engineering. She is currently a Professor in the Mechanical Engineering department and has a courtesy appointment in the Computer Science department at Stanford University. She was previously Professor and Vice Chair of Mechanical Engineering at Johns Hopkins University. She has been an Associate Editor of the IEEE Transactions on Haptics

and Co-Chair of the IEEE Haptics Symposium. She is currently Editor-in-Chief of the IEEE International Conference on Robotics and Automation Conference Editorial Board, Deputy Editor-in-Chief of the IEEE Robotics and Automation Letters, and an Editor of the International Journal of Robotics Research. Her awards include the 2016 Duca Family University Fellow in Undergraduate Education at Stanford University, the 2009 IEEE Technical Committee on Haptics Early Career Award, the 2005 IEEE Robotics and Automation Society Early Academic Career Award, and the 2004 NSF CAREER Award. She became an IEEE Fellow in 2011. Her academic interests include haptics, teleoperation, virtual environments and simulators, medical robotics, neuromechanics and rehabilitation, prosthetics, and engineering education. She directs the Collaborative Haptics and Robotics in Medicine (CHARM) Laboratory (http://charm.stanford.edu). Outside academia, she enjoys spending time with her husband and two children, running, and playing ice hockey.

## Zang-Hee Cho, Ph.D.

### Super-Resolution Tractography with 7.0T MRI-Applications to Language and Cognition

Friday, July 14, 2017, 09:40-10:30, Cho Room

### Abstract

Increasing interest of connectomic areas of research encouraged development of high-resolution tractography among others the Super-Resolution Tractography (SRT) of In-vivo Human with UHF 7.0T MRI. SRT now boasts submillimeter resolution human brain fiber connectivity with resolution down to 200 μm allowing us to look at the fine structures of the language circuitry such as Geschwind's territory and its connections to the cognitive centers, the prefrontal cortex. This talk will discuss technical aspects of the SRT and its applications to human language and cognition.

### Biography

Dr. Zang Hee Cho graduated Seoul National University and did Ph.D. in Applied physics at Uppsala University, Sweden.

Professor Cho has been faculty of University of California, Los Angeles, Columbia University, and University of California, Irvine. Professor Cho is currently Distinguished Research Fellow at the AICT, Seoul National University.

Professor Cho in the pioneer of CT, PET, and MRI and developed world's first PET scanner in 1975 while he was at UCLA. Among many awards and honors, Professor Cho elected as a member of US National Academy of Medicine in 1977.

## Shuming Nie, Ph.D.

### Pharmaceutical Engineering: Smart Drug Delivery Systems for Targeting the Tumor Microenvironments

Friday, July 14, 2017, 13:20-14:10, Park Room

### Abstract

The design and development of sophisticated nanoparticles for the targeted delivery of therapeutic drugs to solid tumors holds great promise not only for improving treatment efficacy but also for reducing systemic toxicity.

However, the currently low delivery efficiency (about 1-5 % of the injected dose) and the limited tumor penetration of nanoparticles remain two major challenges. Here we report a class of nanoscale superstructures with unusual pH-responsive and size-switching properties for targeting the acidic tumor microenvironment as well as for improved drug tumor penetration. Specifically, the supernanostructurs are constructed by using pegylated polymethacrylate copolymers containing tertiary amine groups (sensitive to pH), and the protonation or deprotonation of these tertiary amines induces a dramatic hydrophobic-hydrophilic transition which drives rapid assembly or disassembly on the nanoscale. For drug loading, this pH-sensitive copolymer is first linked to a polyaminoamine dendrimer (4the generation, MW 14K, with 64 terminal amine groups) via a stable amide bond, which is then conjugated to a platinum prodrug molecules via a succinct anhydride linker (cleavable). Once internalized into tumor cells, the platinum prodrug is converted to the active drug cisplatin by redox chemical reductions involving ascorbic acid (vitamin C) and other reducing agents. These superstructures have a relatively large size of about 80 nm at neutral pH (blood circulation), but once deposited in the acidic tumor microenvironment (pH ~6.5-7.0), they undergo a dramatic and sharp size transition within a very narrow range of acidity (less than 0.1-0.2 pH units), and dissociate rapidly into the dendrimer building blocks (less than 10 nm in diameter). This rapid size-switching feature cannot only facilitate nanoparticle extravasation and accumulation via the enhanced permeability and retention (EPR) effect, but also allows faster nanoparticle diffusion and improved tumor penetration. Using both multicellular spheroids and poorly permeable BxPC-3 pancreatic tumor models, we have systematically studied the pharmacokinetics, organ distribution, tumor penetration, and treatment efficacy for this class of pH-sensitive nanoparticle prodrugs. We have also carried out comparative studies of pH sensitive and insensitive nanostructures with similar size, surface charge, and chemical composition. The results demonstrate demonstrate that the high pH sensitivity and particle size switching are indeed viable strategies for improving drug penetration and therapeutic efficacy. This work was supported by grants from the US National Institutes of Health (U54 CA119338, RC2 CA148265, and R01CA163256).

## Biography
Dr. Shuming Nie is the Wallace H. Coulter Distinguished Chair Professor in Biomedical Engineering at Emory University and the Georgia Institute of Technology, Director of the Emory-Georgia Tech Cancer Nanotechnology Program, and Founding Dean of the College of Engineering and Applied Sciences of Nanjing University (China). His academic research is in the areas of molecular engineering and nanotechnology, with a focus on bioconjugated nanoparticles for cancer molecular imaging, molecular profiling, and targeted therapy. His major academic achievements include the discovery of colloidal metal nanoparticles that are able to amplify the efficiencies of surface-enhanced Raman scattering (SERS) by 14-15 orders of magnitude, his pioneering work on water-soluble semiconductor quantum dots for biomedical applications, and his breakthrough work in developing multifunctional smart nanoparticles for integrated biomedical imaging and therapy, including image-guided cancer surgery. Professor Nie has published over 300 papers, patents, and book chapters, have delivered more than 500 invited lectures around the world, and have trained over 30 doctoral students and postdoctoral fellows who are now making an impact at top academic institutions and biotech companies. His scholarly work has been cited over 54,000 times with an h-index of 84 (Google Scholar). Professor Nie received his BS degree from Nankai University (Tianjin, China) in 1983, earned his MS and PhD degrees from Northwestern University (Evanston, Illinois, 1984-1990), and did postdoctoral research at the Georgia Institute of Technology and Stanford University (1990-1994).



## Yo Kobayashi, Ph.D.

**Mechanical Model of Soft Biological Tissues for Computer Aided Surgery**

Friday, July 14, 2017, 13:20-14:10, Min Room

## Abstract
Understanding the physical phenomena underlying the mechanical properties of human tissue has a great impact on bioscience and engineering. This knowledge will lead to further development of machines and systems in the health care field. For example, a mechanical model of target objects (organ, tissue, etc.) is required for mechanical design, motion planning, information processing, and control of the systems.

I would like to share some of our work in mechanical model of soft biological tissues for computer-aided surgery, medical robotics, and biomedical engineering. We found from the experiments that soft biological tissues have specific and complex properties and propose a simple model to identify the viscoelastic and nonlinear properties. My talk mainly will focus on research and development of needle insertion system and palpation system based on mechanical model of soft biological tissues.

## Biography
Yo Kobayashi is now Associate Professor, Graduate School of Engineering Science, Osaka University, Osaka, Japan.

He received the BS and MS degrees from the Graduate School of Science and Engineering, Waseda University, Tokyo, Japan, in 2004 and 2005, and the PhD degree in engineering from Waseda University in 2008. He was a Visiting Research Associate in the Graduate School of Science and Engineering, Waseda University, from 2005 to 2006. He was a recipient of a Japan Society for the Promotion of Science (JSPS) Research Fellowship for Young Scientists during 2007. During 2008, he was a Research Associate in the Institute for Biomedical Engineering, Waseda University. He has been a Research Associate during 2009 and Lecturer (junior researcher) with the Faculty of Science and Engineering since 2010, Associate Professor (Senior researcher), Faculty of Science and Engineering / Future Robotics Organization, Waseda University since 2012. He is also PRESTO (Precursory Research for Embryonic Science and Technology) Researcher, Strategic Basic Research Programs, and JST.

His current research interests include soft biological tissue modeling, computer aided surgery, medical robotics and rehabilitation robotics.

### Zuhong Lu, Ph.D.

**Challenges and Opportunities in Investigation of Human Gut Metagenomics**

Friday, July 14, 2017, 13:20-14:10, Cho Room

## Abstract
Human gut microbiota is an important factor, which can reflect or affect the state of human health. Many studies already show that the biodiversity is closely related to many chronic non-communicable diseases, such as obesity, diabetes, cancer etc. However, human gut microbiome is one of the most complicated microbial communities, which contains over 1000 known species and nine million of functional genes. It is estimated that there are still a large number of gut microbes remaining unrevealed due to the difficulty of culture, especially for those species with rare or low abundance. The properties and functions of this low abundance microbial in human guts are still a black box. The present metagenomic sequencing technologies have some limitations in detection of the microbial with the abundance less than 0.1%. The technological difficulties exist in both library fabrication and bioinformatic process.

Several efforts have been published to target the problems, including eigengenome partitioning, mini-metagenome, synthetic long-read sequencing, etc... Here we will introduce a new strategy to solve the problem. Firstly, we found the differences of the sequence similarity between the genes of different species (gene uniqueness) by analyzing the genomes of the known microbiota in the human guts. Furthermore, we divided the microbiota into more than 100 sub-mcirobiota with limited cell numbers in order to reduce the complexity. We can obtain the more readers from low abundance microbial and cluster the different short de novo assembled contigs into high quality long contigs based on gene uniqueness. It is indicated that a number of low abundance species have been detected and many novel genes have been found with this method. The method would help us to discover more unknown species and understand influences of the low abundance microbial in human guts.

## Biography
Zuhong Lu received the BS and MS degrees in electronics engineering and Ph.D. degree in bioelectronics from the Southeast University at Nanjing, China in 1982, 1984 and 1988, respectively. He currently is the Cheung Kong Professor at School of Biological Science and Medical Engineering of Southeast University, Director of State Key

Laboratory for Bioelectronics. He was previously Chair Professor of Department of Biomedical engineering College of Engineering, Peking University. He is currently Chair of the Society of Biomedical Electronics, Chinese Electronics Institute and Chair of Branch of Health Engineering, Chinese Society of Biomedical Engineering. His research field covers molecular devices, biosensors, microarray technology, microfluidics, high throughput DNA sequencing, bioinformatics, health engineering, etc. He has published more than 400 peer-reviewed papers, and obtained more than 30 national patents.

## Xiaochuan Pan, Ph.D.

**X-ray Tomographic Imaging and Applications Enabled by Advanced Algorithms**

Friday, July 14, 2017, 13:20-14:10, Roentgen Hall

## Abstract

The presentation will first highlight some of the recent advances in optimization-based algorithms for image reconstruction in tomographic imaging, especially in X-ray tomographic imaging, and will then focus on discussing the challenges in adequately applying the algorithmic advances to possibly benefiting real applications of clinical or practical significance. A series of real-data examples in X-ray tomography relevant to imaging tasks in radiation therapy will be used for illustrating how optimization-based algorithms may be exploited for enabling the development of imaging systems and workflows tailored to specific applications of practical merit in medicine and other areas. The presentation will also clarify some seemingly confusing issues concerning, e.g., compressive sensing (CS) in image reconstruction and image/signal processing. If time allows, the presentation may touch upon implications of optimization-based reconstruction for PET and MRI imaging.

## Biography

Xiaochuan Pan is a Professor in the Department of Radiology, Department of Radiation & Cellular Oncology, the Committee on Medical Physics, the Comprehensive Cancer Center, and the College at The University of Chicago. His research interest centers on physics, algorithms, and applications of tomographic imaging, and has published more than 450 papers on his research. He is the recipient of numerous awards, including IEEE NPSS Early Achievement Award, IEEE EMBS Technical Award, and Distinguished Investigator Award of ARR, and is a Fellow of AAPM, AIMBE, IAMBE, IEEE, OSA, and SPIE. Dr. Pan has served as a chair and/or a reviewer of study sections/review panels for funding agencies, including NIH, NSF, DOE, AIBS, NSERC, ASF, NSFC, FNRA, SRNSF, IMSTS, and RGCHK, as a board member and associate editor for journals in the field such as *IEEE Trans. Med. Imaging*, *IEEE Trans. Biomed Eng.*, *IEEE J. Transl. Eng. Health and Med.*, *Phys. Biol. Med.*, *Med. Phys.*, and *J. Med. Imaging*, as a chair/member of technical committees of professional organizations such as IEEE, RSNA, and AAPM, and as a general chair, chair/member of programs, themes, and technical/scientific committees for conferences such as IEEE EMBC, IEEE MIC, RSNA, AAPM, and MICCIA.

## Yong Jin Lee, Ph.D.

**Wearables and Nearables for Health**

Saturday, July 15, 2017, 09:40-10:30, Roentgen Hall

### Abstract

During the past decade, we have seen the smartphone become mankind's primary connected device. It has become the one device that we always carry with us, being the device we rely on most for our computing and communication needs. We have seen it absorb entire categories of personal devices – portable music player, point-and-shoot camera, portable alarm clock, GPS navigator, portable DVD player, to name a few.

Relatively recently, however, we are starting to see the rise of new classes of personal connected devices. These devices leverage the miniaturized, high-performance, low-cost, low-power component solutions created by the smartphone industry. Wearables, devices that are attached to our bodies, as well as nearables, devices that are near our bodies, are becoming more ubiquitous.

Health applications are among the key drivers for the rise of the wearables and nearables. Health devices include activity and wellness trackers, personal medical monitors, and environmental monitors. While these devices may not provide the detail and accuracy provided by medical devices at the hospital, they provide frequent, often continuous monitoring of multiple physiological and environmental parameters that can be used to monitor and manage our health.

A number of industries, including, news and entertainment, banking, retail, and transportation have been significantly and permanently transformed by the smartphone. The health industry is poised for a significant transformation as well. Wearables and nearables, in addition to the smartphone, will play a key role in the transformation of the health industry.

### Biography

Yong Jin Lee is currently Senior Vice President responsible for developing new devices at Samsung's Mobile Communications Business, including the development of wearables and nearables for health and wellness. Previously, he was responsible for Samsung's digital health program. He oversaw the development of the Samsung Health platform and the advanced health-related sensors on smartphones and wearables.

Prior to Samsung, Dr. Lee was the CTO and SVP of Engineering at Salutron. Dr. Lee was the principal investigator for over a dozen research programs on physiological monitoring and wearable devices for NASA, DARPA, Office of Secretary of Defense, US Army Medical Research, Office of Naval Research, and Department of Homeland Security. Dr. Lee was also at Veeco and Texas Instruments.

Dr. Lee holds BS, MS and PhD degrees in Electrical Engineering, AB in Economics, and MS in Engineering management, all from Stanford University. Dr. Lee is a recipient of F.E. Terman Award, and member of Tau Beta Pi, and Phi Beta Kappa honor societies.

## Daniel Rueckert, Ph.D.

### Imaging the Developing Brain – An overview of the Developing Human Connectome Project (DHCP)

Saturday, July 15, 2017, 13:20-14:10, Roentgen Hall

**Abstract**

Few advances in neuroscience could have as much impact as a precise global description of human brain connectivity (connectome) and its variability. Understanding this connectome in detail will provide insights into fundamental neural processes and intractable neuropsychiatric diseases. Currently, the connectome of the mature adult brain is in progress. The Developing Human Connectome Project (dHCP) aims to make major scientific progress by creating the first 4-dimensional connectome of early life. Our goal is to create a dynamic map of human brain connectivity from 20 to 44 weeks post-conceptional age, which will link together imaging, clinical, behavioral, and genetic information. This unique setting, with imaging and collateral data in an expandable open-source informatics structure, will permit wide use by the scientific community, and to undertake pioneer studies into normal and abnormal development by studying well-phenotyped and genotyped group of infants with specific genetic and environmental risks that could lead to Autistic Spectrum Disorder or Cerebral Palsy.

**Biography**

Professor Daniel Rueckert is Head of the Department of Computing at Imperial College London. He joined the Department of Computing as a lecturer in 1999 and became senior lecturer in 2003. Since 2005 he is Professor of Visual Information Processing and leads the Biomedical Image Analysis group. He received a Diploma in Computer Science (equiv to M.Sc.) from the Technical University Berlin and a Ph.D. in Computer Science from Imperial College London. Before moving to Imperial College, he has worked as a post-doctoral research fellow in the Division of Radiological Sciences and Medical Engineering, King's College London where he has worked on the development of non-rigid registration algorithms for the compensation of tissue motion and deformation. The developed registration techniques have been successfully used for the non-rigid registration of various anatomical structures, including in the breast, liver, heart and brain and are currently commercialized by IXICO, an Imperial College spin-out company. During his doctoral and post-doctoral research, he has published more than 400 journal and conference articles. Professor Rueckert is an associate editor of IEEE Transactions on Medical Imaging, a member of the editorial board of Medical Image Analysis, Image & Vision Computing and a referee for a number of international medical imaging journals and conferences. He has served as a member of the organizing and program committees at numerous conferences, e.g. he has been General Co-chair of MMBIA 2006 and FIMH 2013 as well as Program Co-Chair of MICCAI 2009, ISBI 2012 and WBIR 2012. In 2014, he has been elected as a Fellow of the MICCAI society and in 2015 he was elected as a Fellow of the Royal Academy of Engineering and as fellow of the IEEE.

# Esmaiel Jabbari, Ph.D.

## NanoBioTechnology Commercialization

Saturday, July 15, 2017, 13:20-14:10, Cho Room

## Abstract

Nanobiotechnology is poised to shape the sustainability of industries and wealth of nations, and transform economies and societies on a global scale. The global market for nanomedicine was $250 billion in 2014 and it is expected to reach $550 billion by 2020. Nanotechnology is the solution to detection, diagnosis, and treatment of many diseases as biological processes and cellular mechanisms work at the nanoscale. Translation of nanoscale discoveries from the laboratory to the market promises new diagnostic tools and robotic devices, drug targeting systems, gene therapy platforms, biomaterials, regenerative tissue constructs, and personalized medicine. Although most scientists recognize the molecular scale complexity of their discoveries and innovations, they have less appreciation for the expertise required to develop their biotechnologies into a marketable product. This presentation highlights recent advances and challenges in commercialization of nanotechnologies in the healthcare market from innovation to the protection of intellectual property, financing of research and development, standardization for quality control, regulatory process for clinical evaluation, product safety and environmental issues, challenges in evaluation of toxicity and regulation of nanomaterials, and business models for commercialization of nanotechnologies in the healthcare market. This presentation will cover fundamental concepts and risks involved in commercialization of diagnostic devices, drug and gene delivery systems, and constructs for tissue regeneration.

## Biography

Dr. Jabbari is a Tenured Full Professor of Chemical and Biomedical Engineering and the Director of Biomaterials, Tissue Engineering and Drug Delivery at the University of South Carolina. He earned his Ph.D. from Purdue University in Chemical Engineering. He began his independent career as an Assistant Professor in the Departments of Biomedical Engineering and Orthopedic Research at Mayo Clinic upon completion of his post-doctoral training at Monsanto and Rice University. Jabbari's research is focused on engineering 3D multi-cellular co-culture systems and the effect of spatiotemporal delivery of growth factors and physico-mechanical factors in the microenvironment on function and fate of stem cells for applications in skeletal tissue regeneration and cancer stem cell therapy. He received the Berton Rahn Award from the AO Foundation in 2012 and the Stephen Milam Award from the Oral and Maxillofacial Surgery Foundation in 2008. He was elected to the College of Fellows of the American Institute for Medical and Biological Engineering (AIMBE) in 2013. He has published ›250 books, book chapters, refereed journal articles (107 peer-reviewed), and conference proceedings, and presented ›260 seminars at national and international conferences (67 plenary, keynote, and invited seminars). He currently serves as the Technical Chair as well as the Programming Chair for Bionanotechnology theme of the annual conference of Engineering in Medicine & Biology Society (IEE-EMBS). He serves as the Academic Editor for PLOS ONE, Editor of International Journal of Biomaterials, and North America Editor of Journal of Biomaterials and Tissue Engineering. Dr. Jabbari has mentored ›130 visiting scholars, medical residents, post-doctoral scientists, and engineering students. He is a member of numerous scientific organizations including AIChE, BMES, ACS, EMBS, SFB, TERMIS, MRS, ACS, and AACR.

## *Early Career Achievement Award*

**Chulhong Kim**

*Pohang University of Science and Technology*

*"For contributions to multi-scale photoacoustic imaging from super-resolution atomic force photoactivated microscopy for research to systems for clinical applications."*

Nominated by: Yongmin Kim
*Pohang University of Science and Technology*

# Academic Career Achievement Award



### Nitish Thakor
*John Hopkins University*

*"For life long achievements in the fields of biomedical instrumentation and signal processing, neuroprosthesis and neuroengineering, demonstrated through awards, publication, translational activities, and leadership in the society's conferences and editorial activities."*

Nominated by: John Webster
*University of Wisconsin*

# 2017 EMBS AWARDS

EMBC'17
JeJu, Korea

## William J. Morlock Award



### Ali Khademhosseini
*Brigham and Women's Hospital*

*"For innovative contributions in engineering micro and nanoscale sensors, organ on a chip systems and advanced materials for tissue engineering and regenerative medicine applications."*

Nominated by: Mehmet Remzi Dokmeci
*Massachusetts Institute of Technology*

## Professional Career Achievement Award



### Karl E. Friedl

*U.S. Army Research Institute of Environmental Medicine*

*"In recognition of his technical contributions in metabolic monitoring, physiological status monitoring, and neuropsychological assessments as a biomedical researcher and technical leader in the military, government, academia, and professional societies."*

Nominated by: Jeffrey Palmer
*Massachusetts Institute of Technology*

## Technical Achievement Award



**Anant Madabhushi**
*Case Western Reserve University*

*"For contributions in computer aided diagnosis, pattern recognition, machine learning and image analysis tools for diagnosis, prognosis, and treatment response prediction of disease from digital pathology and radiographic images."*

Nominated by: Atam P. Dhawan
*New Jersey Institute of Technology*

## Technical Achievement Award



### Guang-Zhong Yang
*Imperial College London*

*"For outstanding contributions to medical imaging and robotics technology that have transformed minimally invasive surgery."*

Nominated by: Zhi-Pei Liang
*University of Illinois*

## 2017 Student Chapter Awards

### Best New Student Branch Chapter Award
### KSRCT IEEE - EMBS Student Branch Chapter, India

This Branch Chapter was established on 29th April 2015, our branch chapter strive to serve the student community in terms of providing technical knowledge, leadership skills and professional practices by offering technical workshop in the field of biomedical, knowledge sharing sessions, one credit courses in collaboration with renowned Biotech companies. To enhance leadership qualities, the branch chapter offers the student members to organize frequent forums such as idea sharing programmes, members meeting and membership campaigns.

The branch chapter contributes in a distinctive way to offer Professional development practices to the members through Distinguished lecture Programme. Dr. Bernard Allan Cohen, Ethics & Professional Responsibility Committee of IEEE-EMBS empowered the members with his valuable lecture on Enhanced Professional Stature through Ethical Mindset for Biotechnologist.

The service of the branch chapter do not ends with the technical contribution. The branch chapter has functioning with Public Awareness Club (PMC), Press and Media Club (PAC) and Health club. The members are actively involved with great dedication and determination in creating awareness on most important developmental issues including awareness on cancer and diabetes in collaboration with the regional health concerns for the benefit of public and the rural school children. The branch chapter releases Newsletter biannually. It emphasizes the branch chapter activities, EMBS news, general articles and forth coming events.

*Branch Chapter Advisor:* **Dr. P. Ponmurugan**
*Chair: Dr.* **B. Shanthanaraj**
*Vice-Chair:* **Dr. K.B. Jayanthi**
*Branch Chapter Councilor:* **Ms. S. Poornima**

## 2017 Student Chapter Awards

### Outstanding Performance by a Student Chapter Club Award
### Carleton University EMB Student Club

*The Carleton University Engineering in Medicine and Biology Society Student Club (CU@EMBS) was created in 2010 to bridge EMBS to Carleton University new biomedical engineering programs. Since its inception, CU@EMBS has promoted biomedical engineering and knowledge dissemination, most notably through a seminar series with professors and students alike to ensure that the biomedical engineering community at Carleton is well connected and to provide a framework within, which latest advancements are shared and celebrated. The club's efforts were recognized in 2011 by EMBS with the Outstanding Performance Award (OPA). The club has since maintained its excellence and in 2016 held an International Student Conference (ISC) which is part of EMBS initiative to engage students and young professionals with the society. ISC 2016 was a tremendous success and the first student conference to have its proceedings published in IEEE Xplore. It attracted over 150 attendees and held various workshops and keynote sessions. The club has again been recognized for its excellence by winning the 2017 OPA. The award will serve as a platform to propel the club into further excellence.*
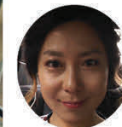
# IEEE Biomedical Engineering Award



## Bin He

*The pioneering work of Bin He has transformed electroencephalography (EEG) from a one-dimensional detection modality to an important noninvasive three-dimensional neuroimaging tool for brain research and management of brain disorders. He developed anatomically constrained brain source localization by introducing the boundary element method, which has significantly advanced the field of multimodal neuroimaging. He has changed the understanding of what noninvasive brain-computer interfaces (BCIs) can do. Using an array of electrode sensors placed over the scalp, He developed novel BCI techniques to demonstrate that a human can control the flight of a drone with their mind through reading the EEG signals. His neuroimaging innovations are playing an important role in the diagnosis and management of disorders including epilepsy, stroke, and Alzheimer's disease.*

*An IEEE Fellow, he is the Distinguished McKnight University Professor of Biomedical Engineering and Director of the Institute for Engineering in Medicine at the University of Minnesota, Minneapolis, MN, USA.*

# IEEE Medal for Innovations in Healthcare Technology



## Yulun Wang

The innovations of Yulun Wang concerning remotely operated surgical robots and his development and application of telemedicine systems have improved the quality of healthcare around the world, providing care to patients who otherwise would not have access and lowering the costs of treatment. Pursuing his vision that surgical robotic tools could enable surgeons to perform procedures with increased dexterity and control compared to conventional hand-held instruments, Wang brought medical robots to mainstream research and development and established the role of the surgical robot for minimally invasive surgery. Surgical robots provide the advantages of precision, smaller incisions, decreased blood loss, less pain, and quicker healing time for patients undergoing robotic-assisted surgeries. Wang invented the Automated Endoscopic System for Optical Positioning (AESOP). AESOP is a voice-controlled robotic arm that can hold and move a laparoscope for a surgeon, and it was the first FDA-cleared surgical robot. He also developed the ZEUS robotic surgical system, which performed the world's first trans-Atlantic surgery. Many of the technical innovations developed for ZEUS were incorporated into the very popular da Vinci surgical robot. To improve patient access to quality treatment and to fight the rising costs of healthcare, Wang created the first remote-presence robotic system to enable a clinician to be in two places at one time to perform medical triaging, diagnosis, and consultations from a distance. He applied this system to a tele-stroke treatment network in which a hub hospital places remote presence robots in smaller spoke hospitals to provide these hospitals and their patients with access to stroke specialists who can remotely examine and care for stroke victims. Wang's telemedicine system has also been used for intensive care and psychiatric clinical consults. The surgical robotics and telemedicine innovations that Wang helped to develop have now benefited several million patients—and are continuing to help over a million patients every year.

A member of the U.S. National Academy of Engineering and recipient of the 2005 Innovation Award from the American Telemedicine Association, Wang is chairman and founder of InTouch Health, Goleta, CA, USA.

# 2017 EMBS AWARDS

EMBC'17
JeJu, Korea

## 2017 IEEE Newly Elected Fellows

**Jose Carmena**
University of California, Berkeley
*"for contributions to the neural basis of motor skill learning and neuroprosthetic systems"*

**Pablo Estevez**
University of Chile
*"for contributions to feature selection and visualization of large data sets"*

**Saman Halgamuge**
Australian National University
*"for contributions to computational intelligence in bioinformatics and mechatronics"*

**Akimasa Hirata**
Nagoya Institute of Technology
*"for contributions to safety assessment and standardization of human exposure to electromagnetic fields"*

**Jiang Hsieh**
University of Wisconsin Madison
*"for contributions to X-ray computed tomography for clinical applications"*

**Xin Li**
Carnegie Mellon University
*"for contributions to image coding, restoration, and interpolation"*

**Donald Lie**
Texas Tech University
*"for contributions to high linearity and high efficiency silicon RF power amplifiers for broadband wireless applications"*

**Wentai Liu**
UCLA
*"for contributions to electronically-aided neural prosthetic devices"*

**Jose Del R. Millan**
École polytechnique fédérale de Lausanne
*"for contributions to brain-controlled robots"*

**Srikantan Nagarajan**
University of California, San Francisco
*"for contributions to neural engineering and biomagnetic brain imaging"*

**Aydogan Ozcan**
UCLA
*"for contributions to iophotonics, computational imaging, and sensing for telemedicine and global health"*

**Leif Sornmo**
Lund University
*"for contributions to biomedical signal processing in cardiac applications"*

**James Weiland**
University of Southern California
*"for contributions to the design, development, and realization of retinal prostheses"*

# 2017 EMBS AWARDS

## EMBS Past Award Recipients

### Professional Career Achievement Awards

- 2017: Karl E. Friedl
- 2015: Matthew O'Donnell
- 2011: Yongmin Kim
- 2009: Luke Lee
- 1979: Robert Plonsey
- 1974: Dean L. Franklin
- 1973: Donald F. Childers
- 1968: Wilson Greatbatch
- 1967: Herman Schwan
- 1963: Otto Schmitt
- 1961: Britton Chance
- 1956: Edward F. MacNichol

### Academic Career Achievement Awards

- 2017: Nitish Thakor
- 2016: Maryellen Giger
- 2015: Bin He
- 2014: Max A. Viergever
- 2013: Theodore W. Berger
- 2012: Peter Hunter
- 2011: K. Kirk Shung
- 2010: Robert S. Langer
- 2009: Sergio Cerutti
- 2008: Roger Barr
- 2007: Jose Principe
- 2006: Jean-Louis Coatrieux
- 2005: Ewart Carson
- 2004: Michael R. Neuman
- 2003: Ante Santic
- 2002: Willis J. Tompkins
- 2001: John G. Webster
- 2000: Max Schaldach
- 1999: Fernand A. Roberge
- 1997: J. Lawrence Katz
- 1996: Max E. Valentinuzzi
- 1995: Floyd Dunn
- 1994: Wilson Greatbatch
- 1993: John M. Reid
- 1992: Edwin L. Carstensen

### Early Career Achievement Award

- 2017: Chulhong Kim
- 2016: Lei Ding
- 2015: Danielle S. Bassett
- 2014: Qi Wang
- 2013: Muhammad H. Zaman
- 2012: Utkan Demirci
- 2011: Jose M. Carmena
- 2010: Dario Farina
- 2009: Silvestro Micera
- 2008: Ali Khademhosseini
- 2007: Tejal Desai
- 2006: Alejandro Frangi
- 2005: Stephen Boppart
- 2004: Susan Hagness
- 2003: Paolo Vicini
- 2002: Dorin Panescu
- 2001: David Beebe
- 2000: James Collins
- 1999: Zhi-Pei Liang
- 1997: Metin Akay
- 1996: Joan E. Sanders
- 1995: Atam P. Dhawan
- 1993: Rory A. Cooper
- 1992: Yitzhak Mendelson
- 1991: Blake Hannaford
- 1990: Janie M. Fouke
- 1988: Yongmin Kim
- 1986: George V. Kondraske

# 2017 EMBS AWARDS

## EMBS Past Award Recipients

### William J. Morlock Award

- 2017: Ali Khademosseini
- 2012: Reese S. Terry, Jr.
- 2011: Rahul Mehra
- 2010: Mark Kroll
- 2009: Dorin Panescu

### Distinguished Service Award

- 2016: Bruce Wheeler
- 2015: Zhi-Pei Liang
- 2014: Bin He
- 2013: Donna Hudson
- 2011: Maximus A. Viergever
- 2010: Yongmin Kim
- 2009: John W. Clark Jr.
- 2008: Henrietta Galiana
- 2007: Nathalie Gosset
- 2006: Yuan-Ting Zhang
- 2005: Jose Principe
- 2004: John Enderle
- 2003: Christian Roux
- 2002: Swamy Laxminarayan
- 2001: Metin Akay
- 2000: Jack Iverson
- 1999: Jean–Louis Coatrieux
- 1998: Susan M. Blanchard
- 1996: Michael R. Neuman
- 1995: Charles Robinson
- 1994: Barry Feinberg
- 1993: Eli Fromme
- 1992: Swamy Laxminarayan
- 1990: Alvin Wald
- 1983: Eli Fromme

### Technical Field Awards

- 2017: Guang-Zhong Yang
- 2017: Anant Madabhushi
- 2016: Stephen Boppart
- 2016: Jeffrey Fessler
- 2015: Nigell Lovell
- 2015: Russell H. Taylor
- 2014: Brian T. Cunningham
- 2014: Zhi-Pei Liang
- 2013: Nicolas Chbat
- 2013: Ali Khademhosseini
- 2012: Rashid Bashir
- 2011: Michael Unser
- 2011: Lihong Wang
- 2010: Xiaochuan Pan
- 2010: Kenji Sunagawa
- 2010: Nitish Thakor

# 2017 EMBS AWARDS

**EMBC'17**
**JeJu, Korea**

*IEEE*  ⬥EMB

## 2017 EMBC Student Paper Competition

### Geographic Finalists

***North America***
**Soojin Lee**
The University of British Columbia
*Galvanic Vestibular Stimulation (GVS) Effects on Impaired Interhemispheric Connectivity in Parkinson's Disease*

***Europe***
**Jonathan Castelli**
University of Bordeaux
*An IC-Based Controllable Stimulator for Respiratory Muscle Stimulation Investigations*

***Asia –Pacific***
**Mi Kyung Kim**
Korea Advanced Institute of Science and Technology (KAIST)
*Implantable Bladder Volume Sensor Based on Resistor Ladder Network Composed of Conductive Hydrogel Composite*

***Middle East- Africa***
**Meena M. Makary**
Cairo University
*Self-Regulation of Primary Motor Cortex Activity with Motor Imagery Induces Functional Connectivity Modulation: A Real-Time fMRI Neurofeedback Study*

# 2017 EMBS AWARDS

EMBC'17
JeJu, Korea

## 2017 EMBC Student Paper Competition

### Open Finalists

**Yafen Chen**
University of Oklahoma
*Assessing Rtms Effects in MdDS: Cross-Modal Comparison between Resting State EEG and Fmri Connectivity*

**Andreas Ejupi**
Simon Fraser University
*Accuracy of a Wavelet-Based Fall Detection Approach Using an Accelerometer and a Barometric Pressure Sensor*

**Nikolaos Karamolegkos**
Columbia University
*Effects of Septum and Pericardium on Heart-Lung Interactions in a Cardiopulmonary Simulation Model*

**Eli Kinney-Lang**
University of Edinburgh
*Elucidating Age-Specific Patterns from Background Electroencephalogram Pediatric Data Sets Via PARAFAC*

**Julia Koch**
University of Freiburg
*Design of Contact Zone Topography for Implantable High-Channel Electrical Connectors*

**Yeganeh M. Marghi**
Northeastern University
*EEG-Guided Robotic Mirror Therapy System for Lower Limb Rehabilitation*

**Nicholas Marjanovic**
University of Illinois at Chicago
*Wireless Wearable User Interface Cursor-Controller (UIC-C)*

**Christine F Martindale**
Friedrich-Alexander-Universität Erlangen-Nürnberg
*Segmentation of Gait Sequences Using Inertial Sensor Data in Hereditary Spastic Paraplegia*

**Takayuki Mukaeda**
Yokohama National University
*A Novel Hidden Markov Model-Based Pattern Discrimination Method with the Anomaly Detection for EMG Signals*

**Soichiro Fujimura**
Tokyo University of Science
*Effect of Catheter Positions on Hemodynamics and Coil Formation after Coil Embolization*

**Gabriela Torres**
University of North Carolina, Chapel Hill & North Carolina State University
*ARFI Variance of Acceleration (VoA) for Noninvasive Characterization of Human Carotid Plaques in Vivo*

## 2016 EMBC Student Paper Competition Award Recipients (Recognition Orlando, Florida)
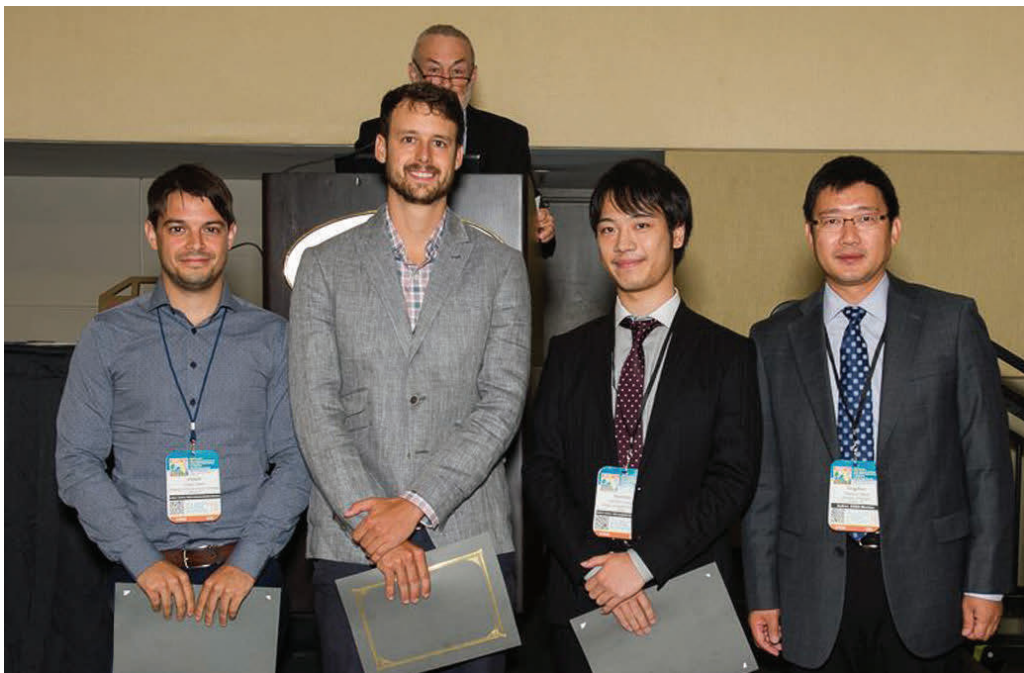


**EMBS Student Paper Competition Award Recipient:**
**Soichiro Fujimura**
*Tokyo University of Science*

**Second Place Award Recipient:**
**Max Sheppard**
*Northwestern University*

**Third Place Award Recipient:**
**Joseph DeGol**
*University of illinois*

# Session Code Explanation

The main conference program is run over four days and divided into a number of time slots and tracks. Note the there are approximately 18 parallel tracks running at EMBC 2017 spanning all 13 scientific themes.

A session code will therefore have the following format:

| Day | Time Slot | Track |
|-----|-----------|-------|
| We  | A         | T1    |
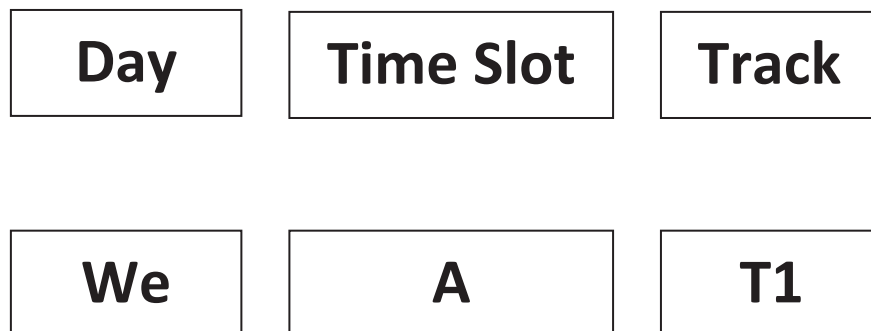
- WeAT1     This is an oral session designating the 'A' time slot on Wednesday (8:00-9:30) for track '1'.

All posters have been scheduled for an Ignite session on the day that your poster has been assigned. (Please verify your date and time)

Ignite Sessions Day & Time: Wednesday, Thursday and Friday 16:10 – 17:10.

Poster Sessions Day & Time: Wednesday, Thursday and Friday 17:20 – 18:50.

# EMBC '17 Floor Plan

**5F**
Röntgen Hall
Einthoven Hall
Montgomery Hall
Ocean View

**4F**
Schmitt Room
Zworykin Room
Herrick Room
Schwan Room
Plonsey Room

**3F**
Cho Room
Park Room
Min Room
Lee Room
Geddes Room
Dunn Room
Schaldach Room
Greatbatch Room
Webster Room
Rushmer Room

**2F**
Meeting Room #201
Meeting Room #202

**1F**
Galvani Hall

# 1F – Floor Layout

# 2F – Floor Layout



Meeting Room #201

Meeting Room #201

# 3F – Floor Layout

Schaldash Room | Speaker Room | Greatbatch Room | Webster Room

Dunn Room

Geddes Room

Rushmer Room

Escalator
To 4th Floor

Cho Room | Park Room

Min Room | Lee Room

Registration

Clinic Center

Escalator
To Galvani Hall (1F)

Escalator
To 5th Floor
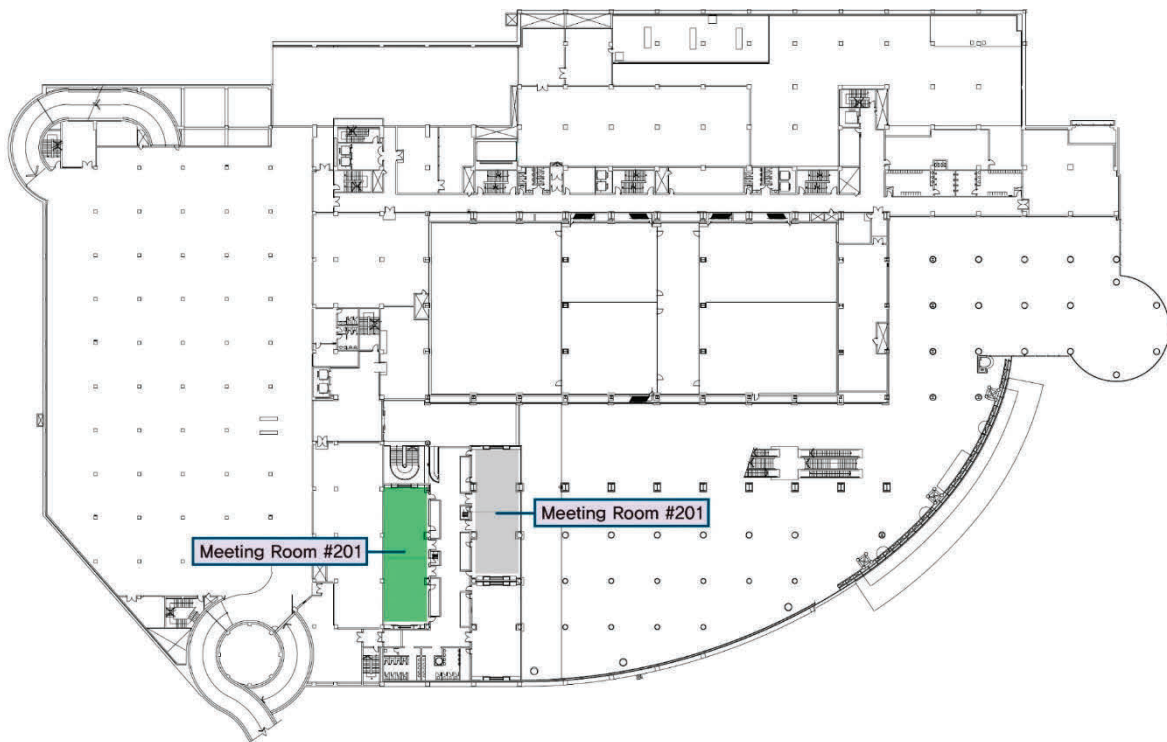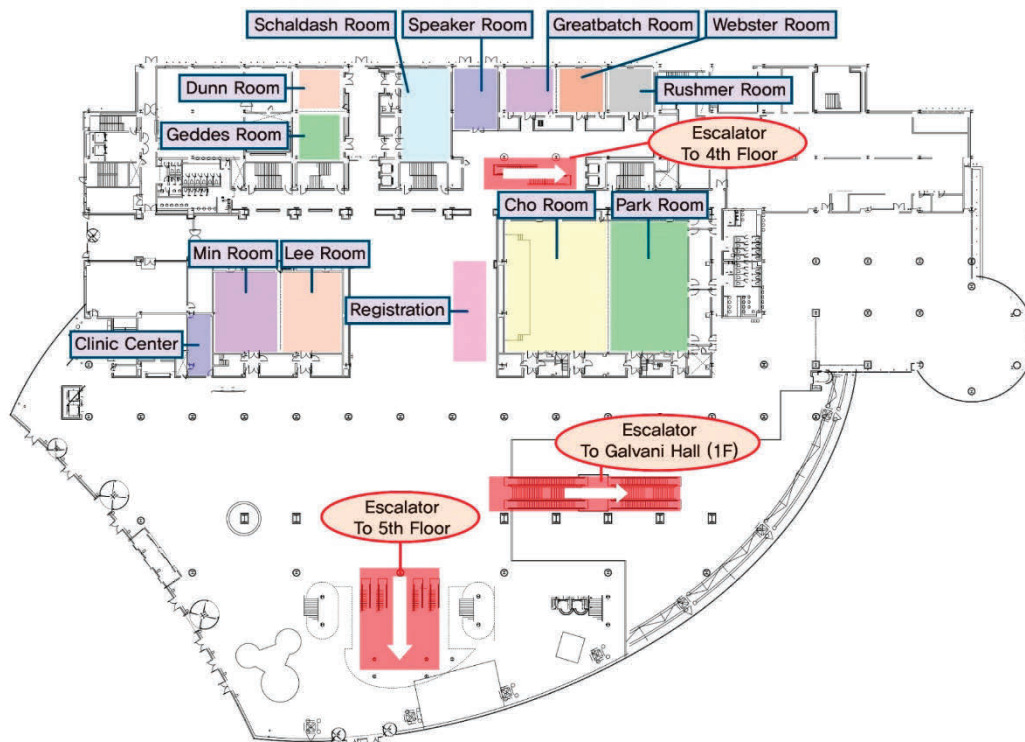
# 4F – Floor Layout

# 5F – Floor Layout



Montgomery Hall | Einthoven Hall | Röntgen Hall | Ocean View

Escalator To 3th Floor
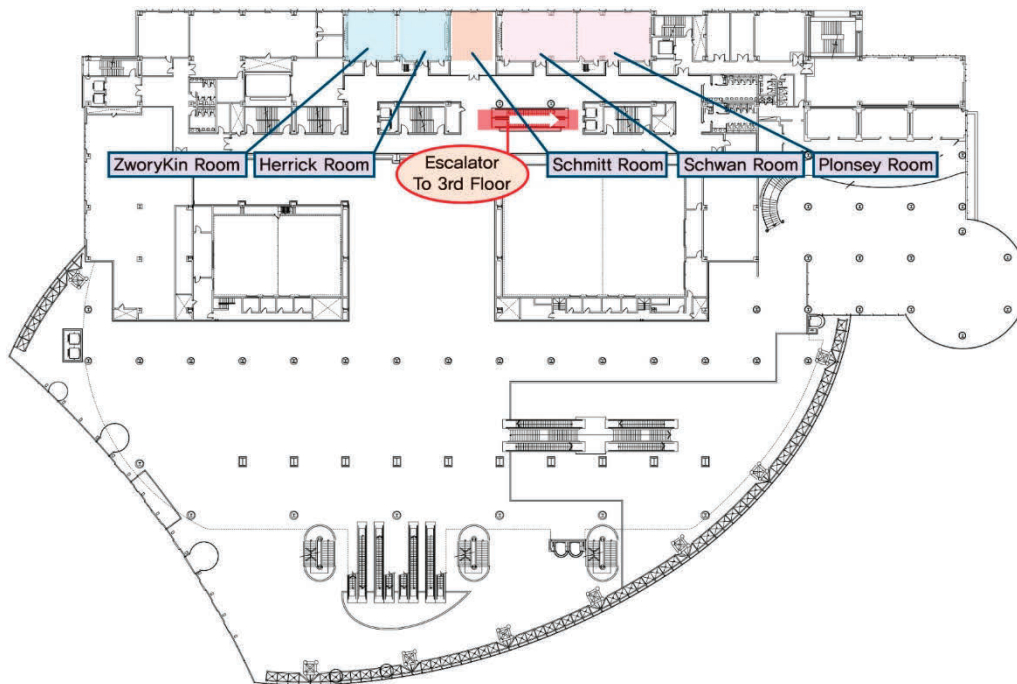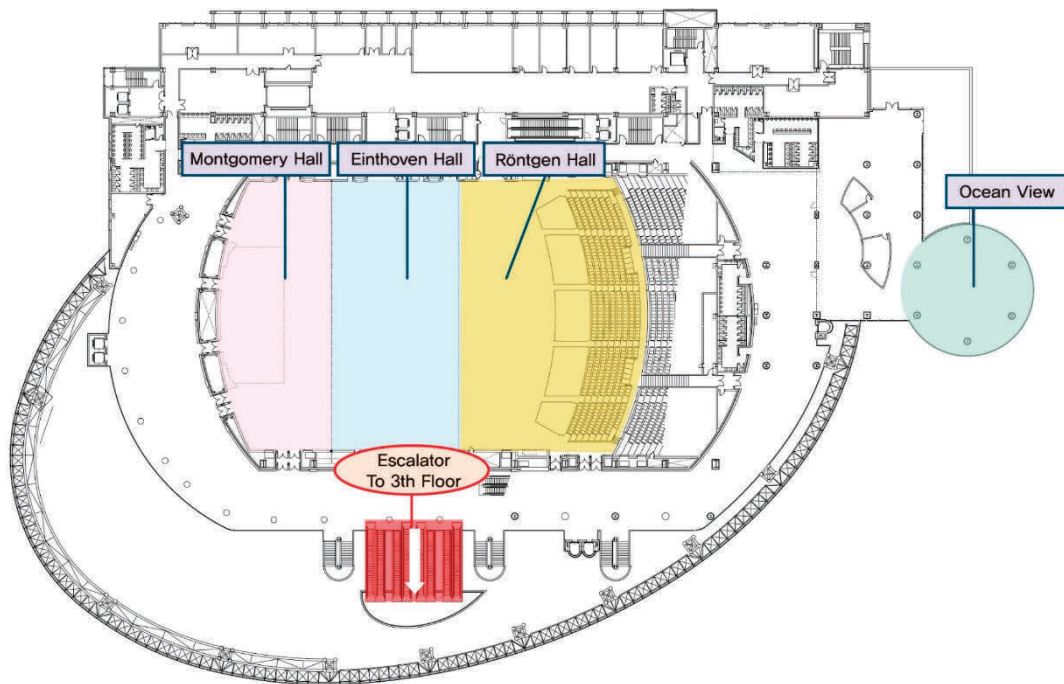
# EMBS/KOSOMBE Pioneers

EMBC2017 has named the conference rooms after EMBS/KOSOMBE pioneers to commemorate
their contributions to society and the biomedical engineering profession

## Cho, Zang Hee

- **1936 –**
- Korean Biomedical Engineer and Neuroscientist
- Korea Advanced Institute of Science & Technology

- **Medical Imaging**
- **1st Ring-PET Scanner**

He devoted his whole career for the progress of neuroscience by the development of tomographic medical imaging technologies. He developed the first Ring-PET scanner, by which most of current PET systems reconstruct PET images. And he developed the first scintillation detector BGO and the first 2.0 Tesla MRI. More recently, he developed the first PET-MRI fusion molecular imaging device for neuro-molecular imaging.

## Dunn, Floyd

- **1924 – 2015**
- American Biomedical Engineer
- University of Illinois, Urbana Champaign

- **Ultrasound and Bioacoustics**
- **Career Achievement Award** 1995

He was a groundbreaking pioneer in ultrasound and bioacoustics. He was **the first** to show the diagnostic ultrasonic images of tissue structures and their pathologies, quantify in vivo temperature-dependent ultrasonic absorption coefficients, and recognize the need for quantitative measurements of the nonlinearity parameter in biological materials. The widespread & beneficial use of diagnostic ultrasound could not have occurred without his work on safety assurance.

## Einthoven, Willem
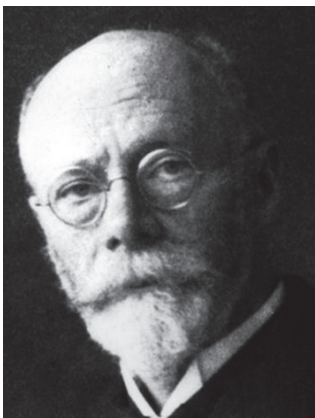
- **1860 – 1927**
- Dutch Physician and Physiologist
- University of Leiden

- **Invented ECG**
- **Nobel Prize in Physiology or Medicine 1924**

He is best known for designing the string galvanometer. This instrument detected and recorded visual traces of the heart's electrical activities. During the 20th century, this technique, known as ECG, diagnosed numerous heart conditions and diseases. Much of the terminology used in describing an ECG originated with Einthoven. His letter assignments, P, Q, R, S and T, to the various deflections are still used. The term Einthoven's triangle is named for him.

## Galvani, Luigi A.
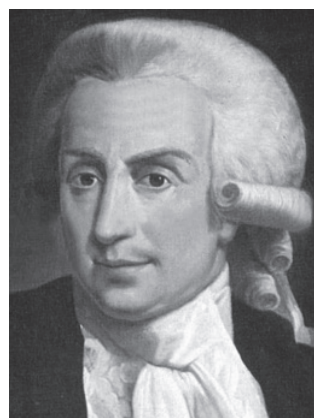
- **1737 – 1798**
- Italian Physician, Physicist, Biologist and Philosopher
- University of Bologna

- **Discovered Bioelectricity**

He discovered animal electricity and recognized as the pioneer of bioelectromagnetics. In 1780, he discovered that the muscles of dead frogs' legs twitched when struck by an electrical spark. This was one of the first forays into the study of bioelectricity, a field that still studies the electrical patterns and signals from tissues such as the nerves and muscles.

# Geddes, Leslie A.
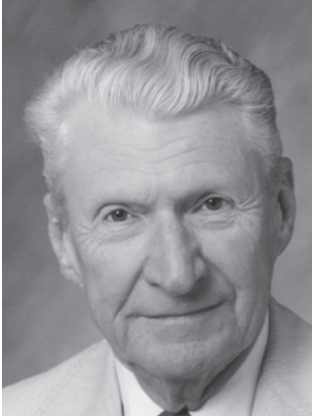
- **1921 – 2009**
- British/American Biomedical Engineer and Physiologist
- Purdue University

- **Biomedical Instrumentation**
- **Career Achievement Award** 1986

He combined electrical and physiological principles in biomedical research, including electromyography, cardiac output, cardiac pacing, ventricular defibrillation, and blood pressure. He identified & demonstrated the optimal sites on the chest for defibrillation or pacing. His extensive contributions to the direct and indirect measurements of blood pressure laid the foundation for the worldwide acceptance of the oscillometric method of blood pressure measurements.

# Greatbatch, Wilson

- **1919 – 2011**
- American Biomedical Engineer
- Taber Instrument Co.

- **1st Implantable Pacemaker**
- **Career Achievement Award** 1968,1994

He is best remembered for the invention and development of the first implantable pacemaker. In an attempt to record the sound of a heartbeat, he inadvertently created something far more crucial, a device that emitted electrical pulses to the heart. He patented and licensed his invention to Medtronic, and the first pacemaker was implanted in a human in 1960. He upgraded his device with a lithium iodine battery for durability in 1970, and his invention has been saving numerous lives ever since.

# Herrick, Julia F.

- **1893-1979**
- American Biophysicist
- Mayo Clinic, Section of Biophysics and Biophysical Research

- **Medical Ultrasonics**
- **EMBS President** 1954
- **1st Editor of EMBS Journal**

Her main research field was medical ultrasonics and microwave diathermy. Dr. Herrick very kindly accepted the position of Editor for the IRE Transactions on Medical Electronics, the first EMBS journal, and made it the leading publication in the medical electronics field in 1953. She also served as the EMBS President in 1954.

# Lee, Sang Hoon

- **1960 – 2016**
- Korean Biomedical Engineer
- Korea University

- **Bionanotechnology**
- **1st Editor, BME Letters** 2011-16

He was a pioneering biomedical engineer in Korea. His research focused on nano-bio and sensor technologies and published in top journals including 'Nature'. He also possessed the great passion in biomedical engineering education and developed the BME programs in Korea University and Dankook University. He served as the 1st Editor-in-Chief of 'Biomedical Engineering Letters', the official English Journal of KOSOMBE.

# **Min,** Byoung Goo

- **1942 –**
- Korean Biomedical Engineer
- Seoul National University

- **Artificial Organs**
- **KOSOMBE President** 1996/97

He was a pioneer and leader in artificial organs. Since the success of the 1st animal experiment of a moving-actuator type electromechanical total artificial heart in 1988, his whole carrier was devoted to the development of artificial pumping devices, including ventricular assisted devices and extracorporeal membrane oxygenators. He also built the 1st biomedical engineering graduate program at Seoul National University.

# **Montgomery,** L. H. Jr.

- American Biomedical Engineer
- Vanderbilt University School of Medicine

- **Artificial Respirator**
- **1st EMBS President** 1952/53

In 1952, he led a group of electronics engineers, members of the Institute of Radio Engineers and established an **IRE Professional Group on Medical Electronics**. It grew steadily and expanded its area of interest. It eventually merged with the AIEE Committee on Electrical Techniques in Medicine and Biology to IEEE Professional Group on Medical Electronics in 1963. It was renamed to the IEEE EMBS in 1968. He also served as the first EMBS President in 1952/53.

# **Park,** Sang Hee

- **1939 –**
- Korean Biomedical Engineer
- Yonsei University

- **Biosignal Processing**
- **1st Editor, KOSOMBE Journal** 1979
- **KOSOMBE President** 1992/93

He organized the 1st meeting on Biomedical Engineering in Korea in 1974. Since then, he continued the efforts to encourage and promote this rapidly emerging field. He is the founding father of Korean Society of Medical and Biological Engineering. His research was focused on bioelectrical signal processing and analysis. He served as the 1st Editor-in-Chief of the official journal of KOSOMBE, which is now renamed as 'Journal of Biomedical Engineering Research'.

# **Plonsey,** Robert

- **1924 – 2015**
- American Biomedical Engineering
- Duke University

- **Bioelectric Modeling**
- **EMBS President** 1973,74
- **1st IEEE BME Award** 2013

His research centered on bioelectric phenomena, including the electrical activity of nerves and muscle. He derived mathematical relationships between the transmembrane potential and the extracellular potential and the electrical properties of the heart. He developed the bidomain model and a hypothesis on the mechanism for defibrillation.

# Roentgen, Wilhelm C.

- **1845 – 1923**
- German/Dutch Physicist
- University of Würzburg
- University of Munich

- **Discovered X-ray**
- **1st Nobel Prize in Physics 1901**

His most significant work was, undoubtedly, the discovery of X-rays, a form of electromagnetic radiations, and he observed an illumination of barium platinocyanide covered screen. He also discovered the rays were capable of exposing a photographic plate. Through his discovery, he revolutionized the entire medical profession and set the foundation for diagnostic radiology and medical imaging. Today, he is considered the father of radiology, the medical field which uses imaging to screen, diagnose and monitor diseases.

# Rushmer, Robert F.
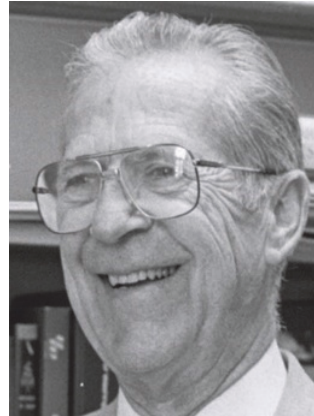
- **1914 – 2001**
- American Biomedical Engineer
- University of Washington

- **Cardiovascular Dynamics**
- **1st Portable Doppler Ultrasound**

He was a pioneer in applying engineering advances to medical research. His most notable achievements was the development of ultrasound for medical imaging and better tools for cardiovascular monitoring. He applied Doppler ultrasound to imaging the pumping heart and measuring blood flow. These devices were credited with reducing premature deaths from circulatory diseases and also modified to detect fetal heartbeats. His research led to the development of vibrant diagnostic and therapeutic ultrasound industry in Seattle over the last 40 years.

# Schaldach, Max

- **1936 – 2001**
- German Biomedical Engineer.
- Friedrich-Alexander University, Biotronik

- **Biomedical Technology**
- **Career Achievement Award** 2000

He was a leading researcher in the field of biomedical technology and a pioneer in pacemaker technology with the first German pacemaker and later fixing electrodes in the atrium. He discovered how implants support thrombus formation. Later, this finding led to the development of coronary stents with biocompatibility for long-term stability. He also developed a mobile remote monitoring system for the home monitoring of pacemakers or defibrillators.

# Schmitt, Otto Herbert

- **1913-1998**
- American Biomedical Engineer
- Univ. of Minnesota

- **Biomimetics**
- **EMBS President** 1962
- **Career Achievement Award** 1963, 87

He was known for his scientific and technical contributions to biophysics and for establishing the field of biomedical engineering. His research into squid nerves led to his early invention of the patented "**Schmitt Trigger**," used in billions of electronic systems. He invented the cathode follower, the differential amplifier, and the chopper-stabilized amplifier. He also coined the term "**Biomimetics**."

# Webster, John G.



- **1932 –**
- American Biomedical Engineer
- University of Wisconsin-Madison

- **Medical Instrumentation**
- **Career Achievement Award** 2001

He is a pioneer in the field of medical instrumentation. He research included electrodes for ablating liver to cure cancer, safety devices of electromuscular incapacitating and a miniature hot flash recorder. He first proposed the idea of electrical impedance tomography as a medical imaging technique. He has been the author and editor of many textbooks including the most-used textbook in biomedical engineering: "Medical Instrumentation: Application and Design", since its 1st edition in 1977.

# Schwan, Herman Paul



- **1915 – 2005**
- German/American Biomedical Engineer
- Univ. of Pennsylvania

- **EMBS President** 1960
- **Career Achievement Award** 1967

He did much to enhance the emerging field of biomedical engineering and developed its first Ph.D. program. He is best known for many studies related to electrical properties of cells and tissues, and on nonthermal mechanisms of interaction of fields with biological systems. He was a pioneer in recognizing the possible health hazards of nonionizing electromagnetic fields. He proposed a safe limit for human exposure to microwave energy of 100 W/m².

# Zworykin, Vladimir K.



- **1888 – 1982**
- Russian/American Biomedical Engineer
- Westinghouse/RCA

- **Electron Microscopy**
- **EMBS President** 1955/6
- **1st IFMBE President** 1959

He is known as "**the father of television**" since his fundamental inventions were the basic technologies of modern, electronic television. He experimented with infrared rays in order to develop devices that could "see" in darkness. He was a pioneer in electron microscopy and in medical applications of electronics. He was aware of the potential and importance of Biomedical Engineering and therefore worked out platforms for joint operations and collaboration of scientists and professionals.

# The IEEE Engineering in Medicine and Biology Society
## Mentor Program



Open to all EMBS members, our mentor program provides students and young professionals interested in the biomedical engineering profession with direct access to experienced mentors who can share valuable career guidance and advice, and contribute to professional and personal development. The program also provides experienced professionals with the opportunity to share their knowledge and inspire, encourage, and support future biomedical engineers.

### Mentors
(Professors, Industry Professionals)

Want to give back to your community? Serve as a role model, and provide guidance to the next generation of biomedical engineers.

Expand your own network, and connect with others in the field.

### Mentees
(Students/Young Professionals)

Have a question about one of the areas of Biomedical Engineering? Find a mentor who can explain and help you.

Network! Develop business contacts, access important industry information and activities, and gain valuable insights from experienced and successful professionals.

### Connect with us!

IEEE Engineering in Medicine and Biology Society
445 Hoes Lane
Piscataway, New Jersey, USA 08854
e-mail: emb-exec@ieee.org

## Curious? Don't take our word for it! Here's what some of our program participants are saying…

*"The EMBS mentoring program is fantastic. It allowed me to reconnect with the profession I love, and I so enjoy offering encouragement and sharing the lessons I've learned along the way with a very bright, up and coming biomedical engineer."*

*"My EMBS mentor is amazing! She helped me so much without being 'overly intrusive' and introduced me to some incredibly helpful industry resources and contacts, that will come in really handy during my job search."*

### Learn more and sign up now!

The mentor program is a valuable part of your membership in EMBS. Visit www.embs.chronus.com to get started.

There, you will find all the information you'll need, along with frequently asked questions for both mentees and mentors.

IEEE   EMB

Find us on:

# EMBS Career Center

## Connecting top talent to the best biomedical engineering jobs around the world.

No matter where you are in your career journey, whether you're trying to land your very first job, or if you've got years of experience under your belt, be sure to include EMBS' extensive network in your search.

**The EMBS Career Center is the place to start!**

We designed our Career Center with you in mind.
We connect our members with top employers around the world.

## Jobseekers

*View Jobs:* Access the newest and freshest jobs available to professionals seeking employment.

*Post an anonymous resume:* Post your resume online today! Whether you're actively or passively seeking work, your online resume is your ticket to great job offers.

*Personal Job Alerts:* Create Job Alerts and never let a matching job opportunity pass you by! New jobs that match your search criteria will be emailed directly to you.

*Create Job Seeker Account:* Log into your account to begin managing your job search. Create and manage job alerts and view job offers from employers.

## Employers

*Post a Job:* Reach the most qualified candidates by posting your job opening on our online Career Center.

*View the Resumes:* Check out resumes today! We connect you directly with the most talented professionals in biomedical engineering.

*Products and Pricing:* Regardless of your staffing needs or budget, we have a recruitment product that will fit your business.

*Access Your Account:* Log in to begin managing your online recruiting account. Post jobs to our site and browse candidates interested in your positions.

## Connecting Academia with Industry

Be sure to check out EMBS' regional career development opportunities, online resources, and special events. We're working hard to connect our members in academia with employers in biotech, medical device and pharmaceutical companies around the world.

## Questions? Let us hear from you! Send an email to emb-exec@ieee.org.

Visit *http://embs-jobs.careerwebsite.com/* to get started!     Find us on:

*civ*

# NIH-IEEE 2017 Special Topics Conference on Healthcare Innovations and Point of Care Technologies: Technology in Translation

**November 6-8, 2017**
**NIH Natcher Conference Center (Building 45), NIH Bethesda Campus, MD**

| Keynote and Panel Sessions | Breakout Sessions | FDA and Resources Session | Translation Demo Showcase | Student Paper & Design Competition |

**Organized and Co-Hosted By**
National Heart, Lung, and Blood Institute (NHLBI), National Institute of Biomedical Imaging and Bioengineering (NIBIB), National Cancer Institute (NCI), National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) Engineering in Medicine and Biology Society (EMBS), IEEE

**Conference Chairs**
- Atam Dhawan, PhD, NJIT
- George Mensah, MD, NHLBI, NIH

**Program Chairs**
- Tiffani Lash, PhD, NIBIB, NIH
- Steve Schachter, MD, CIMIT and Harvard Medical School
- Jue Chen, PhD, NHLBI, NIH

**International Program Chairs:**
- Paul Pearlman, PhD, NCI, NIH
- Thomas Penzel, PhD, Charite Universitätsmedizin Berlin, Germany
- Arturo Forner-Cordero, PhD, University of São Paulo, Brazil
- Brad Newsome, PhD, NHLBI, NIH
- Laura Povlich, PhD, FIC, NIH

**Student Paper/Design Competition Chairs:**
- Srini Tridanadpani, MD, PhD, Emory University
- Pamela Bhatti, PhD, Georgia Institute of Technology

**Organizing Committee**
- Jim Gallarda, PhD, Bill & Melinda Gates Foundation
- Erin Iturriaga, BS, MSN, NHLBI, NIH
- Amy Kraftt, PhD, NIAID, NIH
- Christine Kelley, PhD, NIBIB, NIH
- Mary Rodgers, PhD, NIBIB, NIH
- LeShawndra Price, PhD, NHLBI, NIH
- Ki Chon, PhD, University of Connecticut
- Dorin Panescu, PhD, Intuitive Surgicals
- Julian Goldman, MD, Partners HealthCare and Massachusetts General Hospital

## Call For Papers

The NIH-IEEE Strategic Conference will focus on healthcare innovations and point-of-care technologies for precision Health, and their clinical translation to address challenges in global healthcare. The proposed conference will provide a strategic forum with clinicians, healthcare providers, industry experts, innovators, researchers and students to define clinical needs and technology solutions towards commercialization and translation to precision medicine. Panel discussions and open forum sessions along with research presentations will focus on the development, clinical translational, commercialization, implementation and user-compliance of innovative healthcare and point-of-care technologies (POCT) in clinical (hospital, emergency, acute, chronic and primary care), non-traditional (consumer) and under-resourced settings. The overall goal of the strategic conference is to provide opportunities for stakeholders to explore collaborations and synergies to accelerate healthcare system development, validation, deployment and adoption of POCT for improving global healthcare at affordable cost.

Along with keynote speeches, panel discussions, and breakout sessions with leaders and stakeholders addressing clinical needs, enabling technologies, regulatory protocols, funding opportunities and business models, a limited number of oral and poster presentations will be included in the final program. We invite you to submit a one-page paper for oral presentation in the technical sessions or poster exhibit sessions in the following thematic areas. All submissions will be reviewed and selected one-page papers will be included in the Program Booklet. All papers presented at the Conference in their expanded required format will be considered for publication in the open-source IEEE Journal of Translational Engineering in Health and Medicine (http://health.embs.org/). There will be a comprehensive White Paper generated and published from the conference presentations and panel discussions. Conference themes to which papers can be submitted:

- Point-Of-Care (POC) Technologies
- Clinical Translational of Healthcare Innovations
- POC Technologies for Under Resourced Environment
- Lab on a Chip
- Devices for Molecular Epidemiology
- POC Technologies for Intensive-Care Applications
- Personalized, Preventive and Precision Medicine
- Global Healthcare Challenges

**Conference website for Paper Submission Instructions and deadlines**
**http://hipt.embs.org/2017/**
**Submission of 2-page Translation Showcase Proposal: August 15, 2017**
**Submission of 4-page Papers for Technical Sessions: September 1, 2017**
**Submission of 4-page papers for Student Paper Competition: September 1, 2017**
**Submission of 1-Page Technical Papers: September 15, 2017**
**Submission of Student Design Competition: August 15, 2017**

# IEEE Life Sciences Conference

**IEEE** | **IEEE lifesciences** | **EMB**

### *"Personalized Healthcare & Wearables"*

## Sydney, Australia 13-15 December, 2017

***The first IEEE Life Sciences Conference (LSC) will be held in Sydney, Australia, 13-15 December 2017.*** The overall theme of the conference is "Personalized Healthcare & Wearables". The IEEE Life Sciences Technical Community (LSTC), which is supported by multiple IEEE member societies, is the sponsor of the conference. As such, the conference will cover diverse topics within the theme.

LSC 2017 will include tutorials and a scientific program composed of plenary talks, invited sessions, and poster presentations of peer-reviewed papers. In addition, there will be a host of special events, including a Standards Track, an IEEE Women in Engineering event, a High School Competition, an e-textile style fashion show, and an IBM Big Data/Watson event in partnership with the IEEE Big Data Initiative. All are encouraged to submit papers containing original contributions to be considered for presentation at LSC 2017. Accepted 4-page regular papers will be published in the conference proceedings and included in IEEE Xplore. To communicate late scientific findings and to encourage attendance by a broader audience, LSC 2017 will provide additional presentation opportunities via a second track featuring posters. Topics include, but are not limited to:

- Smart devices and technologies
- Smart garments/textiles
- Wearable sensors
- Biosensor technologies
- Imaging technologies and processing
- Data preprocessing, cleansing, management, mining, and integration
- Biosignal processing
- Design methodologies and app development
- Biosensor-based mobile health apps
- Virtual reality (VR) in healthcare and medicine
- Brain-computer interfaces
- Point of Care devices and technologies

- Security and privacy
- Synthetic biology
- Medical control systems
- Big Data for healthcare
- Deep learning and pattern recognition
- Bioinformatics
- Rehabilitation and assistive technologies
- Biometrics
- IoT for healthcare
- Electronic medical records
- Energy harvesting/scavenging technology
- Wireless communication and networking
- Social implications of technology

| Schedule for 4-page Paper Submissions | Schedule for 2-page Paper Submissions |
| --- | --- |
| Submission Due Date: **September 12, 2017** | Submission Due Date: **September 12, 2017** |
| Decision Notification Date: **October 5, 2017** | Decision Notification Date: **October 5, 2017** |
| Final Paper Submission Date: **October 30, 2017** | Final Paper Submission Date: **October 30, 2017** |

### *Visit the conference website at lsc.ieee.org/2017*

# BSN & BHI 2018

**Body Sensor Networks (BSN) and the Biomedical and Health Informatics (BHI) Conferences**

# SAVE THE DATE

A New exciting congress has been created by co-locating the Body Sensor Networks (BSN) and the Biomedical and Health Informatics (BHI) Conferences into one location and date during the HIMSS Conference and Exhibition in Las Vegas this year.

Come and take advantage of attending these three powerhouse conferences all during your one stay in Las Vegas.

**4-7, March 2018**
*Treasure Island Hotel and Casino*
**Las Vegas, Nevada – USA**

# Call for Papers

*Papers can be submitted to the conference website based on the following schedule:*

**September 12, 2017** – Submission Deadline for Full Papers
**October 16, 2017** – Notification of Acceptance of Full Papers
**October 30, 2017** – Submission Deadline for Final Paper Upload

Please go to our website:
*http://bsn-bhi.embs.org/2018*
for updated information as we have it.

**IEEE**  **EMB**

Follow us on Twitter: *@IEEEembs* and Facebook: *facebook.com/IEEEembs*

# IEEE International Symposium on Biomedical Imaging

## April 4-7, 2018, Omni Shoreham Hotel, Washington, D.C.

Connect with us:

The **IEEE International Symposium on Biomedical Imaging (ISBI)** is a scientific conference dedicated to mathematical, algorithmic, and computational aspects of biological and biomedical imaging, across all scales of observation. It fosters knowledge transfer among different imaging communities and contributes to an integrative approach to biomedical imaging. ISBI is a joint initiative from the IEEE Signal Processing Society (SPS) and the IEEE Engineering in Medicine and Biology Society (EMBS). The 2018 meeting will include tutorials, and a scientific program composed of plenary talks, invited special sessions, challenges, as well as oral and poster presentations of peer-reviewed papers. High-quality papers are requested containing original contributions to the topics of interest including image formation and reconstruction, computational and statistical image processing and analysis, dynamic imaging, visualization, image quality assessment, and physical, biological, and statistical modeling. Accepted 4-page regular papers will be published in the symposium proceedings published by IEEE and included in IEEE Xplore. To encourage attendance by a broader audience of imaging scientists and offer additional presentation opportunities, ISBI 2018 will continue to have a second track featuring posters selected from 1-page abstract submissions without subsequent archival publication.

## Keynote Speakers

**Sam Achilefu**, Washington University in St. Louis, Optical Molecular Imaging

**Kim Butts Pauly**, Stanford University, MR guided Focused Ultrasound

**Peter Basser**, National Institutes of Health, MR Diffusion Tensor Imaging

**Anne Carpenter**, Broad Institute, Harvard/MIT, Cellular Image Analysis

**Laura Waller**, UC Berkeley, Microscopy and Computational Imaging

## Important Dates

### Proposal Submission

| | |
|---|---|
| Tutorials, Special Sessions, & Challenges | *May 29, 2017- September 25, 2017* |

### 4 page papers

| | |
|---|---|
| Submission Opens | *July 31, 2017* |
| Submission Deadline | *October 16, 2017* |
| Accept/Reject Notification | *December 18, 2017* |
| Final Submission | *January 8, 2018* |

### 1 page papers

| | |
|---|---|
| Submission Opens | *November 20, 2017* |
| Submission Deadline | *January 8, 2018* |
| Accept/Reject Notification | *January 22, 2018* |
| Final Submission Opens | *January 22, 2018* |
| Final Submission Deadline | *February 5, 2018* |

## Organizing Committee:

**Conference Chairs**
Amir Amini *(amir.amini@louisville.edu)*
Scott Acton *(acton@virginia.edu)*

**Program Chairs**
Erik Meijering *(meijering@imagescience.org)*
Ron Summers *(rms@nih.gov)*

**Plenary Chairs**
Julia Schnabel *(julia.schnabel@kcl.ac.uk)*
Michael Unser *(michael.unser@epfl.ch)*

**Tutorial Chairs**
Jerry Prince *(prince@jhu.edu)*
Tanveer Syeda-Mahmood *(stf@us.ibm.com)*

**Special Sessions**
Arrate Muñoz-Barrutia *(mamunozb@ing.uc3m.es)*
Erin Girard *(erin.girard@siemens.com)*

**Challenges**
Bram van Ginneken
*(bram.vanginneken@radboudumc.nl)*
Adrienne Mendrik *(a3nnem@gmail.com)*
Dan Weller *(dsw8c@virginia.edu)*

**Exhibits and Industry Liasons**
Marie-Pierre Jolly *(marie-pierre.jolly@siemens. com)*
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Eliot Siegel *(esiegel@umaryland.edu)*

**Student Awards**
Yuping Wang *(wyp@tulane.edu)*
Lei Ying *(leiying@buffalo.edu)*

**Local Arrangements**
Siddhartha Sikdar *(ssikdar@gmu.edu)*
Juan Cebral *(jcebral@gmu.edu)*
Murray Loew *(loew@gwu.edu)*

*http://biomedicalimaging.org/2018/*

**40th International Conference of the IEEE Engineering in Medicine and Biology Society**

**EMBC'18**
Honolulu, HI

**July 17-21 2018**

Honolulu, HI

◆IEEE

EMB

**Hawaii Convention Center**
**Hilton Hawaiian Village Waikiki Beach Resort**
*Honolulu, Hawaii, USA*
**July 17-21, 2018**

# CALL FOR PAPERS

## *Learning from the Past, Looking to the Future*

The IEEE Engineering in Medicine and Biology Society is pleased to announce the *40th International Engineering in Medicine and Biology Conference, to be held in Honolulu, Hawaii from July 17-21, 2018*. The theme of the meeting is "Learning from the Past, Looking to the Future", inspired by the 40th anniversary of the world's largest international biomedical engineering meeting. Consistent with our theme, we have arranged plenary keynotes from leading industrial and academic scientists, who will give forward looking visions as well as historical perspectives on our field. A broad array of scientific tracks will cover diverse topics of cutting-edge research and innovation in biomedical engineering, healthcare technology R&D, translational clinical research, technology transfer and entrepreneurship, and biomedical engineering education. In addition to the high-profile keynotes, the conference program will feature mini symposia, workshops, invited sessions, oral and poster sessions, sessions for students and young professions, sessions for clinicians and entrepreneurs, and exhibits from vendors and universities.

*Paper Submission Opens:* **1 August 2017**
*Contributed Paper Submission Deadline:* **10 January 2018**
*Final Paper Submission Deadline:* **7 April 2018**

*http://embc.embs.org/2018/*

# Aloha! Save the Date!

## IEEE EMBS Micro & Nanotechnology Conference in Medicine

◆IEEE

**10-14 December 2018**
**Grand Hyatt Kauai Resort & Spa**

EMB

## Translating Technology from the Bench to the Bedside

Biomedical grand challenges facing our society can be addressed at the scale of biology with Micro and Nanoscale technologies. These technologies hold great potential for diagnostics, therapeutics, enhancement of physiological function, disease management, or early monitoring and prevention. IEEE EMBS is sponsoring the fourth biennial Conference on Micro and Nanotechnology in Medicine to foster interaction between scientists, engineers, entrepreneurs and medical researchers in the context of real-world medical needs and issues. The Conference will promote vigorous and open dialogue towards groundbreaking solutions to previously unaddressed problems and innovative technologies for faster, more quantitative and less expensive biomedical solutions by using advances in Micro and Nanotechnology.

Join us in an intensive week of technology! Hear from key leaders and entrepreneurs in academia and industry and meet the researchers of tomorrow! Daily lectures and posters with networking activities!

**www.mnm.embs.org**

*cx*

# Future EMBC Locations

| | | |
|---|---|---|
| 2018 | 17-21 July | Honolulu, Hawaii |
| 2019 | 23-27 July | Berlin, Germany |
| 2020 | 20-25 July | Montreal, Canada |
| 2021 | July | TBD |
| 2022 | 11-15 July | Glasgow, Scotland |
| 2023 | 25-29 July | Sydney, Australia |

# Program in Chronological Order

## Wednesday, 12 July 2017

**WeAT1:**  08:00-09:30 — Roentgen Hall
**Recent Progress in Biosignal-Based Human-Computer Interaction** (Minisymposium)
**Chair:**  Im, Chang-Hwan *(Hanyang University)*
**Co-Chair:**  Hwang, Han-Jeong *(Kumoh National Institute of Tech3)*

08:00-08:15 — WeAT1.1
**Face-Machine Interface (FMI) for Communication of Patients with Amyotrophic Lateral Sclerosis (ALS)**
Im, Chang-Hwan\* *(Hanyang University)*

08:15-08:30 — WeAT1.2
**Recognition of Human Emotional Experiences using Inter-Subject Neural Correlations**
Hu, Xin *(Dept. of Psychology, Tsinghua University)*; Zhang, Dan\* *(Tsinghua University)*

08:30-08:45 — WeAT1.3
**EMG-Based Prosthesis Control for Upper Limb Amputation**
Hwang, Han-Jeong\* *(Kumoh National Institute of Technology)*

08:45-09:00 — WeAT1.4
**Towards Brain-Computer Interfaces Outside the Lab: New Measuring Devices and Machine Learning Challenges**
Brandl, Stephanie\* *(Berlin Institute of Tech.)*; von Lühmann, Alexander *(Machine Learning Dept. and Neurotechnology, Technische Univ)*; Müller, Klaus-Robert *(Berlin Institute of Tech.)*

**WeAT2:**  08:00-09:30 — Cho Room
**Recent Advances on Image-Guided Devices and Therapies** (Minisymposium)
**Chair:**  Xu, Lisa Xuemin *(Shanghai Jiaotong University)*
**Co-Chair:**  Fowlkes, Brian *(University of Michigan)*

08:00-08:15 — WeAT2.1
**Minimal Invasive Multi-Mode Therapy of Metastatic Cancer**
Xu, Lisa Xuemin\* *(Shanghai Jiaotong University)*

08:15-08:30 — WeAT2.2
**Efficient Energy Delivery for Image-Guided HIFU with Phased Arrays**
Li, Ke *(Shanghai Jiao Tong University)*; Ji, Xiang *(Shanghai Jiao Tong University)*; Bai, Jingfeng\* *(Shanghai Jiao Tong University)*; Chen, Yazhu *(Shanghai Jiaotong University)*

08:30-08:45 — WeAT2.3
**"Seeing" HIFU Lesions with Ultrasound**
Cleveland, Robin\* *(University of Oxford)*; Adams, Matthew T *(Bose Consumer Electronics)*; Raymond, Jason L *(University of Oxford)*; Roy, Ronald A *(University of Oxford)*

**WeAT3:**  08:00-09:30 — Park Room
**Next Generation Intravascular Imaging – I** (Minisymposium)
**Chair:**  Yoo, Hongki *(Hanyang University)*

08:00-08:15 — WeAT3.1
**Intravascular Photoacoustic/Ultrasound Catheter**
Kim, Chulhong\* *(Pohang University of Science and Technology)*

08:30-08:45 — WeAT3.3
**Recent Advances in Intravascular OCT Technology**
Lim, Jaeyeong *(Sejong University)*; Song, Choong Seok *(Sejong University)*; Lee, Seungwan *(Sejong University)*; Ha, Jinyong\* *(Sejong University)*

09:00-09:15 — WeAT3.5
**Quantitative Intravascular Fluorescence-Ultrasound Imaging in Vivo**
Ntziachristos, Vasilis\* *(Technische Universität München & Helmholtz Zentrum München)*

**WeAT4:**  08:00-09:30 — Min Room
**Novel Sensing Methods I** (Oral Session)
**Chair:**  Chon, Ki *(University of Connecticut)*
**Co-Chair:**  Posada-Quintero, Hugo Fernando *(Univ. of Connecticut)*

08:00-08:15 — WeAT4.1
**Wearable Health Monitoring using Capacitive Voltage-Mode Human Body Communication**
Maity, Shovan\* *(Purdue University)*; Das, Debayan *(Purdue University)*; Sen, Shreyas *(Purdue University)*

08:15-08:30 — WeAT4.2
**A Self-Powered Glucose Biosensor based on Pyrolloquinoline Quinone Glucose Dehydrogenase and Bilirubin Oxidase Operating under Physiological Conditions**
Kulkarni, Tanmay *(University of Maryland Baltimore County)*; Slaughter, Gymama\* *(University of Maryland Baltimore County)*

08:30-08:45 — WeAT4.3
**Detection of Needle to Nerve Contact based on Electric Bioimpedance and Machine Learning Methods**
Kalvøy, Håvard\* *(Rikshospitalet, Oslo University Hospital, Oslo, Norway)*; Tronstad, Christian *(Oslo University Hospital)*; Ullensvang, Kyrre *(Division of Emergencies and Critical Care, Dept. of Anaesth)*; Steinfeldt, Torsten *(Philipps University of Marburg, Marburg an der Lahn, Hesse, Germ)*; Sauter, Axel R. *(Dept. of Research and Development, Division of Emergencies)*

08:45-09:00 — WeAT4.4
**Testing the Need for Carbon in Salt/Adhesive Electrodes for Surface Electromyography Measurements: Preliminary Results**
Posada-Quintero, Hugo Fernando\* *(University of Connecticut)*; Rood, Ryan *(University of Connecticut)*; Ye, Xiang *(University of Connecticut)*; Pias, Matthew *(University of Connecticut)*; Burnham, Ken *(FLEXcon Company, Inc.)*; Pennace, John *(FLEXcon Company, Inc.)*; Chon, Ki *(University of Connecticut)*

09:00-09:15 — WeAT4.5
**A Rapid Quantitative Determination Method of Luteinizing Hormone with Gold Immunochromatographic Strip**
Liu, Juntao *(Institute of Electronics, Chinese Academy of Sciences)*; Kong, Zhuang *(tate Key Laboratory of Transducer Technology, Institute of Elect)*; Wang, Yang *(Fan Yan The State Key Laboratory of Transducer Technolog)*; Fan, Yan *(The State Key Laboratory of Transducer Technology, Institute of)*; luo, Jinping *(Institute of Electronics, Chinese Academy of Sciences)*; Xu, Shengwei *(Institute of Electronics, Chinese Academy of Science)*; Jin, Hongyan *(Obstetrics and Gynecology Dept., First Hospital Peking Univ)*; Cai, Xinxia\* *(Institute of Electronics, Chinese Academy of Sciences)*

09:15-09:30 — WeAT4.6
**Integration of Piezo-Capacitive and Piezo-Electric Nanoweb based Pressure Sensors for Imaging of Static and Dynamic Pressure Distribution**
Jeong, You Jeong *(Kyung Hee University)*; Oh, Tong In\* *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*; Kim, Kap Jin *(Kyung Hee University)*

**WeAT7:** 08:00-09:30      Herrick Room
**Novel Approaches to BME Education** (Oral Session)
**Chair:** Kant Kumar, Dinesh *(RMIT University)*
**Co-Chair:** Esterer, Benjamin *(Univ. of Applied Sciences Upper Austria)*

08:00-08:15      WeAT7.1
**Problem based Learning for Engineering**
Radcliffe, Pj* *(RMIT Univ.)*; Kant Kumar, Dinesh *(RMIT Univ.)*

08:15-08:30      WeAT7.2
**A Course in Prosthetics for the Developing World:**
**Merging Education, Research, and Industry to**
**Teach Biomedical Design for Social Impact**
Ranger, Bryan* *(Massachusetts Institute of Technology)*;
Mantzavinou, Aikaterini *(Massachusetts Institute of Technology)*

08:30-08:45      WeAT7.3
**The Role of a Creative Joint Assignment" Project in**
**Biomedical Engineering Bachelor Degree Education**
Jiang, Jiehui* *(Shanghai University)*; Zhang, Yuting *(Shanghai University)*; Zhou, Mi *(Shanghai University)*; Zheng, Xiaosong *(Shanghai University)*; Yan, Zhuangzhi *(Shanghai University)*

08:45-09:00      WeAT7.4
**Design and Development of an Intelligent Nursing Bed**
**a Pilot Project of "Joint Assignment"**
Jiang, Jiehui* *(Shanghai University)*; Liu, TingWei *(Shanghai University)*; Zhang, Yuting *(Shanghai University)*; Song, Wolf *(Delft University of Technology)*; Zhou, Mi *(Shanghai University)*; Zheng, Xiaosong *(Shanghai University)*; Yan, Zhuangzhi *(Shanghai University)*

09:00-09:15      WeAT7.5
**A Hybrid, Low-Cost Tissue-Like Epidural**
**Needle Insertion Simulator**
Esterer, Benjamin* *(Univ. of Applied Sciences Upper Austria)*; Gabauer, Stefan *(Research Group for Surgical Simulators Linz, Upper Austria Univ.)*; Pichler, Robert *(Johannes Kepler Univ. Linz)*; Wirthl, Daniela *(Johannes Kepler Univ. Linz)*; Drack, Michael *(Johannes Kepler Univ. Linz)*; Hollensteiner, Marianne *(Upper Austria Univ. of Applied Sciences)*; Kettlgruber, Gerald *(Johannes Kepler Univ. Linz)*; Kaltenbrunner, Martin *(Johannes Kepler Univ. Linz)*; Bauer, Siegfried *(Johannes Kepler Univ.)*; Fuerst, David *(Upper Austria Univ. of Applied Sciences)*; Merwa, Robert *(Univ. of Applied Sciences Upper Austria)*; Meier, Jens *(Kepler Univ. Linz)*; Augat, Peter *(Institute for Biomechanics, BGU Murnau)*; Schrempf, Andreas *(Upper Austria Univ. of Applied Sciences)*

09:15-09:30      WeAT7.6
**Novel Synthetic Vertebrae Provide Realistic Haptics for**
**Pedicle Screw Placement**
Hollensteiner, Marianne* *(Upper Austria Univ. of Applied Sciences)*; Augat, Peter *(Institute for Biomechanics, BGU Murnau)*; Fuerst, David *(Upper Austria Univ. of Applied Sciences)*; Esterer, Benjamin *(Univ. of Applied Sciences Upper Austria)*; Gabauer, Stefan *(Research Group for Surgical Simulators Linz, Upper Austria Univ.)*; Püschel, Klaus *(Univ. of Hamburg)*; Schroedl, Falk *(Paracelsus Medical Univ.)*; Schrempf, Andreas *(Upper Austria Univ. of Applied Sciences)*

**WeAT8:** 08:00-09:30      Schwan Room
**Neuromuscular Systems I** (Oral Session)

08:00-08:15      WeAT8.1
**Characterizing Dynamic Balance during**
**Adaptive Locomotor Learning**
Park, Sungwoo* *(University of Southern California)*; Finley, James *(University of Southern California)*

08:15-08:30      WeAT8.2
**Early Prediction of Future Hand Movements using sEMG Data**
Koch, Philipp* *(Univ. of Luebeck)*; Phan, Huy *(Univ. of Lübeck)*; Maaß, Marco *(Univ. of Lübeck)*; Katzberg, Fabrice *(Univ. of Luebeck)*; Mertins, Alfred *(Univ. of Lübeck)*

08:30-08:45      WeAT8.3
**Muscle Contractions in Cyclic Movements:**
**Optimization of CIMAP Algorithm**
Rosati, Samanta *(Politecnico di Torino)*; Castagneri, Cristina *(Politecnico di Torino)*; Agostini, Valentina* *(Politecnico di Torino)*; Knaflitz, Marco *(Politecnico di Torino)*; Balestra, Gabriella *(Politecnico di Torino)*

08:45-09:00      WeAT8.4
**Simple Space-Domain Features for Low-Resolution**
**EMG Pattern Recognition**
Donovan, Ian *(San Francisco State Univ.)*; Puchin, Juris *(San Francisco State Univ.)*; Okada, Kazunori *(San Francisco State Univ.)*; Zhang, Xiaorong* *(San Francisco State Univ.)*

09:00-09:15      WeAT8.5
**Movement Augmentation to Evaluate Human Control of**
**Locomotor Stability**
Brown, Geoffrey *(Northwestern University)*; Wu, Mengnan/Mary *(Northwestern University)*; Huang, Felix *(Rehabilitation Institute of Chicago)*; Gordon, Keith* *(Feinberg School of Medicine, Northwestern University)*

09:15-09:30      WeAT8.6
**Ankle Intrinsic Stiffness is Modulated by Postural Sway**
Amiri, Pouya* *(PhD Candidate, The Dept. of Biomedical Engineering, McGill)*; Kearney, Robert Edward *(McGill Univ.)*

**WeAT9:** 08:00-09:30      Plonsey Room
**Recent Advances in Neural Stimulation for**
**Cortical Neural Interfaces** (Minisymposium)
**Chair:** Fried, Shelley *(Massachusetts General Hospital / Harvard Medical School)*

08:00-08:15      WeAT9.1
**Development of Implantable Microcoils for**
**Precise Activation of Cortex**
Lee, Seung Woo* *(Massachusetts General Hospital and Harvard Medical School)*; Fried, Shelley *(Massachusetts General Hospital / Harvard Medical School)*

08:15-08:30      WeAT9.2
**The Gennaris Cortical Bionic Vision Implant:**
**Progress towards a First-in-Human Trial**
Rosenfeld, Jeffrey V.* *(Monash University)*; Lowery, Arthur James *(Monash University)*; Mohan, Anand *(Monash University)*; Li, Wai-ho *(Apple)*; Brunton, Emma Kate *(Newcastle University)*; Yan, Edwin *(Monash University)*; Serracino-Inglott, Ferdinand *(Manchester Royal Infirmary)*; Rosa, Marcello *(Monash University)*; Pritchard, Jeanette *(Monash Vision Group)*

08:30-08:45      WeAT9.3
**Long Term Stimulation of Human Somatosensory Cortex**
Gaunt, Robert* *(University of Pittsburgh)*; Flesher, Sharlene N *(University of Pittsburgh)*; Weiss, Jeffrey *(University of Pittsburgh)*; Collinger, Jennifer *(University of Pittsburgh)*; Boninger, Michael *(University of Pittsburgh)*

**WeAT10:** 08:00-09:30      Schmitt Room
**Models for Clinical Decision Support** (Oral Session)
**Chair:** Dokos, Socrates *(University of New South Wales)*

08:00-08:15      WeAT10.1
**Predicting the Outcome for Patients in a Heart**
**Transplantation Queue using Deep Learning**
Medved, Dennis* *(Lund University)*; Nilsson, Johan *(Dept. Clinical Sciences Lund, CardioThoracic Surgery, Lund Univ.)*; Nugues, Pierre *(Lund University)*

08:15-08:30      WeAT10.2
**Staged Inference using Conditional Deep Learning for**
**Energy Efficient Real-Time Smart Diagnosis**
Parsa, Maryam *(Purdue University)*; Panda, Priyadarshini *(Purdue University)*; Sen, Shreyas *(Purdue University)*; Roy, Kaushik* *(Purdue University)*

**08:30-08:45**  WeAT10.3
**Classifying Osteosarcoma Patients using Machine Learning Approaches**
Li, Zhi* *(University of Michigan)*; Soroushmehr, S.M.Reza *(University of Michigan, Ann Arbor)*; Hua, Yingqi *(Shanghai Bone Tumor Institute, Shanghai General Hospital, Shangh)*; Mao, Min *(Shanghai Bone Tumor Institute, Shanghai General Hospital, Shangh)*; Qiu, Yunping *(Albert Einstein College of Medicine)*; Najarian, Kayvan *(University of Michigan - Ann Arbor)*

**08:45-09:00**  WeAT10.4
**Development of a Three Dimensional, Multiscale Agent-Based Model of Ductal Carcinoma in Situ**
Butner, Joseph *(University of New Mexico)*; Cristini, Vittorio *(University of New Mexico)*; Wang, Zhihui* *(University of Texas Health Science Center at Houston McGovern Me)*

**09:00-09:15**  WeAT10.5
**Elucidating the Biophysical Processes Responsible for the Chromatic Attributes of Peripheral Cyanosis**
Baranoski, Gladimir Valerio Guimaraes* *(University of Waterloo)*; Van Leeuwen, Spencer Richard *(University of Waterloo)*; Chen, Tenn Francis *(University of Waterloo)*

**09:15-09:30**  WeAT10.6
**SMARTool: A Tool for Clinical Decision Support for the Management of Patients with Coronary Artery Disease based on Modeling of Atherosclerotic Plaque Process**
Sakellarios, Antonis *(Unit of Medical Technology and Application Systems, Dept of Mate)*; Rigas, Georgios *(Univ. of Ioannina)*; Kigka, Vassiliki *(Univ. of Ioannina)*; Siogkas, Panagiotis *(FORTH-IMBB)*; Tsompou, Panagiota *(Unit of Medical Technology and Intelligent Information Systems,)*; Karanasiou, Georgia *(Univ. of Ioannina, Dept. of Materials Science, Unit of)*; Exarchos, Themis P. *(Unit of Medical Tech & Intelligent Info)*; Andrikos, Ioannis *(Univ. of Ioannina)*; Tachos, Nikolaos *(Unit of Medical Technology and Intelligent Information Systems,)*; Pelosi, Gualtiero *(Institute of Clinical Physiology, National Research Council, 561)*; Parodi, Oberdan *(CNR Clinical Physiology Institute - Milan)*; Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

**WeAT11:  08:00-09:30**  Greatbatch Room
**PPG Signal Analysis** (Oral Session)
**Chair:**  de Chazal, Philip *(University of Sydney)*

**08:00-08:15**  WeAT11.1
**Coronary Artery Disease Detection using Photoplethysmography**
Paradkar, Neeraj* *(International Institute of Information Technology)*; Roy Chowdhury, Shubhajit *(Indian Institute of Technology Mandi)*

**08:15-08:30**  WeAT11.2
**Computationally Efficient Algorithm for Photoplethysmography-Based Atrial Fibrillation Detection using Smartphones**
Schäck, Tim* *(Technische Universität Darmstadt)*; Safi Harb, Yosef *(Happitech)*; Muma, Michael *(Technische Universität Darmstadt)*; de Jong, Jonas S. S. G. *(OLVG Hospital)*; Zoubir, Abdelhak M. *(Signal Processing Group, Institute of Telecommunications, Techni)*

**08:30-08:45**  WeAT11.3
**A Novel Method for Accurate Estimation of HRV from Smartwatch PPG Signals**
Bhowmik, Tanmoy* *(Samsung Research Institute)*; Dey, Jishnu *(Samsung R&D Institute India, Bangalore)*; Tiwari, Vijay Narayan *(Samsung Research India, Banglore)*

**08:45-09:00**  WeAT11.4
**Cardiac Arrhythmia Detection using Photoplethysmography**
Paradkar, Neeraj* *(International Institute of Information Technology)*; Roy Chowdhury, Shubhajit *(Indian Institute of Technology Mandi)*

**09:00-09:15**  WeAT11.5
**Photoplethysmography Beat Detection and Pulse Morphology Quality Assessment for Signal Reliability Estimation**
Papini, Gabriele* *(Eindhoven University of Technology)*; Fonseca, Pedro *(Philips Research and Eindhoven University of Technology)*; Aubert, Xavier *(Philips Research Laboratories Europe)*; Overeem, Sebastiaan *(Kempenhaeghe Foundation, Sleep Medicine Centre)*; Bergmans, Johannes Wilhelmus Maria *(Eindhoven University of Technology)*; Vullings, Rik *(Eindhoven University of Technology)*

**09:15-09:30**  WeAT11.6
**Enhanced Detection of Sleep Apnoea using Heart-Rate, Respiration Effort and Oxygen Saturation Derived from a Photoplethysmography Sensor**
Jayawardhana, Madhuka* *(University of Sydney)*; de Chazal, Philip *(University of Sydney)*

**WeAT12:  08:00-09:30**  Geddes Room
**Clinical Applications of Mobility Assessment** (Oral Session)
**Chair:**  Tamura, Toshiyo *(Waseda University)*

**08:00-08:15**  WeAT12.1
**An Elderly Fall Detection using a Wrist-Worn Accelerometer and Barometer**
Jatesiktat, Prayook* *(NTU)*; Ang, Wei Tech *(Nanyang Technological University)*

**08:15-08:30**  WeAT12.2
**Using Measurements from Wearable Sensors for Automatic Scoring of Parkinson's Disease Motor States: Results from 7 Patients**
Thomas, Ilias *(Dalarna University)*; Bergquist, Filip *(Gothenburg University)*; Constantinescu, Radu *(Gothenburg University)*; Nyholm, Dag *(Uppsala University)*; Senek, Marina *(Uppsala University)*; Memedi, Mevludin* *(Dalarna University)*

**08:30-08:45**  WeAT12.3
**Artifact Detection in Accelerometer Signals Acquired from the Carotid**
Muehlsteff, Jens *(Philips)*; Santos de Oliveira e Silva, Bernardo Jose' *(University of Coimbra)*; Couceiro, Ricardo* *(University of Coimbra)*; Henriques, Jorge *(University of Coimbra)*; de Carvalho, Paulo *(University of Coimbra)*

**08:45-09:00**  WeAT12.4
**Development of a Wearable Plantar Force Measurement Device for Gait Analysis in Remote Conditions**
Hamid, Rawnak *(Biomedical Integrated Circuits and Sensors Laboratory, Electric)*; Yuce, Mehmet* *(Monash University)*; Redouté, Jean-Michel *(Monash University)*; McMillan, Lachlan *(Dept. of Medicine, School of Clinical Sciences at Monash He)*; Scott, David *(Dept. of Medicine, School of Clinical Sciences at Monash He)*; Wijesundara, Suharshani *(Dept. of Electrical and Computer Systems Engineering, Monash)*; Ebeling, Peter R *(Dept. of Medicine, School of Clinical Sciences at Monash He)*

**09:00-09:15**  WeAT12.5
**Weakly-Supervised Learning for Parkinson's Disease Tremor Detection**
Zhang, Ada* *(Carnegie Mellon University)*; Cebulla, Alexander *(ETH Zurich)*; Panev, Stanislav *(Carnegie Mellon University)*; Hodgins, Jessica *(Carnegie Mellon University)*; Torre, Fernando de la *(Carnegie Mellon University)*

**09:15-09:30**  WeAT12.6
**Real-Time Gait Analysis with Accelerometer-Based Smart Shoes**
Delgado-Gonzalo, Ricard* *(CSEM)*; Hubbard, Jeremy *(ICON Health & Fitness)*; Renevey, Philippe *(CSEM)*; Lemkaddem, Alia *(CSEM)*; Vellinga, Quinn *(iFit)*; Ashby, Darren *(ICON Health & Fitness Inc.)*; Jared, Willardson *(ICON Health & Fitness Inc.)*; Bertschi, Mattia *(CSEM)*

**WeAT13:** 08:00-09:30          Dunn Room
**Pharmaceutical Engineering for Smart Drug Delivery Systems** (Invited Session)
**Chair:** Cai, Lintao *(Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)*
**Co-Chair:** Gong, Shaoqin *(University of Wisconsin-Madison)*

08:00-08:15          WeAT13.1
**Liquid-Metal Nanomedicine for Combination Anticancer Therapy**
Lu, Yue *(UNC at Chapel Hill / NC State)*; Quanyin, Hu *(UNC at Chapel Hill / NC State)*; Gu, Zhen* *(UNC at Chapel Hill / NC State)*

08:15-08:30          WeAT13.2
**Cancer Cell Membrane-Functionalized Oxygen-Nanocarrier for Breaking Hypoxia-Induced Chemoresistance**
Cai, Lintao* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Zheng, Mingbin *(Shenzhen Institutes of Advanced Technology)*; Tian, Hao *(Shenzhen Institutes of Advanced Technology)*

08:30-08:45          WeAT13.3
**Multifunctional Unimolecular Micelles for Targeted Triple Negative Breast Cancer Therapy**
Gong, Shaoqin* *(University of Wisconsin-Madison)*; Wang, Yuyuan *(University of Wisconsin-Madison)*; Chen, Guojun *(University of Wisconsin-Madison)*; Zhou, Zhiyang *(Emory University)*; Yang, Lily *(Emory University)*

**WeAT14:** 08:00-09:30          Schaldach Room
**Emerging Methods in Medical Image Analysis** (Minisymposium)
**Chair:** Fujita, Hiroshi *(Gifu University)*
**Co-Chair:** Lee, Gobert *(Flinders University)*

08:00-08:15          WeAT14.1
**Computer-Aided Analysis of Diffuse Lung Diseases on Chest Radiographs: Feature Extraction based Method versus Non-Feature Extraction based Method**
Kido, Shoji* *(Graduate School of Science and Technology for Innovation, Yamagu)*; Hashimoto, Noriaki *(Yamaguchi University)*; Hirano, Yasushi *(Yamaguchi University)*

08:15-08:30          WeAT14.2
**Deep Convolutional Neural Network for Forensic Odontology**
Muramatsu, Chisako* *(Gifu University)*; Miki, Yuma *(Gifu University)*; Yanashita, Yudai *(Gifu University)*; Hayashi, Tatsuro *(Media)*; Hara, Takeshi *(Gifu Univ Graduate Sch of Medicine)*; Katsumata, Akitoshi *(Asahi University)*; Fujita, Hiroshi *(Gifu University)*

08:30-08:45          WeAT14.3
**Characterizing Complex Shape in Biomedical Images**
Bottema, Murk Jan* *(Flinders University)*; Gontar, Amelia *(Flinders University)*

08:45-09:00          WeAT14.4
**Statistical Region Merging and Segmentation in Abdominal CT**
Lee, Gobert* *(Flinders University)*

**WeAT15:** 08:00-09:30          Webster Room
**Modeling and Estimation of the Respiratory System for Clinical Applications** (Invited Session)
**Chair:** Chbat, Nicolas W. *(Center of Excellence in Critical Care Innovation)*
**Co-Chair:** Heldt, Thomas *(Massachusetts Institute of Technology)*

08:00-08:15          WeAT15.1
**Modeling of Cardiac Oscillations and Gaseous Mixing in Deadspace during Apnea**
Laviola, Marianna* *(University of Nottingham)*; Das, Anup *(University of Warwick)*; Chikhani, Marc *(University of Nottingham)*; Bates, Declan Gerard *(University of Warwick)*; Hardman, Jonathan G. *(University of Nottingham)*

08:15-08:30          WeAT15.2
**End-Inspiratory Occlusion in the Presence of Intrinsic PEEP**
Albanese, Antonio* *(Philips Research North America)*; Vicario, Francesco *(Philips Research North America)*; Buizza, Roberto *(Philips Research North America)*

08:30-08:45          WeAT15.3
**Two-Parameter Leak Estimation in Non-Invasive Ventilation**
Vicario, Francesco* *(Philips Research North America)*; Alkhairy, Samiya *(MIT)*; Buizza, Roberto *(Philips Research North America)*; Truschel, William *(Philips Respironics)*

08:45-09:00          WeAT15.4
**Modeling Pediatric ARDS Patients**
Saffaran, Sina *(The University of Warwick)*; Das, Anup *(University of Warwick)*; Hardman, Jonathan G. *(University of Nottingham)*; Yehya, Nadir *(Children's Hospital of Philadelphia)*; Bates, Declan Gerard* *(University of Warwick)*

09:00-09:15          WeAT15.5
**Mathematical Modeling of Respiratory Drive in Patients on Pressure Support Ventilation**
Thomsen, Lars Pilegaard* *(Aalborg Univ.)*; Karbing, Dan Stieper *(Aalborg Univ.)*; Rees, Stephen Edward *(Aalborg Univ.)*

09:15-09:30          WeAT15.6
**Clinical Applications of Respiratory Modeling via Quantitative Capnography**
Heldt, Thomas* *(Massachusetts Institute of Technology)*; Mieloszyk, Rebecca *(Philips Healthcare, University of Washington)*; Abid, Abubakar *(Massachusetts Institute of Technology)*; Verghese, George *(Massachusetts Institute of Technology)*; Krauss, Baruch *(Harvard Medical School)*

**WeAT16:** 08:00-09:30          Rushmer Room
**Bioimpedance in Biomedical Applications and Research: Concepts** (Minisymposium)
**Chair:** Bertemes-filho, Pedro *(The State Univ. of Santa Catarina)*

08:00-08:15          WeAT16.1
**Numerical Simulations of Bioimpedance Phenomena**
Krizaj, Dejan* *(Univ. of Ljubljana, Faculty of Electrical Engineering)*

08:15-08:30          WeAT16.2
**The Information within and the Interpretation of the Bioimpedance Measurement**
Tronstad, Christian* *(Oslo University Hospital)*; Kalvoy, Haavard *(Rikshospitalet)*; Martinsen, Ørjan G *(University of Oslo)*

08:45-09:00          WeAT16.4
**Electrical Properties of Phantoms for Mimicking Breast Tissue**
Grando Sirtoli, Vinicius *(Univ. do Estado de Santa Catarina)*; Morcelles, Kaue Felipe *(Univ. do Estado de Santa Catarina)*; Bertemes-filho, Pedro* *(The State Univ. of Santa Catarina)*

09:00-09:15          WeAT16.5
**Designing Electrical Bioimpedance Circuits for Clinical Instrument**
Bertemes-filho, Pedro* *(The State University of Santa Catarina)*

**WeBT1:** 14:20-15:50          Roentgen Hall
**Brain Signal Processing for Brain-Computer Interfaces (BCIs)** (Minisymposium)
**Chair:** Kim, Sung-Phil *(Ulsan National Institute of Science and Tech.)*

14:20-14:35          WeBT1.1
**Signal Characterization for a Musical Rhythm BCI**
Herff, Steffen *(Western Sydney Univ.)*; Johnson, Garett *(Old Dominion Univ.)*; Milne, Andrew *(Western Sydney Univ.)*; Herff, Christian *(Univ. of Bremen)*; Kim, Jinsoo *(UNIST)*; Shih, Jerry *(Mayo Clinic)*; Krusienski, Dean* *(Old Dominion Univ.)*

14:35-14:50          WeBT1.2
**The Network Properties of Motor Cortical Neural Activities**
Sohn, Jeong-woo* *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Kang, Bong-Keun *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Choi, Jong-ryul *(Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF))*

**14:50-15:05**  WeBT1.3
**Decoding Analysis of Spatio-Temporal Ensemble Activity in Anterior Lateral Motor Cortical Neurons**
Chae, Soyoung* *(Ulsan National Institute of Science and Technology (UNIST))*; Kim, Sung-Phil *(Ulsan National Institute of Science and Technology)*

**15:05-15:20**  WeBT1.4
**Modelling Abrupt Alteration in Neuron Tuning Preference from Point Process Observation**
Chen, Junjun *(Zhejiang Univ.)*; Xu, Kai *(Zhejiang Univ.)*; Wang, Yiwen* *(Hong Kong Univ. of Science and Technology)*

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**WeBT2:**  14:20-15:50  Cho Room
**Frontiers in Perinatal and Pediatric Imaging** (Invited Session)
**Chair:** Linguraru, Marius George *(Children's Natl. Health System)*

**14:50-15:05**  WeBT2.3
**Applying Sparse Coding on Putamen of Discriminating Premature Newborns**
Zhang, Jie* *(Arizona State Univ.)*; Wang, Yalin *(Arizona State Univ.)*; Shi, Jie *(School of Computing, Informatics, and Decision Systems Engineeri)*; Ceschin, Rafeal *(Univ. of Pittsburgh Medical Center)*; Nelson, Marvin *(Univ. of Southern California and Keck School of Medicine, c)*; Panigraphy, Ashok *(Children's Hospital Los Angeles)*; Lepore, Natasha *(Univ. of Southern California / Children's Hospital Los Ange)*

**15:20-15:35**  WeBT2.5
**Does Speech Rely on Right Anterior Putamen?**
Vlasova, Roza* *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Wang, Yalin *(Arizona State University)*; Dicks, Adrienne *(Geneva Foundation)*; Dean, Douglas *(University of Wisconsin-Madison)*; O'Muircheartaigh, Jonathan *(Brown University)*; Gonzalez, Sara *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Nguyen, Binh Kien *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Nelson, Marvin *(University of Southern California and Keck School of Medicine)*; Deoni, Sean *(University of Colorado)*; Lepore, Natasha *(University of Southern California / Children's Hospital Los Angeles)*

**15:35-15:50**  WeBT2.6
**Central Sulcus Development in Early Childhood**
Gajawelli, Niharika* *(USC)*; Deoni, Sean *(Univ. of Colorado)*; Dirks, Holly *(Brown Univ.)*; Dean, Douglas *(Univ. of Wisconsin-Madison)*; O'Muircheartaigh, Jonathan *(Brown Univ.)*; Wang, Yalin *(Arizona State Univ.)*; Nelson, Marvin *(Univ. of Southern California and Keck School of Medicine, c)*; Coulon, Olivier *(Aix-Marseille Univ.)*; Lepore, Natasha *(Univ. of Southern California / Children's Hospital Los Ange)*

**15:35-15:50**  WeBT2.7
**Design of Patient-Specific Concentric Tube Robots using Path Planning from 3D Ultrasound**
Morimoto, Tania* *(Stanford University)*; Cerrolaza, Juan J. *(Imperial College London)*; Hsieh, Michael *(Stanford University)*; Cleary, Kevin *(Children's National Medical Center)*; Okamura, Allison *(Stanford University)*; Linguraru, Marius George *(Children's National Health System)*

**15:35-15:50**  WeBT2.8
**Cranial Ultrasound-Based Prediction of Post Hemorrhagic Hydrocephalus Outcome in Premature Neonates with Intraventricular Hemorrhage**
Roshanitabrizi, Pooneh* *(Children's Natl. Health System)*; Obeid, Rawad *(Children's Natl. Health System)*; Mansoor, Awais *(Children's Natl. Health System)*; Ensel, Scott *(Children's Natl. Medical Center)*; Cerrolaza, Juan J. *(Imperial College London)*; Penn, Anna *(Children's Natl. Medical Center)*; Linguraru, Marius George *(Children's Natl. Health System)*

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**WeBT3:**  14:20-15:50  Park Room
**Next Generation Intravascular Imaging – II** (Minisymposium)
**Chair:** Yoo, Hongki *(Hanyang University)*

**14:20-14:35**  WeBT3.1
**Guiding Coronary Interventions with Light and Sound**
van Soest, Gijs* *(Erasmus MC)*

**14:50-15:05**  WeBT3.3
**Dual-Modality Fluorescence Lifetime and Intravascular Ultrasound for Intravascular Coronary Imaging**
Marcu, Laura* *(University of California Davis)*

**15:20-15:35**  WeBT3.5
**Looking into Coronary Plaque Biology: Intravascular Multimodal Optical Molecular Imaging Strategy**
Kim, Jin Won* *(Korea University Guro Hospital)*

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**WeBT4:**  14:20-15:50  Min Room
**Novel Sensing Methods II** (Oral Session)
**Chair:** Dong, Tao *(University College of Southeast Norway)*

**14:20-14:35**  WeBT4.1
**A Low Power Flash-FPGA based Brain Implant Micro-System of PID Control**
Xia, Lijuan* *(Electrical Engineering College)*; Fattah, Nabeel *(Newcastle University)*; Soltan, Ahmed *(Newcastle University, School of Electrical, Electronic and Compu)*; Jackson, Andrew *(Newcastle University)*; Chester, Eric Graeme *(Newcastle University)*; Degenaar, Patrick *(Newcastle University)*

**14:35-14:50**  WeBT4.2
**Smart Mat System with Pressure Sensor Array for Unobtrusive Sleep Monitoring**
Li, Wei* *(Fudan University)*; Sun, Chenglu *(Fudan University)*; Yuan, Wei *(Printable Electronics Research Centre, Suzhou Institute of Nanot)*; Gu, Weibing *(Printable Electronics Research Centre, Suzhou Institute of Nanot)*; Cui, Zheng *(Printable Electronics Research Centre, Suzhou Institute of Nanot)*; Chen, Wei *(Fudan University)*

**14:50-15:05**  WeBT4.3
**Design of a Microfluidic Paper-Based Device for Analysis of Biomarkers from Urine Samples on Diapers**
Couto, Adriana *(University of Minho)*; Dong, Tao* *(University College of Southeast Norway)*

**15:05-15:20**  WeBT4.4
**Stability of Colorimetric Results in the Detection of Urine Biomarkers using a Paper-Based Analytical Device**
Bertão, Ana *(Høgskolen i Sørøst-Norge avd Vestfold)*; Dong, Tao* *(University College of Southeast Norway)*

**15:20-15:35**  WeBT4.5
**Injection Moulded Microneedle Sensor for Real-Time Wireless pH Monitoring**
Mirza, Khalid* *(Imperial College London)*; Zuliani, Claudio *(Imperial College London)*; Hou, Benjamin *(Imperial College London)*; Ng, Fu Siong *(Imperial College London)*; Peters, Nicholas *(Imperial College London)*; Toumazou, Christofer *(Imperial College London)*

**15:35-15:50**  WeBT4.6
**Carbon Nanospikes for Biosensing Applications**
Shanta, Aysha Siddique* *(The University of Tennessee)*; Mamun, Khandaker *(University of Tennessee)*; Hensley, Dale *(oak ridge National laboratory)*; Lavrik, Nickolay *(oak ridge National laboratory)*; Islam, Syed Kamrul *(University of Tennessee)*; McFarlane, Nicole *(University of Tennessee)*

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**WeBT8:**  14:20-15:50  Schwan Room
**Motor Neuroprostheses** (Oral Session)
**Chair:** Youn, Inchan *(Korea Institute of Science and Technology)*

**14:20-14:35**  WeBT8.1
**Multiscale Decoding for Reliable Brain-Machine Interface Performance Over Time**
Hsieh, Han-Lin* *(Univ. of Southern California)*; Wong, Yan Tat *(New York Univ.)*; Pesaran, Bijan *(New York Univ.)*; Shanechi, Maryam *(Univ. of Southern California)*

**14:35-14:50**  WeBT8.2
**An Unsupervised Learning Algorithm for Multiscale Neural Activity**
Abbaspourazad, Hamidreza* *(Univ. of Southern California)*; Shanechi, Maryam *(Univ. of Southern California)*

**14:50-15:05**          WeBT8.3
**Electromyographic Bridge—A Multi-Movement Volitional Control Method for Functional Electrical Stimulation: Prototype System Design and Experimental Validation**
Zhou, Yuxuan *(School of Basic Medical Science, Nanjing Medical Univ.)*; Wang, Haipeng *(Southeast Univ., Institute of RF- & OE-ICs)*; Cao, Xiaopeng *(Southeast Univ.)*; Bi, Zhengyang *(Southeast Southeast Univ., State Key Lab of Bioelectronics)*; Gao, Yujie *(Southeast Univ.)*; Chen, XiaoBin *(Southeast Univ.)*; Lü, Xiaoying* *(Southeast Univ.)*; Wang, Zhigong *(Southeast Univ.)*

**15:05-15:20**          WeBT8.4
**Low-Intensity Focused Ultrasound Stimulator using Focal Depth Controller for Improved Targeting in Neuromuscular Rehabilitation**
Oh, Sungjin *(Korea Institute of Science and Technology)*; Kim, DongHwee *(Korea Institute of Science and Technology)*; Youn, Inchan* *(Korea Institute of Science and Technology)*

**15:20-15:35**          WeBT8.5
**Towards a Wearable Hand Exoskeleton with Embedded Synergies**
Burns, Martin *(Stevens Institute of Technology)*; Van Orden, Katie *(Stevens Institute of Technology)*; Patel, Vrajeshri *(Stevens Institute of Technology)*; Vinjamuri, Ramana* *(Stevens Institute of Technology)*

**WeBT9**: 14:20-15:50       Plonsey Room
**Neural Interfaces I** (Oral Session)
**Chair:** Kim, Keehoon *(Korea Institute of Science and Technology)*

**14:20-14:35**          WeBT9.1
**An Integrated Multichannel Neural Recording Analog Front-End ASIC with Area-Efficient Driven Right Leg Circuit**
Tang, Tao* *(NTU)*; Goh, Wang Ling *(Nanyang Technological University)*; Yao, Lei *(Institute of Microelectronics, Singapore)*; Cheong, Jia Hao *(Institute of Microelectronics)*; Gao, Yuan *(Institute of Microelectronics, Singapore)*

**14:35-14:50**          WeBT9.2
**Rodent Wearable Ultrasound System for Wireless Neural Recording**
Piech, David* *(University of California - Berkeley)*; Kay, Joshua *(University of California - Berkeley)*; Boser, Bernhard *(UC Berkeley)*; Maharbiz, Michel *(University of California, Berkeley)*

**14:50-15:05**          WeBT9.3
**A Handheld Device for Magnetically Inserting a Neural Interface into a Peripheral Nervous System**
Yim, Sehyuk *(Korea Institute of Science and Technology)*; Hwang, Donghyun *(Korea Institute of Science and Technology)*; Ihn, Yong Seok *(Korea Institute of Science and Technology)*; Jeong, Jinwoo *(Sungkyunkwan University)*; Oh, Sang-Rok *(Korea Institute of Science and Technology)*; Kim, Keehoon* *(Korea Institute of Science and Technology)*

**15:05-15:20**          WeBT9.4
**Unidirectional Ephaptic Stimulation between Two Myelinated Axons**
Capllonch Juan, Miguel* *(Univ. of Essex)*; Kolbl, Florian *(Univ. of Bordeaux)*; Sepulveda, Francisco *(Univ. of Essex)*

**15:20-15:35**          WeBT9.5
**Novel Integration and Packaging Concepts of Highly Miniaturized Inductively Powered Neural Implants**
Khalifa, Adam* *(Johns Hopkins Univ.)*; Karimi, Yasha *(Stony Brook Univ.)*; Stanacevic, Milutin *(Stony Brook Univ.)*; Etienne-Cummings, Ralph *(Johns Hopkins Univ.)*

**15:35-15:50**          WeBT9.6
**Design of Contact Zone Topography for Implantable High-Channel Electrical Connectors**
Koch, Julia* *(Univ. of Freiburg)*; Schuettler, Martin *(Univ. of Freiburg)*; Stieglitz, Thomas *(Univ. of Freiburg)*

WeBT10: 14:20-15:50       Schmitt Room
**Voice Frequency Analysis: Expectation for the Convenient but Powerful Diagnostic Tool for Neuropsychiatric Disorders** (Invited Session)
**Chair:** Morimoto, Yuji *(National Defense Medical College)*
**Co-Chair:** Tokuno, Shinichi *(The University of Tokyo)*

**14:20-14:35**          WeBT10.1
**Introduction of Pathophysiological Voice Analysis for Disease**
Tokuno, Shinichi* *(The Univ. of Tokyo)*; Mitsuyoshi, Shunji *(Dept. of Verbal Analysis of Pathophysiology Graduate School of M)*

**14:35-14:50**          WeBT10.2
**Algorithm to Distinguish between Articulatory Disorder, Depression and Parkinson's Disease by Voice**
Omiya, Yasuhiro* *(PST Inc.)*; Hagiwara, Naoki *(PST Inc.)*

**14:50-15:05**          WeBT10.3
**Novel Voice Indicator for Distinguishing Parkinson's Disease**
Shinohara, Shuji* *(The University of Tokyo)*; Tokuno, Shinichi *(The University of Tokyo)*

**15:05-15:20**          WeBT10.4
**Voice Acoustics as Predictor of Clinical Depression Score**
Nik Hashim, Nik Nur Wahidah* *(Intl. Islamic Univ. Malaysia)*

**15:20-15:35**          WeBT10.5
**Difference in Voice Analysis Result by Pre and Post Processing of Telephone Line**
Hagiwara, Naoki* *(PST Inc.)*; Omiya, Yasuhiro *(PST Inc.)*; Shinohara, Shuji *(The Univ. of Tokyo)*; Nakamura, Mitsuteru *(The Univ. of Tokyo)*; Higuchi, Masakazu *(The Univ. of Tokyo)*; Mitsuyoshi, Shunji *(Dept. of Verbal Analysis of Pathophysiology Graduate School of M)*; Tokuno, Shinichi *(The Univ. of Tokyo)*

WeBT11: 14:20-15:50       Greatbatch Room
**Pulse Transit Time/Arterial Stiffness** (Oral Session)
**Chair:** Avolio, Alberto P *(Macquarie University)*
**Co-Chair:** Sivaprakasam, Mohanasankar *(Indian Institute of Technology Madras)*

**14:20-14:35**          WeBT11.1
**Reproducibility of Photoplethysmography-Based Local Pulse Transit Time Measurement**
Beckmann, Nils* *(Univ. of Duisburg-Essen)*; Viga, Reinhard *(Univ. of Duisburg-Essen)*; Dogangün, Aysegül *(Univ. of Duisburg-Essen)*; Grabmaier, Anton *(Univ. of Duisburg-Essen)*

**14:35-14:50**          WeBT11.2
**Pulse Arrival Time (PAT) Measurement based on Arm ECG and Finger PPG Signals – Comparison of PPG Feature Detection Methods for PAT Calculation**
Rajala, Satu* *(Nokia Technologies)*; Ahmaniemi, Teemu *(Nokia Technologies)*; Lindholm, Harri *(Nokia Technologies)*; Taipalus, Tapio *(Nokia Technologies)*

**14:50-15:05**          WeBT11.3
**Pulse Arrival Time Measurement with Coffee Provocation**
Ahmaniemi, Teemu* *(Nokia Technologies)*; Rajala, Satu *(Nokia Technologies)*; Lindholm, Harri *(Nokia Technologies)*; Taipalus, Tapio *(Nokia Technologies)*

**15:05-15:20**          WeBT11.4
**Increased Arterial Stiffness does not Respond to Renal Denervation in an Animal Model of Secondary Hypertension**
Yao, Yimin *(Dept. of BioMedical Sciences, Faculty of Medicine and Health)*; Hildreth, Cara *(Dept. of BioMedical Sciences, Faculty of Medicine and Health)*; Li, Sheran *(Dept. of BioMedical Sciences, Faculty of Medicine and Health)*; Boyd, Rochelle *(Dept. of BioMedical Sciences, Faculty of Medicine and Health)*; Kouchaki, Zahra *(Macquarie University)*; Butlin, Mark *(Macquarie University)*; Avolio, Alberto P* *(Macquarie University)*; Pilowksy, Paul M *(Heart Research Institute and University of Sydney)*; Phillips, Jacqueline Kathleen *(Faculty of Medicine and Health Sciences, Macquarie University)*

**15:20-15:35**  WeBT11.5
**Brachial Artery Stiffness Estimation using ARTSENS**
V, Raj Kiran* *(IIT Madras)*; PM, Nabeel *(Indian Institute of Tech. Madras)*; Joseph, Jayaraj *(HTIC, Indian Institute of Tech. Madras)*; Shah, Malay Ilesh *(Healthcare Tech. Innovation Center (HTIC), Indian Institute)*; Sivaprakasam, Mohanasankar *(Indian Institute of Tech. Madras)*

**15:35-15:50**  WeBT11.6
**Modeling Young and Adult Patients with Cirrhosis through a Three Element Windkessel (WK3e)**
Cymberknop, Leandro Javier *(Universidad Tecnológica Nacional)*; Farro, Ignacio *(School of Medicine, Republic University)*; Arbeitman, Claudia *(Engineering and Exact and Natural Sciences Faculty, Favaloro Uni)*; Cardelino, Juan *(Faculty of Engineering, Republic University)*; Armentano, Ricardo Luis* *(Republic University)*

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**WeBT12:** 14:20-15:50  Geddes Room
**Ambulatory Diagnostic and Therapeutic Systems** (Oral Session)
**Chair:** Chbat, Nicolas W. *(Center of Excellence in Critical Care Innovation)*

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**14:20-14:35**  WeBT12.1
**SVM Classifier on Chip for Melanoma Detection**
Afifi, Shereen *(Auckland University of Technology)*; GholamHosseini, Hamid* *(Auckland University of Technology)*; Sinha, Roopak *(Auckland University of technology)*

**14:35-14:50**  WeBT12.2
**Developing Interactive and Simple Electromyogram PONG Game for Foot Dorsiflexion and Plantarflexion Rehabilitation Exercise**
Hee, Cheok Lek *(Monash Univ. Malaysia)*; Chong, Tune Hau *(Monash Univ. Malaysia)*; Gouwanda, Darwin* *(Monash Univ. Malaysia)*; Gopalai, Alpha Agape *(Curtin Univ. Sarawak Campus)*; Low, Cheng Yee *(Univ. Teknologi MARA)*; Hanapiah, Fazah Akhtar *(Univ. Teknologi Mara)*

**14:50-15:05**  WeBT12.3
**Automatic Detection and Labeling of Self-Stimulatory Behavioral Patterns in Children with Autism Spectrum Disorder**
Min, Cheol-Hong* *(University of St. Thomas)*

**15:05-15:20**  WeBT12.4
**Design of Focal Brain Cooling System for Suppressing Epileptic Seizures**
Hata, Kei *(Kyoto Univ.)*; Fujiwara, Koichi* *(Kyoto Univ.)*; Kano, Manabu *(Kyoto Univ.)*; Inoue, Takao *(Yamaguchi Univ.)*; Nomura, Sadahiro *(Yamaguchi Univ.)*; Imoto, Hirochika *(Yamaguchi Univ.)*; Suzuki, Michiyasu *(Yamaguchi Univ.)*

**15:20-15:35**  WeBT12.5
**Smartphone App to Investigate the Relationship between Social Connectivity and Mental Health**
Boonstra, Tjeerd W. *(University of New South Wales)*; Werner-Seidler, Aliza *(University of New South Wales)*; O'Dea, Bridianne *(University of New South Wales)*; Larsen, Mark Erik* *(University of New South Wales)*; Christensen, Helen *(University of New South Wales)*

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**WeBT13:** 14:20-15:50  Dunn Room
**Drug Delivery Routes, Release and Formulation** (Oral Session)

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**14:20-14:35**  WeBT13.1
**Spatial Targeting of Tumor-Associated Macrophage and Tumor Cells with a Designer Nanocarrier for Cancer Chemo-Immunotherapy**
Wang, Jun* *(South China University of Technology)*

**14:35-14:50**  WeBT13.2
**Needle-Free Small-Volume Liquid Injection System Powered by a Rotary Actuator**
Zhang, Aoyu* *(Peking University)*; Hogan, N. Catherine *(Massachusetts Institute of Technology)*; Hunter, Ian *(Massachusetts Institute of Technology)*

**14:50-15:05**  WeBT13.3
**High Speed X-Ray Analysis of Liquid Delivery during Jet Injection**
Mckeage, James William* *(Auckland Bioengineering Institute)*; Brennan, Kieran *(The University of Auckland)*; Park, Geehoon *(Massachusetts Institute of Technology)*; Hogan, N. Catherine *(Massachusetts Institute of Technology)*; Hunter, Ian *(Massachusetts Institute of Technology)*; Ruddy, Bryan *(University of Auckland)*; Nielsen, Poul *(The University of Auckland)*; Taberner, Andrew *(The University of Auckland)*

**15:05-15:20**  WeBT13.4
**Nonlithographic Fabrication of Inflatable and Deflatable Polydimethylsiloxane (PDMS) Micro-Channels for a Magnetically Actuated Drug Delivery System**
Kim, Hyun *(Seoul National University)*; Kim, Pyojin *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

**15:20-15:35**  WeBT13.5
**Ampoule and Nozzle Development for Needle-Free Injections**
Liu, John* *(Massachusetts Institute of Technology)*; Hogan, N. Catherine *(Massachusetts Institute of Technology)*; Hunter, Ian *(Massachusetts Institute of Technology)*

**15:35-15:50**  WeBT13.6
**Nanoparticle-Based Delivery of an Anti-Proliferative Metal Chelator to Tumor Cells**
Kang, You Jung *(Pennsylvania State Univ.)*; Kuo, Chung-Fan *(Univ. of Houston)*; Majd, Sheereen* *(Univ. of Houston)*

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**WeBT14:** 14:20-15:50  Schaldach Room
**Deformable Models for Image Analysis** (Oral Session)
**Chair:** Gonzalez Ballester, Miguel Angel *(Univ. Pompeu Fabra)*

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**14:20-14:35**  WeBT14.1
**Rodent Brain Extraction using B-Spline based Deformable Model**
Huang, Weimin* *(Institute for Infocomm Research, Agency for Science Technology a)*; Ling, Chen *(NTU)*; Huang, Su *(Institute for Infocomm Research, A*STAR, Singapore)*; Lu, Zhongkang *(Institute for Infocomm Research)*; Lin, Zhiping *(Nanyang Technological University)*

**14:35-14:50**  WeBT14.2
**Individual Muscle Segmentation in MR Images: A 3D Propagation through 2D Non-Linear Registration Approaches**
Ogier, Augustin* *(Aix Marseille Univ, CNRS, Marseille, France)*; Sdika, Michaël *(Creatis)*; Fouré, Alexandre *(Aix Marseille Univ, CRMBM, Marseille, France)*; Le Troter, Arnaud *(Aix Marseille Univ, CNRS, CRMBM, Marseille, France)*; Bendahan, David *(Aix Marseille Univ, CNRS, CRMBM, Marseille, France)*

**14:50-15:05**  WeBT14.3
**A Novel Non-Rigid Registration Algorithm for ZebraFish Larval Images**
Ghosal, Sayan *(Jadavpur University)*; Banerjee, Soumava *(Jadavpur University)*; Tiso, Natascia *(University of Padova)*; Grisan, Enrico* *(University of Padova)*; Chowdhury, Ananda *(Jadavpur University)*

**15:05-15:20**  WeBT14.4
**Parallel Implementation of a Nonrigid Image Registration Algorithm for Lung Tumor Boundary Tracking in Quasi Real-Time MRI**
Tahmasebi, Nazanin* *(Univ. of Alberta)*; Boulanger, Pierre *(Univ. of Alberta)*; Punithakumar, Kumaradevan *(Univ. of Alberta)*

**15:20-15:35**  WeBT14.5
**Characterization of Single Cell Dynamic Morphology by Local Deformation Pattern Modeling**
Li, Heng *(Beijing Institute of Technology)*; Liu, Zhiwen* *(Beijing Institute of Technology)*; Pang, Fengqian *(Beijing Institute of Technology)*; Shi, Yonggang *(Beijing Institute of Technology)*

**15:35-15:50**  WeBT14.6
**A Statistical Shape Model of the Skull Developed from a South African Population**
Lugadilu, Brian Ingasia *(Univ. of Capetown)*; Richards, Craig *(Univ. of Capetown)*; Reyneke, Corius *(Univ. of Capetown)*; Douglas, Tania S *(Univ. of Cape Town)*; Mutsvangwa, Tinashe Ernest Muzvidzwa* *(Univ. of Cape Town)*

**WeBT15:**  14:20-15:50  Webster Room
**Pulmonary Systems** (Oral Session)
**Chair:**  Heldt, Thomas *(Massachusetts Institute of Technology)*
**Co-Chair:**  Jané, Raimon *(Institute for Bioengineering de Catalunya (IBEC))*

**14:20-14:35**  WeBT15.1
**Investigating the Effect of Cardiac Oscillations and Deadspace Gas Mixing during Apnea using Computer Simulation**
Laviola, Marianna* *(University of Nottingham)*; Das, Anup *(University of Warwick)*; Chikhani, Marc *(University of Nottingham)*; Bates, Declan Gerard *(University of Warwick)*; Hardman, Jonathan G. *(University of Nottingham)*

**14:35-14:50**  WeBT15.2
**Evaluation of Indirect Measures of Neural Inspiratory Time from Invasive and Noninvasive Recordings of Respiratory Activity**
García-Castellote, Daniel *(Univ. Politècnica de Catalunya)*; Torres, Abel* *(Inst. for Bioeng. of Catalonia (IBEC) - BarcelonaTech)*; Estrada, Luis *(Inst. for Bioeng. de Catalunya)*; Sarlabous, Leonardo *(Inst. for Bioeng. of Catalonia (IBEC))*; Jané, Raimon *(Inst. for Bioeng. de Catalunya (IBEC))*

**14:50-15:05**  WeBT15.3
**Statistical Analysis of the Age Dependence of the Normal Capnogram**
Mieloszyk, Rebecca *(Philips Healthcare, Univ. of Washington)*; Krauss, Baruch *(Harvard Medical School)*; Montagu, Diana *(Tufts Univ. School of Dental Medicine)*; Andolfatto, Gary *(Univ. of British Columbia, Lions Gate Hospital)*; Barbi, Egidio *(IRCCS Burlo Garofolo Children's Hospital, Trieste)*; Verghese, George *(MIT)*; Heldt, Thomas* *(MIT)*

**15:05-15:20**  WeBT15.4
**Imaging of Regional Air Distributions in Porcine Lungs using High Performance Electrical Impedance Tomography System**
Jang, Geuk Young *(Dept. of Biomedical Engineering, Graduate School, Kyung Hee)*; Kim, Young-Bok *(Kyung-Hee Univ, IIRC)*; Wi, Hun *(Kyunghee University)*; Oh, Tong In *(Kyunghee University)*; Chi Ryang, Chung *(Samsung Medical Center, Sungkyunkwan University School of Medici)*; Suh, Gee Young *(Samsung Medical Center, Sungkyunkwan University School of Medici)*; Woo, Eung Je* *(Kyung Hee University)*

**15:20-15:35**  WeBT15.5
**Monitoring of Cardiac Output and Lung Ventilation by Electrical Impedance Tomography in a Porcine Model of Acute Lung Injury**
Hochhausen, Nadine* *(RWTH Aachen Univ., Section Medical Technology at the Depart)*; Dohmeier, Henriette *(RWTH Aachen Univ., Section Medical Technology at the Depart)*; Rossaint, Rolf *(RWTH Aachen Univ., Dept. of Anesthesiology)*; Czaplik, Michael *(Univ. Hospital RWTH Aachen)*

**WeBT16:**  14:20-15:50  Rushmer Room
**Retinal Imaging I** (Oral Session)

**14:20-14:35**  WeBT16.1
**A Novel Method for Segmentation of Infrared Scanning Laser Ophthalmoscope (ir-Slo) Images of Retina**
Ajaz, Aqsa* *(RMIT University)*; Aliahmad, Behzad *(RMIT University)*; Kant Kumar, Dinesh *(RMIT University)*

**14:35-14:50**  WeBT16.2
**A Fluid-Dynamic based Approach to Reconnect the Retinal Vessels in Fundus Photography**
Calivà, Francesco* *(University of Lincoln)*; Hunter, Andrew *(University of Lincoln)*; Chudzik, Piotr *(University of Lincoln)*; Ometto, Giovanni *(Aarhus University Hospital)*; Antiga, Luca *(Orobix srl)*; Al-Diri, Bashir *(The University of Lincoln)*

**14:50-15:05**  WeBT16.3
**Vessel Extraction in Retinal Images using Automatic Thresholding and Gabor Wavelet**
Ali, Aziah* *(Universiti Kebangsaan Malaysia)*; Hussain, Aini *(Universiti Kebangsaan Malaysia)*; Wan Zaki, Wan Mimi Diyana *(Universiti Kebangsaan Malaysia)*

**15:05-15:20**  WeBT16.4
**A New Two-Dimensional Matched Filter based on the Modified Chebyshev Type I Function for Retinal Vessels Detection**
Dharmawan, Dhimas Arief* *(Nanyang Technological University)*; Ng, Boon Poh *(Nanyang Technological University)*

**15:20-15:35**  WeBT16.5
**Retinal Biometrics based on Iterative Closest Point Algorithm**
Hatanaka, Yuji* *(University of Shiga Prefecture)*; Tajima, Mikiya *(University of Shiga Prefecture)*; Kawasaki, Ryo *(Yamagata University)*; Saito, Koko *(Shinoda General Hospital)*; Ogohara, Kazunori *(University of Shiga Prefecture)*; Muramatsu, Chisako *(Gifu University)*; Sunayama, Wataru *(The University of Shiga Prefecture)*; Fujita, Hiroshi *(Gifu University)*

**15:35-15:50**  WeBT16.6
**An Experimental Evaluation of the Accuracy of Keypoints-Based Retinal Image Registration**
Hernandez-Matas, Carlos* *(FORTH)*; Zabulis, Xenophon *(Foundation for Resrch & Technology)*; Argyros, Antonis *(University of Crete)*

**WeCT1-01:**  16:10-17:10  Roentgen Hall
**Myographic Signal Analysis I** (Poster Session)

**16:10-16:12**  WeCT1-01.1
**Design of sEMG-Detecting Circuit for EMG-Bridge**
Chen, XiaoBin *(Southeast Univ.)*; Zhou, Yuxuan *(School of Basic Medical Science, Nanjing Medical Univ.)*; Wang, Haipeng *(Southeast Univ., Institute of RF- & OE-ICs)*; Lü, Xiaoying* *(Southeast Univ.)*; Wang, Zhigong *(Southeast Univ.)*

**16:12-16:14**  WeCT1-01.2
**The Effect of the Preparation Instruction on the Functional Connectivity between Forearm Muscles during Movement's Initiation**
Saidane, Yosra* *(SUP'COM)*; Ben Jebara, Sofia *(SUP'COM)*

**16:14-16:16**  WeCT1-01.3
**sEMG Feature Selection and Classification using SVM-RFE**
Tosin, Maurício C *(UFRGS)*; Majolo, Mariano *(UFRGS)*; Chedid, Raissan *(UFRGS)*; Cene, Vinicius H. *(UFRGS)*; Favieiro, Gabriela Winkler* *(Federal University of Rio Grande do Sul (UFRGS))*; Balbinot, Alexandre *(Federal University of Rio Grande do Sul (UFRGS))*

**16:16-16:18**  WeCT1-01.4
**EMG-Based Energy Expenditure Optimization for Active Prosthetic Leg Tuning**
Atri, Roozbeh* *(Florida International University)*; Marquez, Juan S. *(Florida International University)*; Bai, Ou *(Florida International University)*

**16:18-16:20**  WeCT1-01.5
**Muscle Fatigue Assessment through Electrodermal Activity Analysis during Isometric Contraction**
Greco, Alberto* *(Univ. of Pisa)*; Guidi, Andrea *(Univ. of Pisa)*; Felici, Federica *(Istituto Italiano di Tecnologia)*; Leo, Andrea *(IMT School for Advanced Studies)*; Ricciardi, Emiliano *(Univ. of Pisa)*; Bianchi, Matteo *(Univ. of Pisa)*; Bicchi, Antonio *(Univ. of Pisa)*; Citi, Luca *(Univ. of Essex)*; Valenza, Gaetano *(Univ. of Pisa)*; Scilingo, Enzo Pasquale *(Univ. of Pisa)*

**16:20-16:22**  WeCT1-01.6
**Consistency of Surface Electromyography Assessment at Lower Limb Selected Muscles during Vertical Countermovement**
Rodrigues, Carlos M. B.* *(INESCTEC - Technology & Science Associate Laboratory)*; Correia, Miguel *(Universidade do Porto, Faculdade de Engenharia)*; Abrantes, João M. C. S. *(MovLab - ULHT)*; Rodrigues, Marco Aurélio Benedetti *(Federal Univ. of Pernambuco)*; Nadal, Jurandir *(Federal Univ. of Rio de Janeiro)*

**16:22-16:24** WeCT1-01.7

**Increasing the Robustness against Force Variation in EMG Motion Classification by Common Spatial Patterns**

Li, Xiangxin *(Shenzhen Institutes of Advanced Tech., Chinese Academy of Sc)*; Fang, Peng *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Tian, Lan *(Shenzhen Institutes of Advanced Tech., Chinese Academy of)*; Li, Guanglin\* *(Shenzhen Institutes of Advanced Tech.)*

**16:24-16:26** WeCT1-01.8

**Capacitively Coupled EMG Detection via Ultra-Low-Power Microcontroller STFT**

Roland, Theresa\* *(Johannes Kepler Univ. Linz)*; Baumgartner, Werner *(Johannes Kepler Univ. Linz)*; Amsuess, Sebastian *(Univ. Medical Center, Georg August Univ., Goettingen)*; Russold, Michael *(Otto Bock Healthcare Products GmbH)*

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**WeCT1-02:** 16:10-17:10 Roentgen Hall
**Neural Signal Analysis I** (Poster Session)

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**16:10-16:12** WeCT1-02.1

**Personalized Features for Attention Detection in Children with Attention Deficit Hyperactivity Disorder**

Fahimi, Fatemeh\* *(Nanyang Technological University)*; Guan, Cuntai *(Nanyang Technological University)*; Goh, Wooi Boon *(Nanyang Technological University)*; Ang, Kai Keng *(Institute for Infocomm Research)*; Lim, Choon Guan *(Institute of Mental Health)*; Lee, Tih Shih *(Duke-NUS Graduate Medical School)*

**16:12-16:14** WeCT1-02.2

**Modular Framework for Detection of Inter-Ictal Spikes in iEEG**

Kesner, Filip\* *(Faculty of Information Tech., Brno Univ. of Tech.)*; Sekanina, Lukas *(Faculty of Information Tech., Brno Univ. of Tech.)*; Brazdil, Milan *(Masaryk Univ. Brno)*

**16:14-16:16** WeCT1-02.3

**Bispectral Analysis of Spontaneous EEG Activity from Patients with Moderate Dementia Due to Alzheimer's Disease**

Gomez, Carlos\* *(Univ. of Valladolid)*; Vaquerizo-Villar, Fernando *(Biomedical Engineering Group, Univ. of Valladolid)*; Poza, Jesus *(Univ. of Valladolid)*; Ruiz, Saúl J. *(Biomedical Engineering Group, Univ. of Valladolid)*; Tola-Arribas, Miguel A. *(Dept. of Neurology, Hospital Universitario Río Hortega)*; Cano, Mónica *(Dept. of Clinical Neurophysiology, Hospital Universitario R)*; Hornero, Roberto *(Univ. of Valladolid)*

**16:16-16:18** WeCT1-02.4

**A Fully Automated Method for Segmentation and Classification of Local Field Potential Recordings: Preliminary Results**

Díaz-Parra, Antonio *(Univ. Politècnica de València)*; Canals, Santiago *(Instituto de Neurociencias, Consejo Superior de Investigaciones)*; Moratal, David\* *(Univ. Politècnica de València)*

**16:18-16:20** WeCT1-02.5

**On the Impact of Spike Segmentation on Motor Unit Identification in Dynamic Surface Electromyograms**

Glaser, Vojko\* *(University of Maribor, Faculty of Electrical Engineering and Comp)*; Holobar, Ales *(University of Maribor, Faculty of Electrical Engineering and Compu)*

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**WeCT1-03:** 16:10-17:10 Roentgen Hall
**Signal Pattern Classification – Cardiovascular Signals II** (Poster Session)

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**16:10-16:12** WeCT1-03.1

**Automated Diagnosis of Coronary Artery Disease using Pattern Recognition Approach**

Desai, Usha\* *(NMAM Inst. of Univ. Nitte)*; Nayak, C Gurudas *(Manipal Inst. of Univ., Manipal Univ.)*; Seshikala, G *(REVA Univ.)*; Martis, Roshan Joy *(Ngee Ann Polytechnic)*

**16:12-16:14** WeCT1-03.2

**Irregular Heartbeat Classification using Kronecker Product Equations**

Boussé, Martijn\* *(KU Leuven)*; Goovaerts, Griet *(KU Leuven)*; Vervliet, Nico *(KU Leuven)*; Debals, Otto *(KU Leuven)*; Van Huffel, Sabine *(KU Leuven)*; De Lathauwer, Lieven *(KU Leuven)*

**16:14-16:16** WeCT1-03.3

**Classification of Respiratory Disturbances in Rett Syndrome Patients using Restricted Boltzmann Machine**

O'Leary, Heather\* *(Boston Children's Hospital)*; Mayor Torres, Juan Manuel *(Boston Children's Hospital)*; Poon, Chi-Sang *(Massachusetts Institute of Technology)*; Kaufmann, Walter *(Greenwood Genetic Center)*; Sahin, Mustafa *(Boston Children's Hospital)*

**16:16-16:18** WeCT1-03.4

**ECG Authentication in Post-Exercise Situation**

Sung, Dongsuk *(Seoul National University)*; Kim, Jeehoon *(Seoul National University)*; Koh, Myungjun *(Seoul National University)*; Park, Kwang S.\* *(Seoul National University)*

**16:18-16:20** WeCT1-03.5

**Bivariate Empirical Mode Decomposition for ECG-Based Biometric Identification with Emotional Data**

Ferdinando, Hany\* *(University of Oulu)*; Seppänen, Tapio *(University of Oulu)*; Alasaarela, Esko *(University of Oulu)*

**16:20-16:22** WeCT1-03.6

**Cancelable ECG Biometrics using GLRT and Performance Improvement using Guided Filter with Irreversible Guide Signal**

Kim, Hanvit\* *(Ulsan National Institute of Science and Technology)*; Nguyen, Minh Phuong *(Ulsan National Institute of Science and Technology (UNIST))*; Chun, Se Young *(Ulsan National Institute of Science and Technology (UNIST))*

**16:22-16:24** WeCT1-03.7

**Similarity based Hierarchical Clustering of Physiological Parameters for the Identification of Health States – A Feasibility Study**

Schrumpf, Fabian\* *(Leipzig University of Applied Sciences (HTWK))*; Bausch, Gerold *(Leipzig University of Applied Sciences)*; Sturm, Matthias *(Leipzig University of Applied Sciences (HTWK))*; Fuchs, Mirco *(Laboratory for Biosignal Processing, Leipzig University of Appli)*

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**WeCT1-04:** 16:10-17:10 Roentgen Hall
**Signal Pattern Classification – EEG II** (Poster Session)

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**16:10-16:12** WeCT1-04.1

**EEG Emotion Recognition using Reduced Channel Wavelet Entropy and Average Wavelet Coefficient Features with Normal Mutual Information Method**

Candra, Henry *(Univ. of Technology Sydney)*; Yuwono, Mitchell *(Univ. of Technology Sydney)*; Chai, Rifai *(Univ. of Technology, Sydney)*; Nguyen, Hung T.\* *(Univ. of Technology, Sydney)*; Su, Steven Weidong *(Univ. of Technology, Sydney)*

**16:12-16:14** WeCT1-04.2

**Fast Spike Detection in EEG using Eigenvalue Analysis and Clustering of Spatial Amplitude Distribution**

Fukami, Tadanori\* *(Yamagata University)*; Shimada, Takamasa *(Tokyo Denki University)*; Ishikawa, Bunnoshin *(Hotoku-kai Utsunomiya Hospital)*

**16:14-16:16** WeCT1-04.3

**Rotational Data Augmentation for Electroencephalographic Data**

Krell, Mario Michael *(University of California Berkeley)*; Kim, Su Kyoung\* *(German Research Center for Artificial Intelligence (DFKI) GmbH)*

**16:16-16:18** WeCT1-04.4

**Surface and Intracranial EEG Spike Detection based on Discrete Wavelet Decomposition and Random Forest Classification**

Le Douget, Jean-Eudes\* *(Bioelectrics Lab, ICM Paris & Bioserenity)*; Fouad, Amal *(Faculty of Medicine, Ain-Shams University)*; Maskani Filali, Mohamed *(Bioelectrics Lab, ICM Paris & Bioserenity)*; Pyrzowski, Jan *(Bioelectrics Lab, ICM Paris & Bioserenity)*; Le Van Quyen, Michel *(ICM Research Center)*

**16:18-16:20**                          **WeCT1-04.5**

**Analysis of Electroencephalogram of Patients with Specific Low Back Pain with the Massage Treatment**

Xiangjun, Sun *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Li, Huihui\* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Du, Wenjing *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Wenmin, Chen *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Zhou, Fang *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Wang, Lei *(Shenzhen Institutes of Advanced Tech.)*

**16:20-16:22**                          **WeCT1-04.6**

**EEG-Based Auditory Attention Decoding using Unprocessed Binaural Signals in Reverberant and Noisy Conditions**

Aroudi, Ali\* *(University of Oldenburg, Dept. of Medical Physics and Acoustics)*; Doclo, Simon *(University of Oldenburg)*

**16:22-16:24**                          **WeCT1-04.7**

**EEG-Based Emotion Classification using Innovative Features and Combined SVM and HMM Classifier**

Guo, Kairui\* *(University of Technology, Sydney)*; Candra, Henry *(University of Technology Sydney)*; Yu, Hairong *(University of Technology, Sydney)*; Li, Huiqi *(Beijing Institute of Technology)*; Nguyen, Hung T. *(University of Technology, Sydney)*; Su, Steven Weidong *(University of Technology, Sydney)*

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**WeCT2-01:**  16:10-17:10                     Cho Room
**Neuroimaging: MRI, MEG and EEG I** (Poster Session)

**16:10-16:12**                          **WeCT2-01.1**

**A Radiomics Evaluation of 2D and 3D MRI Texture Features to Classify Brain Metastases from Lung Cancer and Melanoma**

Ortiz-Ramón, Rafael *(Universitat Politècnica de València)*; Larroza, Andres *(Universidad de Valencia)*; Arana, Estanislao *(Radiology Dept., Fundación Instituto Valenciano de Oncologí)*; Moratal, David\* *(Universitat Politècnica de València)*

**16:12-16:14**                          **WeCT2-01.2**

**Investigating BOLD Spectral Power of Intrinsic Connectivity Networks in Fibromyalgia: A Multivariate Analysis of Resting-State fMRI Data**

Jarrahi, Behnaz\* *(Stanford Univ.)*; Martucci, Katherine *(Stanford School of Medicine)*; Nilakantan, Aneesha *(Stanford School of Medicine)*; Mackey, Sean *(Stanford Univ. School of Medicine)*

**16:14-16:16**                          **WeCT2-01.3**

**Atlas based Sparse Logistic Regression for Alzheimer's Disease Classification**

Barros, Helena *(ISR - Institute for Systems and Robotisc, Instituto Superior Téc)*; Silveira, Margarida\* *(Institute for Systems and Robotics - Instituto Superior Técnico)*

**16:16-16:18**                          **WeCT2-01.4**

**PEAR: PEriodic and ApeRiodic Signal Separation for Fast fMRI**

Weizman, Lior\* *(Technion, Israel Institute of Technology)*; Miller, Karla *(Oxford University Centre for Functional MRI of the Brain (FMRIB))*; Eldar, Yonina *(Technion, Israel Institute of Technology)*; Maayan, Osher *(Technion, Israel Institute of Technology)*; Chiew, Mark *(Oxford University Centre for Functional MRI of the Brain (FMRIB))*

**16:18-16:20**                          **WeCT2-01.5**

**Cortical Response of the Projected-Thumb Tactile Sensation under TENS by MEG**

Chen, Ying *(Shanghai Jiaotong University)*; Li, Mengnan *(Shanghai Jiaotong University)*; Cao, Chunyan *(Dept. of Functional Neurosurgery, RuiJin Hospital Shanghai)*; Zhu, Xiaolei *(Dept. of Radiology, RuiJin Hospital Shanghai Jiao Tong Univ)*; Sui, Xiaohong\* *(Shanghai Jiao Tong University)*

**16:20-16:22**                          **WeCT2-01.6**

**Precise Localization of Silicone-Based Intercranial Planar Electrodes in Magnetic Resonance Imaging**

Erhardt, Johannes B.\* *(University of Freiburg)*; Koenig, Kathrin *(University of Freiburg)*; Leupold, Jochen *(University of Freiburg)*; Pasluosta, Cristian Federico *(University of Freiburg)*; Stieglitz, Thomas *(University of Freiburg)*

**16:22-16:24**                          **WeCT2-01.7**

**A Study of Feature Extraction for Alzheimer's Disease based on Resting-State fMRI**

Mao, Shuai *(Harbin Institute of Technology Shenzhen Graduate School)*; Zhang, Changle *(Harbin Institute of Technology Shenzhen Graduate School)*; Gao, Na *(Harbin Institute of Technology)*; Wang, Yan *(Harbin Institute of Technology Shenzhen Graduate School)*; Yang, YanWu *(HITSZ, ShenZhen, GuangDong Province, China)*; Guo, Xin *(Harbin Institute of Technology Shenzhen Graduate School)*; Ma, Heather Ting\* *(Harbin Institute of Technology Shenzhen Graduate School)*

**16:24-16:26**                          **WeCT2-01.8**

**Music and the Brain – Design of an MEG Compatible Piano**

Chacon-Castano, Julian *(Massachusetts Institute of Tech.)*; Rathbone, Daniel *(Massachusetts Institute of Tech.)*; Hoffman, Rachel *(Massachusetts Institute of Tech.)*; Yang, Heng *(Massachusetts Institute of Tech.)*; Pantazis, Dimitrios *(MIT)*; Yang, Jason *(Massachusetts Institute of Tech.)*; Hornberger, Erik *(Sumitomo Heavy Industries, Ltd.)*; Hanumara, Nevan\* *(Massachusetts Institute of Tech.)*

**16:26-16:28**                          **WeCT2-01.9**

**Three-Way ROC Validation of RS-fMRI Visual Information Propagation Transfer Functions used to Differentiate between RRMS and CIS Optic Neuritis Patients**

Shahrabi Farahani, Ehsan *(Univ. of Calgary)*; Choudhury, Samiul *(Univ. of Calgary)*; Cortese, Filomeno *(Univ. of Calgary)*; Costello, Fiona *(Univ. of Calgary)*; Goodyear, Brad *(Univ. of Calgary)*; Smith, Michael\* *(Univ. of Calgary)*

**16:28-16:30**                         **WeCT2-01.10**

**Feasibility Study of Imaging Fast Neural Activity in Retinal Tissue using Electrical Impedance Tomography**

Zhu, Danyi\* *(The University of Sydney)*; Fang, Xiunan *(School of Electrical and Information Engineering, The University)*; Eiber, Calvin D. *(University of New South Wales)*; Avery, James *(University College London)*; Holder, David *(University College London)*; McEwan, Alistair *(The University of Sydney)*

**16:30-16:32**                         **WeCT2-01.11**

**Evaluating Network Brain Connectivity in Alcohol Postdependent State using Network-Based Statistic**

Díaz-Parra, Antonio *(Universitat Politècnica de València)*; Pérez-Ramírez, Úrsula *(Universitat Politècnica de València)*; Pacheco, Jesús *(Instituto de Neurociencias, Consejo Superior de Investigaciones)*; Pfarr, Simone *(Depts. of Psychopharmacology & Addiction Medicine, Central Insti)*; Sommer, Wolfgang H. *(Depts. of Psychopharmacology & Addiction Medicine, Central Insti)*; Moratal, David\* *(Universitat Politècnica de València)*; Canals, Santiago *(Instituto de Neurociencias, Consejo Superior de Investigaciones)*

**16:32-16:34**                         **WeCT2-01.12**

**Relationship between Amplitude of Resting-State fNIRS Global Signal and EEG Vigilance Measures**

Chen, Yuxuan *(Univ. of Oklahoma)*; Farrand, Jesse *(Univ. of Oklahoma)*; Tang, Julia *(Univ. of Oklahoma)*; Chen, Yafen *(Univ. of Oklahoma)*; O'Keeffe, Johnny *(The Univ. of Oklahoma)*; Shou, Guofa *(Univ. of Oklahoma)*; Ding, Lei *(Univ. of Oklahoma)*; Yuan, Han\* *(Univ. of Oklahoma)*

**16:34-16:36**                         **WeCT2-01.13**

**Assessment of Chemoradiotherapy Response in Glioma with Magnetic Resonance Amide Proton Transfer Imaging in a Rodent Model**

Zhao, Jing *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Chen, Yinsheng *(Sun Yat-Sen University)*; Zhao, Yiying *(Sun Yat-Sen University)*; Yang, Shasha *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Chen, Zhongping *(Sun Yat-Sen University)*; Wu, Yin\* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*

**16:36-16:38**                         **WeCT2-01.14**

**EEG Source Estimation Accuracy in Presence of Simulated Cortical Lesions**

Caschera, Stefano\* *(Sapienza University of Rome)*; Petti, Manuela *(Univ. of Rome "Sapienza", Neuroelectrical Imaging and BCI Lab IR)*; Mattia, Donatella *(Fondazione Santa Lucia IRCCS)*; Astolfi, Laura *(University of Rome Sapienza)*

## WeCT2-02: 16:10-17:10      Cho Room
### X-Ray and CT Imaging II (Poster Session)

16:10-16:12      WeCT2-02.1
**Structure and Location Preserving Topological Representation with Applications on CT Segmentation**
Awawdeh, Shatha Fawzi *(BMIT Research Group, School of Information Technologies, Univers)*; Cui, Hui* *(The University of Sydney)*; Wang, Xiu Ying *(The University of Sydney)*; Feng, Dagan *(The University of Sydney)*

16:12-16:14      WeCT2-02.2
**Monte Carlo Simulation of Radiation Dose Distribution in X-Ray Imaging at Shanghai Synchrotron Radiation Facility**
Bai, Huiping *(Shanghai Jiao Tong University)*; Chen, Yi *(Shanghai Jiao Tong University)*; Guo, Han *(Shanghai Synchrotron Radiation Facility)*; Zhao, Jun *(Shanghai Jiao Tong University)*; Sun, Jianqi* *(Shanghai Jiao Tong University)*

16:14-16:16      WeCT2-02.3
**A Novel Pixel Value Space Statistics Map of the Pulmonary Nodule for Classification in Computerized Tomography Images**
Jiang, Hongyang *(Sino-Dutch Biomedical and Information Engineering School, Northe)*; Ma, He* *(Northeastern Univ.)*; Qian, Wei *(Northeastern Univ.)*; Wei, Guohui *(Northeastern Univ.)*; Zhao, Xinzhuo *(Northeastern Univ.)*; Gao, Mengdi *(Sino-Dutch Biomedical and Information Engineering School, Northe)*

16:16-16:18      WeCT2-02.4
**Dose Calculation in Computerized Tomography**
Morató, Sergio* *(Institute for Industrial, Radiophysical and Environmental Safety)*; García, Clara *(ISIRYM)*; Juste, Belen *(Polytechnic Univ. of Valencia)*; Miró, Rafael *(Polytechnic Univ. of Valencia)*; Verdú, Gumersindo *(Polytechnic Univ. of Valencia)*

16:18-16:20      WeCT2-02.5
**Intervertebral Disc Detection in X-Ray Images using Faster R-CNN**
Sa, Ruhan* *(State University of New York (SUNY) at Buffalo)*; Owens Jr, William *(State University of New York (SUNY) at Buffalo)*; Wiegand, Raymond *(Spine Metrics, Inc.)*; Studin, Mark *(University of Bridgeport College of Chiropractic)*; Capoferri, Donald *(Academy of Chiropractic)*; Bahoora, Kenneth *(Academy of Chiropractic)*; Greaux, Alexander *(Academy of Chiropractic)*; Rattray, Robbrey *(Academy of Chiropractic)*; Hutton, Adam *(Academy of Chiropractic)*; Cintineo, John *(Academy of Chiropractic)*; Chaudhary, Vipin *(SUNY Buffalo)*

16:20-16:22      WeCT2-02.6
**Extract-and-Match Geometric Corner and Step Pattern Approach for Registration of Fluoroscopic X-Ray Sequences**
Lee, Jimmy Addison* *(Institute for Infocomm Research, ASTAR)*; Xu, Mengdi *(Institute for Infocomm Research)*; Cheng, Jun *(Institute for Infocomm Research, AStar)*; Fu, Huazhu *(Institute for Infocomm Research, A*STAR)*; Wong, Damon *(Institute for Infocomm Research)*; Foin, Nicolas *(National Heart Centre Singapore)*

16:22-16:24      WeCT2-02.7
**Non-Local Means Filter Denoising for DEXA Images**
Al-Antari, Mugahed A. *(Dept. of Biomedical Engineering, College of Electronics and)*; Al-Masni, Mohammed A. *(Dept. of Biomedical Engineering, Kyung Hee University)*; Kilany, Mohamed *(Kyung Hee University)*; Hussain, Dildar *(Dept. of Biomedical Engineering, Kyung Hee University)*; Valarezo Añazco, Edwin *(Dept. of Biomedical Engineering, Kyung Hee University and E)*; Rivera, Patricio *(Dept. of Biomedical Engineering, Kyung Hee University)*; Gi, Geon *(Dept. of Biomedical Engineering, Kyung Hee University)*; Jeong-min, Park *(Dept. of Biomedical Engineering, Kyung Hee University)*; Kim, Tae-yeon *(Dept. of Biomedical Engineering, Kyung Hee University)*; Park, Se-Je *(B.M.Tech Worldwide Ltd. Co., Seongnam, Republic of Korea)*; Shin, Jeong-Sik *(B.M.Tech Worldwide Ltd. Co., Seongnam, Republic of Korea)*; Han, Seung-Moo *(Dept. of Biomedical Engineering, College of Electronics and)*; Kim, Tae-Seong* *(Kyung Hee University)*

16:24-16:26      WeCT2-02.8
**Automatic Vertebrae Localization from CT Scans using Volumetric Descriptors**
Karsten, Juan *(University of St Andrews)*; Arandjelovic, Ognjen* *(University of St Andrews)*

16:26-16:28      WeCT2-02.9
**Development of Semi-Automatic Procedure for Detection and Tracking of Fiducial Markers for Orofacial Kinematics during Natural Feeding**
Bunyak, Filiz *(University of Missouri Columbia)*; Shiraishi, Naru *(Niigata University)*; Palaniappan, Kannappan *(University of Missouri-Columbia)*; Lever, Teresa *(University of Missouri)*; Avivi-Arber, Limor *(University of Toronto)*; Takahashi, Kazutaka* *(University of Chicago)*

16:28-16:30      WeCT2-02.10
**Patient-Specific Respiratory Motion Estimation using Sparse Motion Field Presentation**
Chen, Dong *(Shanghai Jiao Tong University)*; Xie, Hongzhi *(Peking Union Medical College Hospital)*; Zhang, Shuyang *(Peking Union Medical College Hospital)*; Chen, Weisheng *(Affiliated East Hospital of Xiamen University)*; Gu, Lixu* *(Shanghai Jiaotong University)*

16:30-16:32      WeCT2-02.11
**A Novel Hybrid Approach for Reconstruction of Coronary Bifurcations using Angiography and OCT**
Andrikos, Ioannis *(Univ. of Ioannina)*; Sakellarios, Antonis *(Unit of Medical Tech. and Application Systems, Dept of Mate)*; Siogkas, Panagiotis *(FORTH-IMBB)*; Rigas, Georgios *(Univ. of Ioannina)*; Exarchos, Themis P. *(Unit of Medical Tech & Intelligent Info)*; Athanasiou, Lambros *(Massachusetts Institute of Tech.)*; Karanasos, Antonis *(Medical School, Univ. of Athens)*; Toutouzas, Kostas *(Medical School, Univ. of Athens)*; Tousoulis, Dimitris *(Medical School, Univ. of Athens)*; Michalis, Lampros *(Univ. of Ioannina)*; Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

16:32-16:34      WeCT2-02.12
**Characterization of Dental Pathologies using Digital Panoramic X-Ray Images based on Texture Analysis**
K, Veena Divya* *(R.V. College of Engineering, Bengaluru)*; Jatti, Dr.Anand *(RVCE, Bengaluru)*; Joshi, Revan *(D.A. Pandu Memorial R.V. Dental College and Hospital,)*; Krishna.S, Dr.Deepu *(Appolo Hospital, Bengaluru)*

## WeCT3-01: 16:10-17:10      Park Room
### Image Classification and Feature Extraction I (Poster Session)

16:10-16:12      WeCT3-01.1
**Glaucoma Classification from Retina Optical Coherence Tomography Angiogram**
Ong, Ee Ping* *(Inst. for Infocomm Research)*; Cheng, Jun *(Inst. for Infocomm Research, AStar)*; Wong, Damon *(Inst. for Infocomm Research)*; Liu, Jiang *(Ningbo Inst. of Materials Technology and Engineering, Chinese)*; Tay, Elton L.T. *(Tan Tock Seng Hospital)*; Yip, Leonard W.L. *(Tan Tock Seng Hospital)*

16:12-16:14      WeCT3-01.2
**Analyzing Orientation Patterns of Human Skin Fibroblasts using Image Gradient Information**
Bashar, Khayrul* *(Ochanomizu University)*; Hashimoto, Kei *(Program for Leading Graduate School, Graduate School of Humaniti)*; Gotoh, Mari *(Endowed Research Division of Human Welfare Sciences)*; Kori, Hiroshi *(Program for Leading Graduate School, Dept. of Information S)*

16:14-16:16      WeCT3-01.3
**Hair and Bare Skin Discrimination for Laser-Assisted Hair Removal Systems**
Cayir, Sercan* *(TOBB ETÜ)*; Yetik, Imam Samil *(TOBB University of Economics and Technology)*

**16:16-16:18** WeCT3-01.4

**Fully Automated Detection of Lamina Cribrosa in Optical Coherence Tomography: Framework and Illustrative Examples**

Syga, Piotr* *(Faculty of Fundamental Problems of Technology, Wrocław Univ)*; Sielużycki, Cezary *(Faculty of Fundamental Problems of Technology, Wrocław Univ)*; Krzyżanowska-Berkowska, Patrycja *(Ophthalmology Clinic, Wrocław Medical Univ.)*; Iskander, D Robert *(Wroclaw Univ. of Technology)*

**16:18-16:20** WeCT3-01.5

**Stability Assessment of Radiomic Features Computed on ADC Maps in Soft-Tissue Sarcoma**

Bologna, Marco* *(Politecnico di Milano)*; Montin, Eros *(Politecnico di Milano)*; Corino, Valentina *(Politecnico di Milano)*; Mainardi, Luca *(Politecnico di Milano)*

**16:20-16:22** WeCT3-01.6

**A mRMRMSRC Feature Selection Method for Radiomics Approach**

Liu, Tongtong *(Fudan University)*; Wu, Guoqing *(Fudan University)*; Yu, Jinhua* *(Fudan University)*; Guo, Yi *(Fudan University)*; Wang, Yuanyuan *(Fudan University)*; Shi, Zhifeng *(Huanshan Hospital)*; Chen, Liang *(Huanshan Hospital)*

**16:22-16:24** WeCT3-01.7

**Application of MRI Texture Analysis in the Study of the Posterior Fossa Tumors Growing Trend in Children**

Li, Mengmeng* *(Zhengzhou Univ.)*; Shang, Zhigang *(Zhengzhou Univ.)*; Dong, Yonghui *(Zhengzhou Univ.)*; Zhang, Yong *(The First Affiliated Hospital of Zhengzhou Univ.)*; Li, Ya *(The First Affiliated Hospital of Zhengzhou Univ.)*

**16:24-16:26** WeCT3-01.8

**Preoperative Parathyroid Localization using Joint Planar Imaging**

Srikram, Richalannaphat *(Faculty of Engineering, Chulalongkorn University)*; Jarumaneeroj, Pisit *(Chulalongkorn University)*; Chaiwatanarat, Tawatchai *(Faculty of Medicine, Chulalongkorn University)*; Rakvongthai, Yothin* *(Faculty of Medicine, Chulalongkorn University)*

**16:26-16:28** WeCT3-01.9

**Fully Automated Blink Detection for Uveal Melanoma Radiotherapy**

Cavusculu, Melih Ege* *(TOBB ETÜ)*; Yetik, Imam Samil *(TOBB University of Economics and Technology)*; Yeginer, Mete *(Hacettepe University)*

| WeCT3-02: 16:10-17:10 | Park Room |
|---|---|
| **Image Segmentation II** (Poster Session) | |

**16:10-16:12** WeCT3-02.1

**Automated Ovarian Follicular Monitoring: A Novel Real-Time Approach**

Faghih, Rose T.* *(University of Houston)*; Styer, Aaron *(Harvard Medical School)*; Brown, Emery N *(MGH-Harvard Medical School-MIT)*

**16:12-16:14** WeCT3-02.2

**An Embedded System for Image Segmentation and Multimodal Registration in Noninvasive Skin Cancer Screening**

Diaz, Silvana *(University of Concepcion)*; Soto, Javier E. *(Universidad de Concepción)*; Inostroza, Fabián *(Universidad de Concepción)*; Godoy, Sebastián E. *(Universidad de Concepción)*; Figueroa, Miguel* *(Universidad de Concepcion)*

**16:14-16:16** WeCT3-02.3

**Automated Lesion Segmentation and Dermoscopic Feature Segmentation for Skin Cancer Analysis**

Pezhman Pour, Mansoureh *(Northumbria University)*; Seker, Huseyin* *(The University of Northumbria at Newcastle)*; Shao, Ling *(University of East Anglia)*

**16:16-16:18** WeCT3-02.4

**Robust MR Image Segmentation using the Trimmed Likelihood Estimator in Asymmetric Student's-T Mixture Model**

Zhou, Yi *(East China Univ. of Science and Technology)*; Zhu, Hongqing* *(East China Univ. of Science and Technology)*; Tao, Xuan *(East China Univ. of Science and Technology)*

**16:18-16:20** WeCT3-02.5

**Semi-Automated Enhanced Breast Tumor Segmentation for CT Image**

Wang, Chao *(Harbin University of Science and Technology)*; Li, Meng *(Southeast University)*; Liu, Xia *(Harbin University of Science and Technology)*; Liu, Zaiyi *(Dept. of Radiology, Guangdong General Hospital, Guangdong A)*; Zang, Yali *(Institute of Automation, Chinese Academy of Sciences)*; Liu, Zhenyu *(Institute of Automation, Chinese Academy of Sciences)*; Dong, Di *(Chinese Academy of Sciences)*; Liang, changhong *(Guangdong Provincial People's Hospital)*; Tian, Jie* *(Chinese Academy of Sciences)*

**16:20-16:22** WeCT3-02.6

**Cardiac Image Segmentation using Generalized Polynomial Chaos Expansion and Level Set Function**

Du, Dongping* *(Texas Tech University)*; Du, Yuncheng *(Clarkson University)*

**16:22-16:24** WeCT3-02.7

**Using Cystoscopy to Segment Bladder Tumors with a Multivariate Approach in Different Color Spaces**

Freitas, Nuno Renato* *(University of Minho)*; Vieira, Pedro Miguel *(University of Minho)*; Brandao Lima, Verissimo *(Universidade do Minho)*; Lima, Estêvão *(ICVS/3Bs)*; Lima, Carlos Manuel Gregorio Santos *(University of Minho)*

| WeCT3-03: 16:10-17:10 | Park Room |
|---|---|
| **Machine Learning in Imaging III** (Poster Session) | |

**16:10-16:12** WeCT3-03.1

**Retinal Hemorrhage Detection by Rule-Based and Machine Learning Approach**

Xiao, Di* *(Commonwealth Scientific and Industrial Research Organization)*; Yu, Shuang *(Commonwealth Scientific and Industrial Research Organization)*; Vignarajan, Janardhan *(CSIRO)*; An, Dong *(Lions Eye institute)*; Tay-Kearney, Mei-Ling *(Royal Perth Hospital)*; Kanagasingam, Yogi *(The Australian eHealth Research Centre, Perth, CSIRO.)*

**16:12-16:14** WeCT3-03.2

**Image Quality Classification for DR Screening using Deep Learning**

Yu, FengLi* *(Nanjing University of Aeronautics and Astronautics)*; Sun, Jing *(Nanjing University of Aeronautics and Astronautics)*; Li, Annan *(Institute for Infocomm Research, ASTAR)*; Cheng, Jun *(Institute for Infocomm Research, AStar)*; Wan, Cheng *(Nanjing University of Aeronautics and Astronautics)*; Liu, Jiang *(Ningbo Institute of Materials Technology and Engineering, Chinese)*

**16:14-16:16** WeCT3-03.3

**Deep Convolutional Neural Networks for Left Ventricle Segmentation**

Horan, Kelsey *(The Graduate Center, CUNY)*; Molaei, Somayeh* *(Univ. of Michigan)*; Najarian, Kayvan *(Univ. of Michigan - Ann Arbor)*; Nallamothu, Brahmajee *(Univ. of Michigan)*; Kahrobaei, Delaram *(The Graduate Center, CUNY)*; Ebrahim Shiri, Mohammad *(Amirkabir Univ. of Technology)*

**16:16-16:18** WeCT3-03.4

**Deep Leaning based Nucleus Classification in Pancreas Histological Images**

Chang, Young Hwan* *(Oregon Health and Science Univ.)*; Thibault, Guillaume *(Oregon Health & Science Univ.)*; Madin, Owen *(Oregon Health and Science Univ.)*; Azimi, Vahid *(Oregon Health and Science Univ.)*; Meyers, Cole *(Oregon Health and Science Univ.)*; Johnson, Brett *(Oregon Health and Science Univ.)*; Link, Jason *(Oregon Health and Science Univ.)*; Margolin, Adam *(Oregon Health and Science Univ.)*; Gray, Joe *(Oregon Health & Science Univ.)*

**16:18-16:20** WeCT3-03.5

**Deep Tessellated Retinal Image Detection with Convolutional Neural Networks**

Lyu, Xingzheng* *(Zhejiang Univ.)*; Li, Hai *(Zhejiang Univ.)*; Zhen, Yi *(Ophthalmic Disease Intelligent Diagnosis Joint Lab of Sha)*; Ji, Xin *(Beijing Shanggong Medical Technology Co., Ltd., Beijing, China)*; Zhang, Sanyuan *(Zhejiang Univ.)*

16:20-16:22 WeCT3-03.6

**Development of Automatic Retinal Vessel Segmentation Method in Fundus Images via Convolutional Neural Networks**
Song, Joonyoung* *(Gwangju Institute of Science and Technology (GIST))*; Lee, Boreom *(Gwangju Institute of Science and Technology (GIST))*

16:22-16:24 WeCT3-03.7

**Iterative Deep Convolutional Encoder-Decoder Network for Medical Image Segmentation**
Kim, Jung Uk* *(Korea Advanced Institute of Science and Technology (KAIST))*; Kim, Hak Gu *(Korea Advanced Institute of Science and Technology (KAIST))*; Ro, Yong Man *(Korea Advanced Institute of Science and Technology)*

16:24-16:26 WeCT3-03.8

**Ensemble of Convolutional Neural Networks for Classification of Breast Microcalcification from Mammograms**
Sert, Egemen *(Middle East Technical Univ.)*; Ertekin, Seyda *(Middle East Technical Univ., Massachusetts Institute of Tec)*; Halici, Ugur* *(Middle East Technical Univ.)*

| WeCT4-01: 16:10-17:10 | Min Room |
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**Body Area Network Communication I** (Poster Session)

16:10-16:12 WeCT4-01.1

**Comparison of Impedance Cardiogram with Continuous Wave Radar using Body-Contact Antennas**
Buxi, Dilpreet *(Monash University)*; Dugar, Rahul *(Monash University)*; Redouté, Jean-Michel *(Monash University)*; Yuce, Mehmet* *(Monash University)*

16:12-16:14 WeCT4-01.2

**A MAC Protocol with High Scalability for Motion Capture based on Frequency Division Multiple and Time Division Multiple Access**
Zhao, Guoru* *(Shenzhen Institutes of Advanced Technology Chinese Academy of Sci)*; Li, Jie *(Wuhan University of Technology)*; Liang, Shengyun *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Yongfeng, Wang *(School of Mechanical Engineering. Hebei University of Technology)*; Ma, Yingnan *(Beijing Research Center of Urban System Engineering)*; Gao, Xing *(Beijing Research Center of Urban System Engineering)*

16:14-16:16 WeCT4-01.3

**Modeling and Characterization of Different Channels based on Human Body Communication**
Li, Jingzhen *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Nie, Zedong* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Liu, Yuhang *(Shenzhen Institute of Advanced Technology)*; Wang, Lei *(Shenzhen Institutes of Advanced Technology)*

| WeCT4-02: 16:10-17:10 | Min Room |
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**Integrated Implantable Sensors I** (Poster Session)

16:10-16:12 WeCT4-02.1

**Reever Control: A Biosignal Controlled Interface**
Cene, Vinicius H. *(UFRGS)*; Favieiro, Gabriela Winkler* *(Federal University of Rio Grande do Sul (UFRGS))*; Nedel, Luciana *(UFRGS)*; Balbinot, Alexandre *(Federal University of Rio Grande do Sul (UFRGS))*

16:12-16:14 WeCT4-02.2

**A 274µ W Clock Synchronized Wireless Body Area Network IC with Super-Regenerative RSSI for Biomedical Ad-Hoc Network System**
Lee, Yongsu* *(KAIST)*; Yoo, Hoi-Jun *(KAIST)*

16:14-16:16 WeCT4-02.3

**A Wearable Multi-Pad Electrode Prototype for Selective Functional Electrical Stimulation of Upper Extremities**
Wang, Haipeng *(Southeast University, Institute of RF- & OE-ICs)*; Guo, Aiwen *(Southeast University)*; Bi, Zhengyang *(Southeast Southeast University, State Key Lab of Bioelectronics)*; Li, Fei *(Southeast University)*; Lü, Xiaoying *(Southeast University)*; Wang, Zhigong* *(Southeast University)*

16:16-16:18 WeCT4-02.4

**A Quad-Cantilevered Plate Micro-Sensor for Intracranial Pressure Measurement**
Lalkov, Vasko *(New York University Abu Dhabi)*; Qasaimeh, Mohammad* *(Division of Engineering, New York University Abu Dhabi (NYUAD))*

16:18-16:20 WeCT4-02.5

**A Sub 125 nW Sub-Threshold Analog Adaptive Sampler in 180 nm CMOS**
Laurenson, Callum* *(Monash Univ.)*; Yuce, Mehmet *(Monash Univ.)*; Redouté, Jean-Michel *(Monash Univ.)*

| WeCT4-03: 16:10-17:10 | Min Room |
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**Optical and Photonic Systems I** (Poster Session)

16:10-16:12 WeCT4-03.1

**A Novel Hardware Implementation for Detecting Respiration Rate using Photoplethysmography**
Prinable, Joseph Barry Yoo Sik* *(University of Sydney)*; Jones, Peter *(The University of Sydney)*; Thamrin, Cindy *(Woolcock Institute of Medical Research, University of Sydney)*; McEwan, Alistair *(The University of Sydney)*

16:12-16:14 WeCT4-03.2

**A Video/IMU Hybrid System for Movement Estimation in Infants**
Machireddy, Archana* *(Oregon Health and Science Univ.)*; Van Santen, Jan *(Oregon Health and Science Univ.)*; Wilson, Jenny *(Oregon Health & Science Univ.)*; Myers, Julianne *(Oregon Health & Science Univ.)*; Hadders-Algra, Mijna *(Univ. of Groningen)*; Song, Xubo *(Oregon Health & Science Univ.)*

16:14-16:16 WeCT4-03.3

**Running Wavelet Archetype Aids the Determination of Heart Rate from the Video Photoplethysmogram during Motion**
Addison, Paul* *(Medtronic)*; Foo, David Ming Hui *(Medtronic)*; Jacquel, Dominique *(Medtronic)*

16:16-16:18 WeCT4-03.4

**Using a New PPG Indicator to Increase the Accuracy of PTT-Based Continuous Cuffless Blood Pressure Estimation**
Lin, Wan-Hua *(Shenzhen Institutes of Advanced Technology)*; Wang, Hui *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Samuel, Oluwarotimi Williams *(Shenzhen Institutes of Advanced Technology)*; Li, Guanglin* *(Shenzhen Institutes of Advanced Technology)*

16:18-16:20 WeCT4-03.5

**Predicting Food Nutrition Facts using Pocket-Size Near-Infrared Sensor**
Thong, Yoke Jia *(Australia E-health research centre CSIRO)*; Nguyen, Thuong *(CSIRO)*; Zhang, Qing* *(CSIRO)*; Karunanithi, M. *(CSIRO Digital Productivity Flagship)*; Yu, L. *(Shanxi Univ.)*

| WeCT4-04: 16:10-17:10 | Min Room |
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**Physiological Modeling and Analysis I** (Poster Session)

16:10-16:12 WeCT4-04.1

**Affordable Sensor based Gaze Tracking for Realistic Psychological Assessment**
Gavas, Rahul *(TCS Research and Innovation, Tata Consultancy Services Ltd.)*; Roy, Sangheeta *(TCS Research and Innovations, Tata Consultancy Services Ltd.)*; Chatterjee, Debatri *(TCS Innovation Lab)*; Tripathy, Soumya Ranjan *(TCS Research and Innovation, Tata Consultancy Services Ltd.)*; Chakravarty, Kingshuk *(Tata Consultancy Services Ltd.)*; Sinha, Aniruddha* *(Tata Consultancy Services Ltd.)*; Lahiri, Uttama *(Indian Institute of Technology, Gandhinagar)*

16:12-16:14 WeCT4-04.2

**Towards Precise Tracking of Electric-Mechanical Cardiac Time Intervals through Joint ECG and BCG Sensing and Signal Processing**
Zhang, Haihong* *(Institute for Infocomm Research)*; Zimin, Wang *(Guilin Univ. of Electronic Tech.)*; Dong, Kejun *(Nanyang Technological Univ.)*; Lin, Zhiping *(Nanyang Technological Univ.)*; Ng, Soon Huat *(Institute for Infocomm Research)*

**16:14-16:16**  WeCT4-04.3
**Ambulatory Gastric Mucosal Slow Wave Recording for Chronic Experimental Studies**
Paskaranandavidel, Niranchan* *(The University of Auckland)*; Angeli, Timothy Robert *(Auckland Bioengineering Institute, University of Auckland)*; Stocker, Abigail *(University of Louisville Hospital)*; Mcelmurray, Lindsay *(University of Louisville Hospital)*; O'Grady, Gregory *(University of Auckland)*; Abell, Thomas *(The Division of Digestive Diseases, University of Mississippi Me)*; Cheng, Leo K *(The University of Auckland)*

**16:16-16:18**  WeCT4-04.4
**Ex Vivo Animal-Model Assessment of a Non-Invasive System for Loss of Resistance Detection during Epidural Blockade**
Carassiti, Massimiliano *(University Campus Bio-Medico of Rome)*; Quarta, Rossella *(Università Campus Bio-Medico di Roma, Rome-Italy)*; Mattei, Alessia *(Università Bampus Bio-Medico di Roma)*; Tesei, Marco *(Università Campus Bio-Medico di Roma)*; Saccomandi, Paola* *(University Campus Bio-Medico of Rome)*; Massaroni, Carlo *(Università Campus Bio-Medico di Roma)*; Setola, Roberto *(Univ. Campus Bio-Medico)*; Schena, Emiliano *(University of Rome Campus Bio-Medico)*

**16:18-16:20**  WeCT4-04.5
**Overnight Non-Contact Continuous Vital Signs Monitoring using an Intelligent Automatic Beam-Steering Doppler Sensor at 2.4 GHz**
Batchu, Sandeep *(Texas Tech Univ.)*; Narasimhachar, Harikrishna *(Texas Tech Univ.)*; Hall, Travis *(Texas Tech Univ.)*; Lopez, Jerry *(Texas Tech Univ.)*; Nguyen, Tam *(Texas Tech Univ. Health Sciences Center)*; Banister, Ron *(Texas Tech Univ. Health Center)*; Lie, Donald Yu-Chun* *(Texas Tech Univ.)*

**16:20-16:22**  WeCT4-04.6
**Permanency Analysis on Human Electroencephalogram Signals for Pervasive Brain-Computer Interface Systems**
Sadeghi, Koosha *(Arizona State University)*; Lee, Junghyo* *(Arizona State University)*; Banerjee, Ayan *(Computer Science)*; Sohankar, Javad *(Arizona State University)*; Gupta, Sandeep K. S. *(Arizona State University)*

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**WeCT4-05:  16:10-17:10**  Min Room
**Power Efficient BSN I** (Poster Session)

**16:10-16:12**  WeCT4-05.1
**Energy Efficient LoRa GPS Tracker for Dementia Patients**
Hadwen, Timothy Ryan *(Australian eHealth Research Centre)*; Smallbon, Vanessa Jane *(CSIRO AEHRC)*; Zhang, Qing* *(CSIRO)*; D'Souza, Matthew *(The University of Queensland)*

**16:12-16:14**  WeCT4-05.2
**Charge Pumping with Finger Capacitance for Body Sensor Energy Harvesting**
Zhou, Alyssa* *(University of California, Berkeley)*; Maharbiz, Michel *(University of California, Berkeley)*

**16:14-16:16**  WeCT4-05.3
**Polypyrrole RVC Biofuel Cells for Powering Medical Implants**
Roxby, Daniel Ninio* *(University of Technology, Sydney)*; Ting, Simon *(University of Technology Sydney)*; Nguyen, Hung T. *(University of Technology, Sydney)*

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**WeCT5-01:  16:10-17:10**  Lee Room
**Clinical Applications of Sensing Technology I** (Poster Session)

**16:10-16:12**  WeCT5-01.1
**Development of a Wearable Support System to Aid the Visually Impaired in Independent Mobilization and Navigation**
Froneman, Tayla *(Stellenbosch Univ.)*; Van Den Heever, Dawie *(Stellenbosch Univ.)*; Dellimore, Kiran* *(Philips Research)*

**16:12-16:14**  WeCT5-01.2
**Application of Infrared Scanning of the Neck Muscles to Control a Cursor in Human-Computer Interface**
Safavi, Seyedemahya *(University of California Irvine)*; Sundaram, Subramanian Meenakshi *(University of California, Irvine)*; Gorji, ALi Heydari *(University of California, Irvine)*; Udaiwal, Neha Satishkumar *(University of California, Irvine)*; Chou, Pai H.* *(University of California, Irvine)*

**16:14-16:16**  WeCT5-01.3
**An MRI-Compatible Force Sensor for Measuring Differential Isometric Precision Grip Force**
Han, Chungmin* *(University of Texas at Austin)*; Oblak, Ethan *(University of Texas at Austin)*; Abraham, Lawrence *(University of Texas at Austin)*; Ferrari, Paul *(University of Texas at Austin)*; McManis, Mark *(Dell Children's Medical Center of Central Texas)*; Schnyer, David *(University of Texas, Austin)*; Sulzer, James *(University of Texas at Austin)*

**16:16-16:18**  WeCT5-01.4
**Using Point Cloud Data to Improve Three Dimensional Gaze Estimation**
Wang, Haofei* *(Hong Kong University of Science and Technology)*; Antonelli, Marco *(Hong Kong University of Science and Technology)*; Shi, Bertram E *(Hong Kong University of Science and Technology)*

**16:18-16:20**  WeCT5-01.5
**An Efficient Color Correction Method for Smartphone Camera-Based Health Monitoring Applications**
Dang, Duc* *(Texas Tech University)*; Cho, Chae Ho *(Texas Tech University)*; Kim, Daeik *(Chonnam National University)*; Kwon, Oh Seok *(Korea Research Institute of Bioscience and Biotechnology)*; Chong, Jo Woon *(Texas Tech University)*

**16:20-16:22**  WeCT5-01.6
**Quantification Assessment of Bradykinesia in Parkinson's Disease based on a Wearable Device**
Lin, Zhirong *(Quanzhou Institute of Equipment Manufacturing, Haixi Institutes,)*; Dai, Houde* *(Quanzhou Institute of Equipment Manufacturing, Haixi Institutes,)*; Xiong, Yongsheng *(Quanzhou Institute of Equipment Manufacturing, Haixi Institutes,)*; Xia, Xuke *(Quanzhou Institute of Equipment Manufacturing, Haixi Institutes,)*; Horng, Shi-Jinn *(National Taiwan University of Science and Technology)*

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**WeCT5-02:  16:10-17:10**  Lee Room
**Novel Physiological Monitoring Methods I** (Poster Session)

**16:10-16:12**  WeCT5-02.1
**Recovery of Forearm Occluded Trajectory in Kinect using a Wrist-Mounted Inertial Measurement Unit**
Jatesiktat, Prayook* *(NTU)*; Ang, Wei Tech *(Nanyang Technological University)*

**16:12-16:14**  WeCT5-02.2
**Effect of Electrode Material on the Sensitivity of Interdigitated Electrodes used for Electrical Cell-Substrate Impedance Sensing Technology**
Martinez Santamaria, Jaime Andres* *(Institut des Nanotechnologies de Lyon)*; Montalibet, Amalric *(INL UMR-5270 - INSA Lyon)*; McAdams, Eric *(INSA Lyon)*; Faivre, Magalie *(Institut des Nanotechnologies de Lyon)*; Ferrigno, Rosaria *(Université Claude Bernard Lyon 1)*

**16:14-16:16**  WeCT5-02.3
**The SPLENDID Chewing Detection Challenge**
Papapanagiotou, Vasileios *(Aristotle University of Thessaloniki)*; Diou, Christos* *(Aristotle University of Thessaloniki)*; Zhou, Lingchuan *(CSEM SA)*; van den Boer, Janet *(Wageningen University)*; Mars, Monica *(Wageningen University)*; Delopoulos, Anastasios *(Aristotle University of Thessaloniki)*

**16:16-16:18**  WeCT5-02.4
**Wireless Chest Wearable Vital Sign Monitoring Platform for Hypertension**
Janjua, Ghalib Muhammad Waqas* *(Ulster University)*; Guldenring, Daniel *(University of Ulster)*; Finlay, Dewar *(University of Ulster)*; McLaughlin, James *(University of Ulster)*

**16:18-16:20**  WeCT5-02.5
**Performance of Compressive Sensing for the Reconstruction of Different QRS Pulses in ECG Signals**
Pant, Jeevan Kumar *(Ryerson University)*; Krishnan, Sridhar* *(Ryerson University)*

**WeCT5-03:** 16:10-17:10      Lee Room
**Sensing Methods and Systems I** (Poster Session)

16:10-16:12      WeCT5-03.1
**Respiratory Rate Measurements via Doppler Radar for Health Monitoring Applications**
Alemaryeen, Ala *(Univ. of North Dakota)*; Noghanian, Sima *(Univ. of North Dakota)*; Fazel-Rezai, Reza\* *(Univ. of North Dakota)*

16:12-16:14      WeCT5-03.2
**Development of Wearable Muscle Fatigue Detection System using Capacitance Coupling Electrodes**
Kobayashi, Takahiro\* *(Kindai University)*; Okada, Shima *(Faculty of Science and Engineering, Kinki University)*; Makikawa, Masaaki *(Ritsumeikan University)*; Shiozawa, Naruhiro *(Ritsumeikan University)*; Kosaka, Manabu *(Kindai Univ.)*

16:14-16:16      WeCT5-03.3
**A Tracking Algorithm for Cell Motility Assays in CMOS Systems**
Martinez-Gomez, Cristina *(Instituto de Microelectrónica de Sevilla / Universidad de Sevill)*; Olmo, Alberto *(Universidad de Sevilla)*; Huertas, Gloria *(Instituto de Microelectronica de Sevilla / Universidad de Sevill)*; Perez, Pablo *(Instituto de Microelecctronica de Sevilla / Universidad de Sevil)*; Andres, Maldonado-Jacobi *(Instituto de Microelectronica de Sevilla / Universidad de Sevill)*; Yufera, Alberto\* *(University of Seville)*

16:16-16:18      WeCT5-03.4
**Proof of Concept Laplacian Estimate Derived for Noninvasive Tripolar Concentric Ring Electrode with Incorporated Radius of the Central Disc and the Widths of the Concentric Rings**
Makeyev, Oleksandr *(Diné College)*; Lee, Colin *(Diné College)*; Besio, W. G.\* *(University of Rhode Island)*

**WeCT5-04:** 16:10-17:10      Lee Room
**Sensor Systems I** (Poster Session)

16:10-16:12      WeCT5-04.1
**Non-Invasive Sensor based Automated Smoking Activity Detection**
Bhandari, Babin *(Deakin Univ.)*; Lu, JianChao *(Deakin Univ.)*; Zheng, Xi *(Deakin Univ.)*; Rajasegarar, Sutharshan\* *(Deakin Univ.)*; Karmakar, Chandan *(Deakin Univ.)*

16:12-16:14      WeCT5-04.2
**Rich Context Information for Just-in-Time Adaptive Intervention Promoting Physical Activity**
Cruciani, Federico\* *(Ulster University)*; Nugent, Chris *(University of Ulster)*; Cleland, Ian *(University of Ulster)*; McCullagh, Paul *(University of Ulster)*

16:14-16:16      WeCT5-04.3
**Home-Based Upper Extremity Rehabilitation Support using a Contactless Ultrasonic Sensor**
Griffith, Henry\* *(Michigan State University)*; Biswas, Subir *(Michigan State University)*

16:16-16:18      WeCT5-04.4
**MuSeSe – A Multisensor Armchair for Unobtrusive Vital Sign Estimation and Motion Artifact Analysis**
Hoog Antink, Christoph\* *(RWTH Aachen University, Aachen, Germany)*; Leonhardt, Steffen *(RWTH Aachen University)*; Schulz, Florian *(RWTH Aachen University)*; Walter, Marian *(RWTH Aachen University)*

16:18-16:20      WeCT5-04.5
**A Low-Power High-Sensitivity Analog Front-End for PPG Sensor**
Lin, Binghui *(Shanghai Jiao Tong University)*; Mohamed, Atef *(Shanghai Jiao Tong University)*; Wang, Guoxing\* *(Shanghai Jiao Tong University)*

16:20-16:22      WeCT5-04.6
**Ultrasonic Thermal Dust: A Method to Monitor Deep Tissue Temperature Profiles**
Ozilgen, Burak Arda\* *(University of California Berkeley)*; Maharbiz, Michel *(University of California, Berkeley)*

16:22-16:24      WeCT5-04.7
**A ROIC for Mn(TPP)Cl-DOP-THF-Polyhema PVC Membrane Modified N-Channel Si3N4 ISFET Sensitive to Histamine**
Samah, N. L. M. A. *(Universiti Teknologi MARA)*; Lee, Khuan Y.\* *(Universiti Teknologi MARA)*; Sulaiman, S.A. *(Universiti Teknologi MARA)*; Jarmin, R *(Universiti Teknologi MARA)*

16:24-16:26      WeCT5-04.8
**Novel Carbon Fiber Probe for Temperature Monitoring during Thermal Therapies**
Saccomandi, Paola\* *(Univ. Campus Bio-Medico of Rome)*; Schena, Emiliano *(Univ. of Rome Campus Bio-Medico)*; Caponero, Michele Arturo *(ENEA - Centro Ricerche Frascati)*; Gassino, Riccardo *(Dept. of Electronics & Telecommunications, Politecnico di)*; Hernandez, Juan *(IHU-Strasbourg)*; Perrone, Guido *(Dept. of Electronics & Telecommunications, Politecnico di)*; Vallan, Alberto *(Dept. of Electronics & Telecommunications, Politecnico di)*; Diana, Michele *(IRCAD: Research Institute against Cancer of Digestive System, St)*; Costamagna, Guido *(Unit of Digestive Endoscopy, Univ. Cattolica del Sacro Cuor)*; Marescaux, Jacques *(IRCAD)*

16:26-16:28      WeCT5-04.9
**Pulse Oximetry in the Neck – A Proof of Concept**
Peng, M.\* *(Imperial College London)*; Imtiaz, S.A. *(Imperial College London)*; Rodriguez-Villegas, E. *(Imperial College London)*

16:28-16:30      WeCT5-04.10
**Temperature Influence on the Response at Low Airflow of a Variable Orifice Flowmeter**
Massaroni, Carlo *(Università Campus Bio-Medico di Roma)*; Schena, Emiliano\* *(University of Rome Campus Bio-Medico)*; Silvestri, Sergio *(Università Campus Bio-Medico di Roma)*

**WeCT6-01:** 16:10-17:10      Zworykin Room
**Biomaterials and Patterning II** (Poster Session)

16:10-16:12      WeCT6-01.1
**Functionalized Electromagnetic Actuation Method for Aggregated Nanoparticles Steering**
Kafash hoshiar, Ali *(Gyeongsang National Univ.)*; Anh Le, Tuan *(Gyeongsang National Univ.)*; Ul Amin, Faiz *(Gyeongsang National Univ.)*; Kim, Myeong Ok *(Gyeongsang National Univ.)*; Yoon, Jungwon\* *(Gyeongsang National Univ.)*

**WeCT6-02:** 16:10-17:10      Zworykin Room
**Cell and Protein Interaction with External Fields II** (Poster Session)

16:10-16:12      WeCT6-02.1
**Dynamic Electromechanical Control of Biomolecules using a Nano Virtual Cathode Display**
Miyazako, Hiroki\* *(The Univ. of Tokyo)*; Mabuchi, Kunihiko *(The Univ. of Tokyo)*; Hoshino, Takayuki *(Univ. of Tokyo)*

**WeCT6-03:** 16:10-17:10      Zworykin Room
**Micro- and Nano-Sensors** (Poster Session)

16:10-16:12      WeCT6-03.1
**Rapid Prototyping of Microscale and Flexible Electrochemical Biosensors using Direct Write**
Nguyen, Tran *(Purdue University - Biomedical Engineering)*; Lam, Stephanie *(Purdue University)*; Shi, Riyi *(Purdue University)*; Lee, Hyowon\* *(Purdue University)*

16:12-16:14      WeCT6-03.2
**Strain Gauge Integrated Implantable Magnetic Microactuators**
Yang, Qi *(Purdue University)*; Lee, Hyowon\* *(Purdue University)*

16:14-16:16      WeCT6-03.3
**Evaluation of Printed Microsensors for Microphysiometry**
Feil, Michael *(University of Applied Sciences Munich)*; Wiest, Joachim\* *(cellasys GmbH)*

16:16-16:18      WeCT6-03.4
**Analysis of Cellular Dielectric Properties Enhanced by Iron Oxide Nanoparticles within a Dielectrophoresis Device**
Oh, Eun Seol *(Univ.)*; Park, Insoo *(Yonsei Univ., Dept. of Biomedical Engineering)*; Ko, Kwan Hwi *(Yonsei Univ.)*; Lee, Sang Woo *(Yonsei Univ.)*; Key, Jaehong\* *(Yonsei Univ.)*

**16:18-16:20**                                           WeCT6-03.5
**Top-Down Fabrication of Arrayed Silicon Nanowire using (111)-Silicon Substrate**
Lee, Sangmin* *(Kyung Hee University)*;
Choi, Yeok In *(Kyung Hee University)*

**16:20-16:22**                                           WeCT6-03.6
**Lung Cancer Cell Volatile Organic Compounds (VOCs) Detection via Surface Enhanced Raman Spectroscopy**
Shim, On *(Korea University)*; Choi, Yeonho* *(Korea University)*;
Quan, Yu Hua *(Dept. of Thoracic and Cardiovascular Surgery, Korea University)*; Kim, Hyun Koo *(Dept. of BioMedical Sciences, College of Medicine, Korea Univ)*

**16:22-16:24**                                           WeCT6-03.7
**Classification of Exosome by Surface Enhanced Raman Spectroscopy (SERS) and Principal Component Analysis (PCA)**
Park, Jaena *(Korea University)*; Shin, Hyunku *(Korea University)*; Choi, Byeong Hyeon *(Dept. of BioMedical Sciences, College of Medicine, Korea Univ.)*; Jeong, Hyesun *(Korea University)*; Jung, Jik Han *(KAIST)*; Kim, Hyun Koo *(Dept. of BioMedical Sciences, College of Medicine, Korea Univ.)*; Hong, Sunghoi *(Korea University)*; Park, Ji Ho *(KAIST)*; Choi, Yeonho* *(Korea University)*

**WeCT6-04:** 16:10-17:10                      Zworykin Room
**Microfluidic Applications** (Poster Session)

**16:10-16:12**                                           WeCT6-04.1
**In Vitro 3D Model of Mammary Duct based Microfluidic System**
Cho, Youngkyu* *(Korea Univ.)*; Chung, Seok *(Korea Univ.)*

**16:12-16:14**                                           WeCT6-04.2
**Development of a 3D in Vitro Innervated Skin Model on a Microfluidic Chip**
Ohk, Kyungeun* *(Korea Univ.)*; Chung, Seok *(Korea Univ.)*

**16:14-16:16**                                           WeCT6-04.3
**Microfluidic Analysis Platform (MAP) for Leukocyte Extraction from Whole Blood**
Tan, Justin *(National University of Singapore)*;
Kim, Sangho* *(National University of Singapore)*

**16:16-16:18**                                           WeCT6-04.4
**Difference of Dielectrophoretic Response of Live Human Breast Cancer Cell in Various Frequency Sweep Rate**
Ko, Kwan Hwi *(Yonsei Univ.)*; Kim, Min-Hyung *(Yonsei Univ., Dept. of Biomedical Engineering)*; Park, Insoo *(Yonsei Univ., Dept. of Biomedical Engineering)*; Lim, Jongwon *(Yonsei Univ.)*; Lee, Sang Woo* *(Yonsei Univ.)*

**16:18-16:20**                                           WeCT6-04.5
**Controlled Detachment of Cells Cultured within a Microfluidic Chip for Re-Analysis**
Lee, SeungJin *(Sungkyunkwan University)*; Lim, Wanyoung *(Sungkyunkwan University)*; Park, Sungsu *(Sungkyunkwan University)*; Baac, Hyoung Won* *(Sungkyunkwan University)*

**16:20-16:22**                                           WeCT6-04.6
**Flat-Faced and Coded Microcapsules for Multiplexing Bioassays**
Jeong, Yunjin* *(Dept. of Electrical and Computer Engineering, Seoul National)*; Han, Haejun *(Celemics Inc., Seoul, Korea)*; Song, Younghoon *(Dept. of Electrical and Computer Engineering, Seoul National)*; Kwon, Sunghoon *(Dept. of Electrical and Computer Engineering, Seoul National)*

**16:22-16:24**                                           WeCT6-04.7
**Pancreatic Islet-on-a-Chip with Controlled Flow Condition for Long-Term Maintenance of Islet Characteristics**
Jun, Yesl* *(Korea Univ.)*; Lee, Sang Hoon *(College of Health science, Korea Univ.)*; Chung, Seok *(Korea Univ.)*

**WeCT6-05:** 16:10-17:10                      Zworykin Room
**Microfluidic Techniques, Methods and Systems** (Poster Session)

**16:10-16:12**                                           WeCT6-05.1
**A Microfluidic Device as a Tool for C. Elegans Nictation Study**
Choi, Junhee *(Seoul National University)*; Kim, Sungjong *(Seoul National University)*; Choi, Jin Woo *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*; Kim, Hee Chan *(Seoul National University)*; Lee, Junho *(Seoul National University)*

**16:12-16:14**                                           WeCT6-05.2
**High Pressure Nanofluidic Micropump based on Electrolysis**
Liang, Fupeng *(Southeast Univ.)*; Qiao, Yi *(Southeast Univ.)*; Ju, An *(Southeast Univ.)*; Li, Junji *(Southeast Univ.)*; Lu, Na *(Southeast Univ.)*; Tu, Jing *(Southeast Univ.)*; Lu, Zuhong* *(Southeast Univ.)*

**16:14-16:16**                                           WeCT6-05.3
**Quantitative Analysis of Chemical Release and Uptake in Cells-on-Paper Samples**
Trouillon, Raphaël* *(EPFL)*; Letizia, Maria Cristina *(EPFL)*; Gijs, Martin *(EPFL)*

**16:16-16:18**                                           WeCT6-05.4
**Characterization of the Trap Dielectrophoretic Force of Microspheres in a Microfluidic Device**
Choi, Seungyeop *(Younsei University)*; Park, Insoo *(Yonsei University, Dept. of Biomedical Engineering)*; Kim, Min-Hyung *(Yonsei University, Dept. of Biomedical Engineering)*; Lee, Sang Woo* *(Yonsei University)*

**16:18-16:20**                                           WeCT6-05.5
**Microchip-Based Single Cell Assay Platform to Evaluate Responses of Tumors to Therapeutic Combinations**
Choi, Jongchan *(GIST)*; Kim, Hanbyul *(GIST)*; Yang, Sung* *(Gwangju Institute of Science and Technology (GIST))*

**16:20-16:22**                                           WeCT6-05.6
**Rapid Scalable Fabrication of Micro/Nano Through-Hole Membrane**
Tahk, Dongha *(Seoul National University)*; Paik, Sang-Min *(Seoul National University)*; Lim, Jungeun *(Seoul National University)*; Bang, Seokyoung *(Seoul National University)*; Jeon, Noo Li* *(Seoul National University)*

**16:22-16:24**                                           WeCT6-05.7
**Tunable Herringbone Structure Device for Particle Focusing**
Hyun, Ji-chul *(GIST)*; Yang, Sung* *(Gwangju Institute of Science and Technology (GIST))*

**16:24-16:26**                                           WeCT6-05.8
**A Microengineered Human Cornea-on-a-Chip for Evaluating Ocular Drugs**
Kim, Jungkyu* *(Texas Tech Univ.)*; Estlack, Zachary *(Texas Tech Univ.)*; Bennet, Devasier *(Texas Tech Univ.)*

**WeCT7-01:** 16:10-17:10                       Herrick Room
**BioRobotics and Biomechanics I** (Poster Session)

**16:10-16:12**                                           WeCT7-01.1
**Development and Testing of a New Cognitive Technological Tool for Episodic Memory: A Feasibility Study**
Maselli, Martina* *(Scuola Superiore Sant'Anna)*; Fiorini, Laura *(Scuola Superiore Sant'Anna)*; Castro, Emanuela *(Scuola Superiore Sant'Anna)*; Baldoli, Ilaria *(Scuola Superiore Sant'Anna, the BioRobotics Institute)*; Tocchini, Stefania *(USL Nordovest Toscana)*; Timpano Sportiello, Marco *(USL Nordovest Toscana)*; Cavallo, Filippo *(Scuola Superiore Sant'Anna)*; Cecchi, Francesca *(Scuola Superiore Sant'Anna)*; Laschi, Cecilia *(Scuola Superiore Sant'Anna)*

**16:12-16:14** WeCT7-01.2

**Feasibility Study on the Assessment of Auditory Sustained Attention through Walking Motor Parameters in Mild Cognitive Impairments and Healthy Subjects**

Fiorini, Laura *(Scuola Superiore Sant'Anna)*; Maselli, Martina\* *(Scuola Superiore Sant'Anna)*; Castro, Emanuela *(Scuola Superiore Sant'Anna)*; Tocchini, Stefania *(USL Nordovest Toscana)*; Timpano Sportiello, Marco *(USL Nordovest Toscana)*; Laschi, Cecilia *(Scuola Superiore Sant'Anna)*; Cecchi, Francesca *(Scuola Superiore Sant'Anna)*; Cavallo, Filippo *(Scuola Superiore Sant'Anna)*

**16:14-16:16** WeCT7-01.3

**Modeling and Analysis of Individual with Lower Extremity Amputation Locomotion using Prosthetic Feet and Running-Specific Prostheses**

Murai, Akihiko\* *(National Institute of Advanced Industrial Science and Technology)*; Hobara, Hiroaki *(Japan Society for the Promotion of Science)*; Hashizume, Satoru *(National Institute of Advanced Industrial Science and Technology)*; Kobayashi, Yoshiyuki *(National Institute of Advanced Industrial Science and Technology)*; Tada, Mitsunori *(National Institute of Advanced Industrial Science and Technology)*

**16:16-16:18** WeCT7-01.4

**A Multimodal Interface to Resolve the Midas-Touch Problem in Gaze Controlled Wheelchair**

Meena, Yogesh Kumar\* *(Ulster University)*; Cecotti, Hubert *(University of Ulster)*; Wong-Lin, KongFatt *(University of Ulster)*; Prasad, Girijesh *(University of Ulster)*

**16:18-16:20** WeCT7-01.5

**Design, Implementation and Performance Validation of UOMPro Artificial Hand: Towards Affordable Hand Prostheses**

Manodara Acharige, Nisal *(University of Moratuwa)*; Ruhunage, Isuru\* *(University of Moratuwa)*; Wickramasinghe Siriwardhana, Janaka Subodha Madhuranga *(University of Moratuwa)*; Perera, Chamika Janith *(University of Moratuwa)*; Lalitharatne, Thilina Dulantha *(University of Moratuwa)*

**16:20-16:22** WeCT7-01.6

**Construction of a Soft Wearable Body Cooling System for Persons with Spinal Cord Injury**

Takashima, Atsushi\* *(National Rehabilitation Center for Persons with Disabilities)*; Sato, Kensuke *(Chiba Institute of Technology)*; Takizawa, Kenta *(Tokyo Institute of Technology, National Rehabilitation Center fo)*; Suzurikawa, Jun *(Research Institute of National Rehabilitation Center for Persons)*; Higuchi, Yukiharu *(National Rehabilitation Center for Persons with Disabilities)*; Huang, Ming *(Nara Institute of Science and Technology)*; Teshima, Yoshinori *(Chiba Institute of Technology)*; Tamura, Toshiyo *(Waseda University)*; Kurabayashi, Daisuke *(Tokyo Institute of Technology)*; Inoue, Takenobu *(Research Institute of National Rehabilitation Center for Persons)*; Ogata, Toru *(National Rehabilitation Center for Persons with Disabilities)*

**16:22-16:24** WeCT7-01.7

**Wireless Navigation of Pigeons using Polymer-Based Fully Implantable Stimulator: A Pilot Study using Depth Electrodes**

Seo, Jungmin\* *(Seoul National University)*; Choi, Gwang Jin *(Seoul National University)*; Park, Sangwan *(Seoul National University College of Veterinary Medicine)*; Lee, Jihun *(Brown University, school of Engineering)*; Baek, Changhoon *(Seoul National University)*; Jang, Jungwoo *(Seoul National University)*; Lim, Jaegook *(Seoul National University College of Veterinary Medicine)*; Shin, Soowon *(Seoul National University)*; Seo, Kangmoon *(Seoul National University College of Veterinary Medicine)*; Seo, Jong Mo *(Seoul National University, School of Engineering)*; Song, Yoon-Kyu *(Seoul National University)*; Kim, Sung June *(Seoul National University)*

**16:24-16:26** WeCT7-01.8

**A Novel Hidden Markov Model-Based Pattern Discrimination Method with the Anomaly Detection for EMG Signals**

Mukaeda, Takayuki\* *(Graduate School of Engineering, Yokohama National University)*; Shima, Keisuke *(Yokohama National University)*

**16:26-16:28** WeCT7-01.9

**Robust Tracking of Dexterous Continuum Robots: Fusing FBG Shape Sensing and Stereo Vision**

Zhang, Rumei *(Shenyang Institute of Automation (SIA), Chinese Academy of Scien)*; Zhou, Yuanyuan *(Shenyang Institute of Automation, Chinese Academy of Sciences)*; Kong, Lingzhi *(Northeastern Univ.)*; Han, Jianda *(the State Key Laboratory of Robotics, Shenyang Institute of Autom)*; Liu, Hao\* *(Shenyang Institute of Automation, Chinese Academy of Sciences)*

**16:28-16:30** WeCT7-01.10

**A Distributed Cerebellar-Inspired Learning Model for Robotic Arm Control**

Lin, Xiangqian *(Dalian University of Technology)*; Liu, Rong\* *(Dalian University of Technology)*

**16:30-16:32** WeCT7-01.11

**A Theoretical Study and Implementation of Spinal Traction System with Real-Time Biosignal Feedback System**

Chang, Hojong\* *(Institute for Information Technology Convergence, KAIST)*; Kim, Tae-Ho *(KAIST)*; Nam, Hyoung Ho *(E-ONE Co., Ltd.)*; Kim, Ki-duk *(Sun Medical Center)*

**16:32-16:34** WeCT7-01.12

**Augmented Marker Tracking for Peri-Acetabular Osteotomy Surgery**

Pflugi, Silvio *(University of Bern)*; Vasireddy, Rakesh *(Institute for Surgical Technology and Biomechanics, University o)*; Lerch, Till *(Dept. of Orthopedic Surgery, Inselspital, University of Ber)*; Ecker, Timo Michael *(Dept. of Orthopedic Surgery, Inselspital, University of Ber)*; Tannast, Moritz *(Dept. of Orthopedic Surgery, Inselspital, University of Ber)*; Boemke, Nane *(Institute for Anatomy, University of Bern)*; Siebenrock, Klaus *(Dept. of Orthopedic Surgery, Inselspital, University of Ber)*; Zheng, Guoyan\* *(University of Bern)*

**16:34-16:36** WeCT7-01.13

**Efficacy of a Knee Orthosis that uses an Elastic Element**

Kamada, Ippei\* *(Osaka University)*; Uemura, Mitsunori *(Osaka University)*; Hirai, Hiroaki *(Osaka University)*; Miyazaki, Fumio *(Osaka University)*

**16:36-16:38** WeCT7-01.14

**Design and Development of Platform Ankle Rehabilitation Robot with Shape Memory Alloy based Actuator**

Chong, Tune Hau *(Monash University Malaysia)*; Gouwanda, Darwin\* *(Monash University Malaysia)*; Gopalai, Alpha Agape *(Curtin University Sarawak Campus)*; Low, Cheng Yee *(Universiti Teknologi MARA)*; Hanapiah, Fazah Akhtar *(Universiti Teknologi Mara)*

**16:38-16:40** WeCT7-01.15

**Shape Memory Effect of Nano-Ferromagnetic Particle Doped NiTi for Orthopedic Devices and Rehabilitation Techniques**

Gautam, Arvind Kumar *(IIT Hyderabad)*; Balouria, Anuradha *(IIT Hyderabad)*; Acharyya, Amit\* *(Indian Institute of Technology Hyderabad)*; Acharyya, Swati Ghosh *(UOH Hyderabad)*; Panwar, Madhuri *(IIT Hyderabad)*; Naik, Ganesh R *(University of Technology Sydney)*

**16:40-16:42** WeCT7-01.16

**Effects of Wide Step Walking on Swing Phase Hip Muscle Forces and Spatio-Temporal Gait Parameters**

Bajelan, Soheil *(Victoria University, Melbourne)*; Nagano, Hanatsu *(Victoria University)*; Sparrow, William *(Victoria University)*; Begg, Rezaul\* *(Victoria University)*

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**WeCT7-02: 16:10-17:10** Herrick Room
**Assistive and Cognitive Robotics in Aided Living** (Poster Session)

**16:10-16:12** WeCT7-02.1

**Design of a Speech to Sign Language Transliteration System**

Acostupa, Juan José\* *(Nacional University of Engineering)*; Campos Trinidad, Maykol Jiampiers *(National University of Engineering)*; López Zapata, Erwin Daniel *(Universidad Nacional de Ingeniería)*; Salazar Arévalo, Renzo Sebastián *(National University of Engineering)*

**WeCT7-03:** 16:10-17:10        Herrick Room
**Biomechanics and Robotics – Clinical Evaluation in Rehabilitation and Orthopedics** (Poster Session)

16:10-16:12        WeCT7-03.1
**The Effect of Foot Pressure and Maximal Oxygen Consumption According to Muscle Imbalance Improvement using Sound Feedback**
Kang, Seung Rok *(Jeonbuk Natl. Univ.)*; Hong, ChulUn *(Chonbuk Natl. Univ.)*; Kwon, Taekyu\* *(Chonbuk Natl. Univ.)*

**WeCT7-04:** 16:10-17:10        Herrick Room
**Biomechanics and Robotics in Sports** (Poster Session)

16:10-16:12        WeCT7-04.1
**Passive Knee Exoskeleton for Cycling Assistance: Wavelet Spectral Analysis of EMG Signals in Dynamic Exercise**
Chaichaowarat, Ronnapee\* *(Tohoku University)*; Kinugawa, Jun *(Tohoku University)*; Kosuge, Kazuhiro *(Tohoku University)*

**WeCT7-05:** 16:10-17:10        Herrick Room
**Hardware and Control Developments in Rehabilitation Robotics** (Poster Session)

16:10-16:12        WeCT7-05.1
**Development of Electromagnetic Manipulation Nano-Robot Treatment System**
Tumurbaatar, Batgerel\* *(Chonbuk National Univ.)*; Lee, Jun Hee *(Chonbuk National Univ.)*; Kim, Jeong In *(Chonbuk National Univ.)*; Park, Chan Hee *(Chonbuk National Univ.)*; Kim, Cheol Sang *(Chonbuk National Univ.)*

16:12-16:14        WeCT7-05.2
**A Pilot Study to Investigate How the Speed of Flipping up a Seat of Assist Chairs Affects Sit-to-Stand**
Suda, Atsushi\* *(National Institute of Technology, Maizuru College)*; Suzuki, Tatsuto *(University College London)*; Ohnishi, Hiro *(National Institute of Technology, Maizuru College)*; Muromaki, Takao *(National Institute of Technology, Maizuru College)*; Nick, Tyler *(University College London)*

16:14-16:16        WeCT7-05.3
**A Preliminary Study for Evaluation of a Belt-Driven Assistive Robot Applied to Vocal Amplification**
Lee, Sang-Yoep *(Seoul National University)*; Cho, Kyu-Jin\* *(Seoul National University)*

**WeCT7-06:** 16:10-17:10        Herrick Room
**Humanoid Robotics** (Poster Session)

16:10-16:12        WeCT7-06.1
**Design and Drive System of a Robotic Hand Oriented to Interpret Sign Language**
Campos Trinidad, Maykol Jiampiers *(National University of Engineering)*; López Zapata, Erwin Daniel\* *(Universidad Nacional de Ingeniería)*; Acostupa, Juan José *(Nacional University of Engineering)*; Salazar Arévalo, Renzo Sebastián *(National University of Engineering)*

**WeCT7-07:** 16:10-17:10        Herrick Room
**Rehabilitation Robotics and Biomechanics – Exoskeleton Robotics** (Poster Session)

16:10-16:12        WeCT7-07.1
**Biomechanical Hip Mechanism for a Novel Flexible Exoskeleton**
Lee, Minhyung\* *(Samsung Advanced Institute and Tech.)*; Lee, Younbaek *(SAIT (Samsung Advanced Institute of Tech.))*; Lee, Jongwon *(Samsung Electronics Co., Ltd.)*; Choi, ByungJune *(Samsung Advanced Institute of Tech.)*; Kim, Jeonghun *(SAIT (Samsung Advanced Institute of Tech.))*

16:12-16:14        WeCT7-07.2
**A LQR Controller for the Walking of a Lower-Limb Rehabilitation Exoskeleton**
Miranda Pereira, P. *(Universidad Nacional de ingenieria)*; García Chávez, G.E.\* *(Universidad Nacional de Ingeniería)*; Choquehuanca, E. *(Universidad Nacional de Ingenieria)*; Milián Ccopa, L.P. *(Universidad Nacional de Ingenieria)*

16:14-16:16        WeCT7-07.3
**Standing Balance Exercise using Lower Limb Exoskeleton**
Choi, Taejin *(Korea Institute of Science & Tech.)*; Chong, Eunsuk *(Korea Institute of Science & Tech.)*; Hwang, Yoha *(Korea Institute of Science & Tech.)*; Kim, Seung-Jong *(Korea Institute of Science & Tech.)*; Kim, Hyungmin *(Korea Institute of Science & Tech.)*; Lee, Jong Min\* *(Korea Institute of Science & Tech.)*; Choi, Junhyuk *(Korea Institute of Science & Tech.)*; Lee, Jiyeon *(Foundation for Industry Corporation, Univ. of Ulsan)*; Chun, Min Ho *(Asan Medical Center, Univ. of Ulsan)*

16:16-16:18        WeCT7-07.4
**A Double 4-Bar Linkages Mechanism for Ankle Assist Device**
Kim, Jeonghun\* *(SAIT (Samsung Advanced Institute of Tech.))*; Choi, Hyun Do *(SAIT (Samsung Advanced Institute of Tech.))*; Shim, Youngbo *(Samsung Advanced Institute of Tech.)*

**WeCT8-01:** 16:10-17:10        Schwan Room
**Brain Physiology and Modeling I** (Poster Session)

16:10-16:12        WeCT8-01.1
**Change in Functional Networks for Transitions between States of Consciousness during Midazolam-Induced Sedation**
Lee, Minji *(Korea University)*; Sanders, Robert D. *(University of Wisconsin)*; Yeom, Seul-Ki *(Korea University)*; Won, Dong-Ok *(Korea University)*; Kim, Hwi-Jae *(Korea University)*; Lee, Bo-Ram *(Korea University)*; Seo, Kwang-Suk *(Seoul National University Dental Hospital)*; Kim, Hyun Jeong *(Seoul National University Dental Hospital)*; Tononi, Giulio *(University of Wisconsin)*; Lee, Seong-Whan\* *(Korea University)*

16:12-16:14        WeCT8-01.2
**Neuronal Activity in Human Anterior Cingulate Cortex Modulates with Internal Cognitive State during Multi-Source Interference Task**
Walmer, Matthew *(Johns Hopkins Univ.)*; Sklar, Samuel *(Johns Hopkins Univ.)*; Sacré, Pierre *(Johns Hopkins Univ.)*; Schevon, Catherine *(Columbia Univ. Medical Center)*; Srinivasan, Shraddha *(Columbia Univ. Medical Center)*; Banks, Garrett *(Columbia Univ. Medical Center)*; Yates, Mark *(Columbia Univ. Medical Center)*; McKhann, Guy *(Columbia Univ. Medical Center)*; Sheth, Sameer *(Columbia Univ. Medical Center)*; Sarma, Sridevi V. *(Johns Hopkins Univ.)*; Smith, Elliot\* *(Columbia Univ. Medical Center)*

16:14-16:16        WeCT8-01.3
**Spatial Constraints of Binocularly Matched Information on Perceived Depth Resulted from Temporal Interocular Asynchrony**
Bi, Fanya *(School of Biomedical Engineering, Shanghai Jiao Tong University)*; Ni, Rui *(Dept. of Psychology, Wichita State University)*; Chen, Yao\* *(Shanghai Jiao Tong University)*

16:16-16:18        WeCT8-01.4
**An Input-Output Linear Time Invariant Model Captures Neuronal Firing Response to External and Behavioral Events**
D'Aleo, Raina\* *(Johns Hopkins Univ.)*; Rouse, Adam *(Univ. of Rochester Medical Center)*; Schieber, Marc *(Univ. of Rochester)*; Sarma, Sridevi V. *(Johns Hopkins Univ.)*

16:18-16:20        WeCT8-01.5
**Localizing Neuronal Somata from Multi-Electrode Array In-Vivo Recordings using Deep Learning**
Buccino, Alessio Paolo\* *(University of Oslo)*; Ness, Torbjørn V *(Norwegian University of Life Sciences)*; Einevoll, Gaute *(Norwegian University of Life Sciences)*; Cauwenberghs, Gert *(University of California San Diego)*; Häfliger, Philipp *(University of Oslo, Dept. of Informatics)*

16:20-16:22        WeCT8-01.6
**Electro-Mechanical Response of a 3D Nerve Bundle Model to Mechanical Loads Leading to Axonal Injury**
Cinelli, Ilaria\* *(NUI of Galway)*; Destrade, Michel *(CNRS / Universite Pierre et Marie Curie)*; Duffy, Maeve *(NUI Galway)*; McHugh, Peter *(NUI of Galway)*

**16:22-16:24**      WeCT8-01.7

**EEG Alpha Power Change during Working Memory Encoding in Adults with Different Memory Performance Levels**

Wang, Ruimin* *(Kyushu University)*; Kamezawa, Risako *(Graduate School of Systems Life Sciences, Kyushu University)*; Watanabe, Aiko *(Kyushu University)*; Iramina, Keiji *(Kyushu University, Japan)*

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**WeCT8-02:** 16:10-17:10      Schwan Room
**Brain-Computer Interface IV** (Poster Session)

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**16:12-16:14**      WeCT8-02.2

**Finger Movements are Mainly Represented by a Linear Transformation of Energy in Band-Specific ECoG Signals**

Marjaninejad, Ali *(University of Southern California)*; Taherian, Babak *(University of Southern California)*; Valero-Cuevas, Francisco* *(University of Southern California)*

**16:14-16:16**      WeCT8-02.3

**Active Brainwave Pattern Generation for Brain-to-Machine Communication**

Ganesh, Swathi *(San Diego State Univ.)*; Timm, Dale *(San Diego State Univ.)*; Moon, Kee* *(San Diego State University)*; Lee, Sung Q *(ETRI)*; Youm, Woosub *(ETRI)*

**16:16-16:18**      WeCT8-02.4

**A Sloreta Study for Gaze-Independent BCI Speller**

An, Xingwei* *(Tianjin University)*; Wei, Jinwen *(Tianjin University)*; Liu, Shuang *(Tianjin University)*; Ming, Dong *(Tianjin University)*

**16:18-16:20**      WeCT8-02.5

**The Effect of Semantic Congruence for Visual-Auditory Bimodal Stimuli**

An, Xingwei* *(Tianjin Univ.)*; Cao, Yong *(China Astronaut Research and Training Center)*; Wei, Jinwen *(Tianjin Univ.)*; Liu, Shuang *(Tianjin Univ.)*; Jiao, Xuejun *(China Astronaut Research and Training Center)*; Ming, Dong *(Tianjin Univ.)*

**16:20-16:22**      WeCT8-02.6

**A Brain Machine Interface for Command based Control of a Wheelchair using Conditioning of Oscillatory Brain Activity**

Hamad, Eyad* *(German Jordanian University)*; Al-Gharabli, Samer *(Pharmaceutical and Chemical Engineering Dept., German Jorda)*; Saket, Munib *(Pharmaceutical and Chemical Engineering Dept., German Jorda)*; Jubran, Omar *(German Jordanian University)*

**16:22-16:24**      WeCT8-02.7

**A Hybrid BCI Web Browser based on EEG and EOG Signals**

He, Shenghong *(South China University of Technology)*; Yu, Tianyou *(South China University of Technology, Chinese)*; Gu, Zhenghui *(South China University of Technology, China)*; Li, Yuanqing* *(South China University of Technology)*

**16:24-16:26**      WeCT8-02.8

**A Real-Time Spike Sorting Method based on the Embedded GPU**

Yang, Zelan *(Zhejiang University)*; Zhang, Shaomin *(Zhejiang University)*; Xu, Kedi *(Zhejiang University, Qiushi Academy for Advanced Studies)*; Tian, Xiang* *(Zhejiang University)*; Zheng, Xiaoxiang *(Zhejiang University)*

**16:26-16:28**      WeCT8-02.9

**Performance Predictors of Motor Imagery Brain-Computer Interface based on Spatial Abilities for Upper Limb Rehabilitation**

Pacheco, Kevin *(Cayetano Heredia University)*; Acuña, Kevin José *(Pontifical Catholic University of Peru)*; Carranza, Erick *(Pontificia Universidad Católica del Perú)*; Achanccaray, David* *(Pontifical Catholic University of Peru)*; Andreu-Perez, Javier *(Imperial College London)*

**16:28-16:30**      WeCT8-02.10

**Facial Expression Classification using EEG and Gyroscope Signals**

Toth, Jake *(University of Sheffield)*; Arvaneh, Mahnaz* *(University of Sheffield)*

**16:30-16:32**      WeCT8-02.11

**EEG-Based Classification of Bilingual Unspoken Speech using ANN**

Balaji, Advait* *(BITS Pilani KK Birla Goa Campus)*; Haldar, Aparajita *(Birla Institute of Technology and Science, Pilani, K K Birla Goa)*; Patil, Keshav *(Birla Institute of Technology and Science, Pilani, K. K. Birla G)*; Thandayam, Sai Ruthvik *(BITS Pilani KK Birla Goa Campus)*; C A, Valliappan *(BITS Pilani KK Birla Goa Campus)*; Jartarkar, Mayur *(Birla Institute of Technology and Science, Pilani, K. K. Birla G)*; Baths, Veeky *(BITS Pilani KK Birla Goa Campus)*

**16:32-16:34**      WeCT8-02.12

**Quantifying the Maladaptive Neurophysiological Correlates Leading to Lapses of Attention during the SART: Towards Real-Time Mental State Monitoring of Mind-Wandering**

Martel, Adrien* *(Trinity College Dublin)*; Arvaneh, Mahnaz *(University of Sheffield)*; Taylor, Adam *(The University of Sheffield)*; Dockree, Paul *(Trinity College Dublin)*; Robertson, Ian *(Trinity College Dublin)*

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**WeCT8-03:** 16:10-17:10      Schwan Room
**Neural Signal Processing III** (Poster Session)

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**16:10-16:12**      WeCT8-03.1

**A Pilot Study on the Evaluation of Normal Phonating Function based on High-Density sEMG Topographic Maps**

Zhu, Mingxing *(ShenZhen Institutes of Advanced Tech. Chinese Academy of Sc)*; Liang, Faya *(Otorhinolaryngology Head & Neck Dept., Sun Yat - Sen Me)*; Samuel, Oluwarotimi Williams *(Shenzhen Institutes of Advanced Tech.)*; Chen, Shixiong* *(Shenzhen Institutes of Advanced Tech.)*; Yang, Wanzhang *(Dept. of Rehabilitation Medicine, Shenzhen Sixth People's H)*; Lu, Lin *(Rehabilitation Dept., Shenzhen Hospital of Southern Med)*; Zou, Haiqing *(Shenzhen Yingda Strong Tech. Co.)*; Li, Peng *(Third Affiliated Hospital of Sun Yat-Sen Univ.)*; Li, Guanglin *(Shenzhen Institutes of Advanced Tech.)*

**16:12-16:14**      WeCT8-03.2

**Classification of Multi-Class Motor Imagery EEG using Four Band Common Spatial Pattern**

Mahmood, Amama* *(School of Electrical Engineering and Computer Science, Natl.)*; Zainab, Rida *(School of Electrical Engineering and Computer Science, Natl.)*; Ahmad, Rushda Basir *(School of Electrical Engineering and Computer Science, Natl.)*; Saeed, Maryam *(School of Electrical Engineering and Computer Science, Natl.)*; Kamboh, Awais Mehmood *(School of Electrical Engineering and Computer Science, Natl.)*

**16:14-16:16**      WeCT8-03.3

**Information Processing of Passive Joint Motion to Spinal Nervous System**

Matsubara, Sigehito* *(Kumamoto Health Science Univ.)*; Igasaki, Tomohiko *(Kumamoto Univ.)*; Iiyama, Junichi *(Kumamoto Health Science Univ.)*; Murayama, Nobuki *(Kumamoto Univ.)*

**16:16-16:18**      WeCT8-03.4

**Comparative Evaluation of Different Wavelet Thresholding Methods for Neural Signal Processing**

Barabino, Gianluca *(University of Cagliari)*; Baldazzi, Giulia *(University of Cagliari)*; Sulas, Eleonora *(University of Cagliari)*; Carboni, Caterina* *(Università di cagliari)*; Raffo, Luigi *(University of Cagliari)*; Pani, Danilo *(University of Cagliari)*

**16:18-16:20**      WeCT8-03.5

**Multi-Resolution Multi-Trial Sparse Classification Model for Decoding Visual Memories from Hippocampal Spikes in Human**

Song, Dong* *(University of Southern California)*; She, Xiwei *(Zhejiang University)*; Hampson, Robert *(Wake Forest School of Medicine)*; Deadwyler, Sam *(Wake Forest University)*; Berger, Theodore *(University of Southern California)*

**Neurological Disorders II** (Poster Session)

16:10-16:12      WeCT8-04.1

**Performance Analysis of Risk-Aware Control in Upper Limb of Patients with Post-Stroke Hemiparesis**

Hao, Huaqing *(Shanghai Jiao Tong Univ.)*; Gu, Lin *(Shanghai Ruijin Rehabilitation Hospital)*; Bao, Yong *(Dept. of Rehabilitation Medicine, Ruijin Rehabilitation Hospital)*; Xie, Qing *(Ruijin Hospital Shanghai Jiaotong Univ. School of Medicine)*; Lan, Ning *(Shanghai Jiao Tong Univ.)*; Niu, Chuanxin M.* *(Ruijin Hospital, School of Medicine, Shanghai Jiao Tong Univ.)*

16:12-16:14      WeCT8-04.2

**A Novel HFO-Based Method for Unsupervised Localization of the Seizure Onset Zone in Drug-Resistant Epilepsy**

Murphy, Paige *(Univ. of Connecticut)*; von Paternos, Adam *(Univ. of Connecticut)*; Santaniello, Sabato* *(Univ. of Connecticut)*

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WeCT9-01: 16:10-17:10      Plonsey Room

**Neural Interfaces II** (Poster Session)

16:10-16:12      WeCT9-01.1

**Nanostructured Platinum as an Electrochemically and Mechanically Stable Electrode Coating**

Boehler, Christian* *(University of Freiburg)*; Oberueber, Felix *(University of Freiburg)*; Stieglitz, Thomas *(University of Freiburg)*; Asplund, Maria *(University of Freiburg)*

16:12-16:14      WeCT9-01.2

**Signal Correlation between Wet and Original Dry Electrodes in Electroencephalogram According to the Contact Impedance of Dry Electrodes**

Higashi, Yuichiro *(University of Hyogo)*; Yokota, Yusuke *(National Institute of Information and Communications Technology)*; Naruse, Yasushi* *(National Institute of Information and Communications Technology)*

16:14-16:16      WeCT9-01.3

**Design of Experiment Evaluation of Sputtered Thin Film Platinum Surface Metallization on Alumina Substrate for Implantable Conductive Structures**

Kiele, Patrick* *(University of Freiburg)*; Čvančara, Paul *(University of Freiburg)*; Mueller, Matthias *(University of Freiburg)*; Stieglitz, Thomas *(University of Freiburg)*

16:16-16:18      WeCT9-01.4

**High Performance Iridium Oxide/Platinum Nano-Leaves Composite Coatings on Microelectrodes for Neural Stimulation/Recording**

Zeng, Qi *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Xia, Kai *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Sun, Bin *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Wu, Tianzhun* *(Shenzhen Institutes of Advanced Technology (SIAT), Chinese Acade)*; Humayun, Mark *(University of Southern California)*

16:18-16:20      WeCT9-01.5

**Low SNR Neural Spike Detection using Scaled Energy Operators for Implantable Brain Circuits**

Tariq, Taimoor* *(School of Electrical Engineering and Computer Science, Natl.)*; Satti, Muhammad Hashim *(School of Electrical Engineering and Computer Science, Natl.)*; Saeed, Maryam *(School of Electrical Engineering and Computer Science, Natl.)*; Kamboh, Awais Mehmood *(School of Electrical Engineering and Computer Science, Natl.)*

16:20-16:22      WeCT9-01.6

**Building Wireless Implantable Neural Interfaces within Weeks for Neuroscientists**

Bentler, Christian* *(Universtität Freiburg)*; Stieglitz, Thomas *(University of Freiburg)*

16:22-16:24      WeCT9-01.7

**Safe Direct Current Stimulator Design for Reduced Power Consumption and Increased Reliability**

Fridman, Gene* *(Johns Hopkins University)*

16:24-16:26      WeCT9-01.8

**A Miniaturized UWB Antenna for Implantable Data Telemetry**

Haas, Michael* *(University of Ulm)*; Schweizer, Benedikt *(University of Ulm)*; Anders, Jens *(University of Ulm)*; Ortmanns, Maurits *(University of Ulm)*

16:26-16:28      WeCT9-01.9

**3D Printed Wire Electrode Carrier for a Pilot Study of the Functional Brain Mapping**

Baek, Changhoon *(Seoul National University)*; Jang, Jungwoo *(Seoul National University)*; Park, Sangwan *(Seoul National University College of Veterinary Medicine)*; Song, Yoon-Kyu *(Seoul National University)*; Seo, Kangmoon *(Seoul National University College of Veterinary Medicine)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

16:28-16:30      WeCT9-01.10

**A Convex-Shaped, PDMS-Parylene Hybrid MultiChannel ECoG-Electrode Array**

Lee, Woo Ram *(Seoul National University, EFE lab)*; Im, Changkyun *(BK21 Plus Seoul National University)*; Koh, Chin Su *(Yonsei University)*; Kim, Jun-Min* *(Seoul University)*; Seo, Jong Mo *(Seoul National University, School of Engineering)*; Shin, Hyung-Cheul *(Hallym University)*

16:30-16:32      WeCT9-01.11

**Flexible Microelectrode Array for Retinal Prosthesis**

Sun, Bin *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Li, Tengyue *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Xia, Kai *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Zeng, Qi *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Wu, Tianzhun* *(Shenzhen Institutes of Advanced Technology (SIAT), Chinese Acade)*; Humayun, Mark *(University of Southern California)*

16:32-16:34      WeCT9-01.12

**A Comparative Study of Light and Electrically Evoked Response of Retinal Ganglion Cells**

Biswas, Satarupa *(Indian Institute of Technology (IIT), Kharagpur)*; Sikdar, Debdeep *(IIT Kharagpur)*; Das, Soumen *(Indian Institute of Technology, Kharagpur)*; Mahadevappa, Manjunatha* *(Indian Institute of Technology Kharagpur)*

16:34-16:36      WeCT9-01.13

**Chitosan Conduit Combined with Naringin Facilitate Remyelination in Injured Sciatic Nerves by Increasing Neurotrophins**

Rong, Wei *(Beijing Tsinghua Chang Gung Hospital, Tsinghua University)*; Cai, Xu *(Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital)*; Pan, Yongwei *(Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital)*; Song, Fei *(Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital)*; Zhao, Zhe *(Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital)*; Sun, Changjiao *(Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital)*; Xiao, Songhua* *(Beijing Tsinghua Chang Gung Hospital, Tsinghua University)*

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WeCT9-02: 16:10-17:10      Plonsey Room

**Neural Stimulation III** (Poster Session)

16:10-16:12      WeCT9-02.1

**Imaging of Population Spikes Induced by Repetitive Stimulus Pulses in Mouse Cerebral Slices in Vitro**

Nomoto, Tomohiro *(Osaka University)*; Tanaka, Yuta *(Osaka University)*; Hayashida, Yuki* *(Osaka University)*; Yagi, Tetsuya *(Osaka University, Gard. Eng)*

16:12-16:14      WeCT9-02.2

**Subdural Recordings from an Awake Human Brain for Measuring Current Intensity during Transcranial Direct Current Stimulation**

Salimpour, Yousef* *(Johns Hopkins School of Medicine)*; Liu, Chang-Chia *(Johns Hopkins University)*; Webber, William Robert (Bob) *(Johns Hopkins University)*; Mills, Kelly *(Johns Hopkins University)*; Anderson, William S. *(Johns Hopkins School of Medicine, Dept. of Neurosurgery)*

16:14-16:16     WeCT9-02.3

**Effects of Anode Position on the Responses Elicited by Transcutaneous Spinal Cord Stimulation**

Masugi, Yohei* *(Tokyo International University)*; Obata, Hiroki *(Kyushu Institute of Technology)*; Nakazawa, Kimitaka *(The University of Tokyo)*

16:16-16:18     WeCT9-02.4

**A Pilot Study of Planar Coil based Magnetic Stimulation using Acute Hippocampal Slice in Mice**

Park, Heejin *(Gwangju Institute of Science and Technology)*; Kang, HeeKyung *(Chonnam National Univ.)*; Wang, Ming *(Chonnam National Univ. Hospital)*; Chung, Euiheon *(Gwangju Institute of Science and Technology)*; Jo, Jihoon *(Chonnam National Univ. Medical School)*; Kim, Sohee* *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:18-16:20     WeCT9-02.5

**Localization of Ultrasound Waveform for Low Intensity Ultrasound-Induced Neuromodulation in a Mouse Model**

Song, Kang-Il* *(Korea Institute of Science and Technology)*; Lee, Seul *(College of Dentistry, Kyung Hee University)*; Park, Sunghee *(Korea Institute of Science and Technology)*; Hwang, Dosik *(Yonsei University)*; Kim, Hyungmin *(Korea Institute of Science and Technology)*; Youn, Inchan *(Korea Institute of Science and Technology)*

16:20-16:22     WeCT9-02.6

**Research on the Synchronous Detection of Neuronal Signals under a Nerve Stimulation System Control**

Zhang, Yu *(Chinese Academy of Sciences, Institutes of Electronics)*; Xu, Shengwei *(Institute of Electronics, Chinese Academy of Science)*; Yang, Lili *(University of Chinese Academy of Sciences)*; Xiao, Guihua *(University of Chinese Academy of Sciences)*; Zhang, Song *(Institute of Electronics, Chinese Academy of Sciences)*; Gao, Fei *(Chinese Academy of Sciences, Institutes of Electronics)*; Li, Ziyue *(Chinese Academy of Sciences, Institutes of Electronics)*; Wang, Mixia *(Institute of Electronics, Chinese Academy of Sciences)*; Song, Yilin *(Institute of Electronics, Chinese Academy of Science)*; Cai, Xinxia* *(Institute of Electronics, Chinese Academy of Sciences)*

16:22-16:24     WeCT9-02.7

**In-Vitro Validation of a Closed-Loop Optogenetic Stimulation Device**

Edward, Epsy Shiny* *(Deakin University)*; Kouzani, Abbas Z. *(Deakin University)*

WeCT9-03: 16:10-17:10     Plonsey Room
**Neurorehabilitation II** (Poster Session)

16:10-16:12     WeCT9-03.1

**Optimal Inter-Stimulus Interval for Paired Associative Stimulation with Mechanical Stimulation**

Kim, Euisun* *(Georgia Institute of Technology)*; Ueda, Jun *(Georgia Institute of Technology)*; Shinohara, Minoru *(Georgia Institute of Technology)*

16:12-16:14     WeCT9-03.2

**Restoring Proper Task Mechanics of the Hand Post-Stroke by Targeted Assistance of Hand Muscles**

Lee, Sang Wook* *(Catholic University of America)*; Vermillion, Billt *(Catholic University of America)*; Sandri Heidner, Gustavo *(The Catholic University of America)*

16:14-16:16     WeCT9-03.3

**Weight Drop Impact System and Its Output Signal Analysis for Inducing Large Animal Spinal Cord Injury Model**

Kim, Hyeongbeom *(Dankook Univ., Collage of Medicine, Dept. of Biomedical Engineer)*; Kim, Jong-Wan *(Dankook Univ., Institute of Tissue Regeneration Engineering)*; Hyun, Jung Keun *(Dankook University)*; Chung, Phil-Sang *(Dankook Univ., Dept. of Otolaryngology, BLI Korea)*; Park, Ilyong* *(Dankook Univ., Collage of Medicine, Dept. of Biomedical Engineer)*

16:16-16:18     WeCT9-03.4

**Motor Imagery Enhancement Paradigm using Moving Rubber Hand Illusion System**

Song, Minsu *(DGIST (Daegu Gyeongbuk Institute of Science and Technology))*; Kim, Jonghyun* *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:18-16:20     WeCT9-03.5

**The Impact of an Anti-Gravity Treadmill (AlterG) Training on Walking Capacity and Corticospinal Tract Structure in Children with Cerebral Palsy**

Azizi, Shahla *(Dept. of Medical Physics and Biomedical Engineering,)*; Marzbani, Hengameh *(Tehran University of Medical Sciences)*; Raminfard, Samira *(Dept. of Neuroscience and Addiction Studies, School of Adva)*; Moradi Birgani, Parmida *(Tehran University of Medical Sciences)*; Rasooli, Amirhossein *(Tehran University of Medical Sciences)*; Mirbagheri, Mehdi* *(Northwestern University/RIC)*

16:20-16:22     WeCT9-03.6

**Oscillating Field Stimulation Inhibits Astrocyte Activation and Astroglial Scar Formation after Spinal Cord Injury in Rats**

Zhang, Cheng *(Chinese Academy of Sciences, Beijing,)*; Zhang, Guanghao *(Institute of Electrical Engineering, Chinese Academy of Sciences)*; Wang, Aihua *(Chinese Academy of Sciences)*; Wu, Changzhe *(Chinese Academy of Sciences)*; Huo, Xiaolin* *(Chinese Academy of Sciences)*

16:22-16:24     WeCT9-03.7

**Quantitative Assessment for Upper-Limb Motor Function by using EMG and Kinematic Analysis in the Practice of Occupational Therapy**

Kim, Jinuk *(Handong Global Univ.)*; Kim, Hyeonseok *(Handong Global Univ.)*; Kim, Jaehyo* *(Handong Global Univ.)*

WeCT9-04: 16:10-17:10     Plonsey Room
**Sensory Neuroprostheses I** (Poster Session)

16:10-16:12     WeCT9-04.1

**A Preliminary Study to Identify a Neurophysiological Correlate of Electroacoustic Pitch Matching in Cochlear Implant Users**

Tan, Chin-Tuan* *(University of Texas, Dallas)*

16:12-16:14     WeCT9-04.2

**Retinal Electrostimulation in Rats: Activation Thresholds from Superior Colliculus and Visual Cortex Recordings**

Barriga-Rivera, Alejandro* *(Univ. of New South Wales)*; Guo, Tianruo *(Univ. of New South Wales)*; Morley, John William *(Univ. of Western Sydney)*; Lovell, Nigel H. *(Univ. of New South Wales)*; Suaning, Gregg *(The Univ. of Sydney)*

16:14-16:16     WeCT9-04.3

**Testing Stimulus Protocols in Retinal-Prosthesis Patients**

Gonzalez Calle, Alejandra* *(University of Southern California)*; Weiland, James *(University of Michigan)*

WeCT10-01: 16:10-17:10     Schmitt Room
**General and Theoretical Informatics – Data Mining II** (Poster Session)

16:10-16:12     WeCT10-01.1

**Identifying Personal Health Experience Tweets with Deep Neural Networks**

Jiang, Keyuan* *(Purdue Univ. Northwest)*; Gupta, Ravish *(Purdue Univ. Northwest)*; Gupta, Matrika *(Purdue Univ. Northwest)*; Calix, Ricardo *(Purdue Univ. Northwest)*; Bernard, Gordon *(Vanderbilt Univ. Medical Center)*

16:12-16:14     WeCT10-01.2

**Video Analysis of "YouTube Funnies" to Aid the Study of Human Gait and Falls – Preliminary Results and Proof of Concept**

Taati, Babak* *(Toronto Rehabilitation Institute and University of Toronto)*; Lohia, Pranay *(Indian Institute of Technology, Kharagpur)*; Mansfield, Avril *(Toronto Rehabilitation Institute)*; Ashraf, Ahmed *(University of Toronto)*

**16:14-16:16**  WeCT10-01.3

**3-Year Risk Prediction of Coronary Heart Disease in Hypertension Patients: A Preliminary Study**

Chen, Runge *(Shenzhen Institute of Advanced Technology, Chinese Academy of Sc)*; Yang, Yujie *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Miao, Fen *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Cai, Yun-Peng *(SIAT)*; Lin, Denan *(Shenzhen Medical Information Center)*; Zheng, Jing *(Shenzhen Medical Information Center)*; Li, Ye* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*

**16:16-16:18**  WeCT10-01.4

**Prediction of Influenza a Virus Infections in Humans using an Artificial Neural Network Learning Approach**

Chrysostomou, Charalambos* *(The Cyprus Institute)*; Seker, Huseyin *(The University of Northumbria at Newcastle)*

**16:18-16:20**  WeCT10-01.5

**Data Quality Improvement of a Multicenter Clinical Trial Dataset**

Zaccaria, Gian Maria *(Politecnico di Torino)*; Rosati, Samanta *(Politecnico di Torino)*; Castagneri, Cristina *(Politecnico di Torino)*; Ferrero, Simone *(Universita' di Torino)*; Ladetto, Marco *(Azienda Ospedaliera SS Antonio e Biagio e C.Arrigo, Alessandria)*; Boccadoro, Mario *(Universita' di Torino)*; Balestra, Gabriella* *(Politecnico di Torino)*

**16:20-16:22**  WeCT10-01.6

**Discovering Explanatory Models to Identify Relevant Tweets on Zika**

Muppalla, RoopTeja* *(Knoesis - Wright State University)*; Miller, Michele *(Wright State University)*; Banerjee, Tanvi *(Wright State University)*; Romine, William *(Wright State University)*

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**WeCT10-02:** 16:10-17:10  Schmitt Room

**Imaging Informatics – Medical Image Processing and Visualization I** (Poster Session)

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**16:10-16:12**  WeCT10-02.1

**Fast Segmentation and Modeling of Hepatic Components for the Planning of Robot-Assisted Liver Tumor Ablation**

Zhou, Jiayin* *(Institute for Infocomm Research)*; Chi, Yanling *(Institute for Infocomm Research)*; Huang, Weimin *(Institute for Infocomm Research, Agency for Science Technology a)*; Toe, Kyaw Kyar *(Institute for Infocomm Research, A*STAR)*; Chui, Chee Kong *(National University of Singapore)*; Chang, Stephen KY *(National University of Singapore)*

**16:12-16:14**  WeCT10-02.2

**Cloud Solution for Histopathological Image Analysis using Region of Interest based Compression**

Kanakatte, Aparna* *(Tata Consultancy Services)*; Subramanya, Rakshit *(TCS)*; Delampady, Ashik *(TCS)*; Nayak, Rajarama *(TCS)*; P, Balamuralidhar *(TATA Consultancy Services)*; Gubbi, Jayavardhana *(Tata Consultancy Services)*

**16:14-16:16**  WeCT10-02.3

**Analysis of Computerized Optokinetic Nystagmus Induction and Effect of Contrast on Ocular Fatigue**

Kim, Ji Sung *(Seoul National University)*; Baek, Changhoon *(Seoul National University)*; Yoo, Sunyoung *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*; Hwang, Jeong Min *(Seoul National University School of Medicine)*

**16:16-16:18**  WeCT10-02.4

**MRI based Automated Diagnosis of Alzheimer's: Fusing 3D Wavelet-Features with Clinical Data**

Ayaz, Aymen *(National University of Sciences and Technology, Islamabad, Pakis)*; Ahmad, Muhammad Zubair *(University of Manitoba)*; Khurshid, Khawar *(Michigan State University)*; Kamboh, Awais Mehmood* *(School of Electrical Engineering and Computer Science, National)*

**16:18-16:20**  WeCT10-02.5

**Semi-Automated Nasal Pap Mask Sizing using Facial Photographs**

Johnston, Benjamin* *(University of Sydney)*; McEwan, Alistair *(The University of Sydney)*; de Chazal, Philip *(University of Sydney)*

**16:20-16:22**  WeCT10-02.6

**A Hybrid Approach for Nucleus Stain Separation in Histopathological Images**

Bhat, Harsha *(TCS)*; Kanakatte, Aparna* *(Tata Consultancy Services)*; Nayak, Rajarama *(TCS)*; Gubbi, Jayavardhana *(Tata Consultancy Services)*

**16:22-16:24**  WeCT10-02.7

**Assisting People with Nystagmus through Image Stabilization: Using an ARX Model to Overcome Processing Delays**

Pölzer, Stephan *(Johannes Kepler University)*; Miesenberger, Klaus* *(Johannes Kepler University)*

**16:24-16:26**  WeCT10-02.8

**Software Implementation and Hardware Acceleration of Retinal Vessel Segmentation for Diabetic Retinopathy Screening Tests**

Cavinato, Lara* *(Politecnico di Milano)*; Fidone, Irene *(Politecnico di Milano)*; Bacis, Marco *(Politecnico di Milano)*; Del Sozzo, Emanuele *(Politecnico di Milano)*; Durelli, Gianluca Carlo *(Politecnico di Milano)*; Santambrogio, Marco *(Politecnico di Milano)*

**16:26-16:28**  WeCT10-02.9

**Detection and Classification of the Breast Abnormalities in Digital Mammograms via Regional Convolutional Neural Network**

Al-Masni, Mohammed A. *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Al-Antari, Mugahed A. *(Dept. of Biomedical Engineering, College of Electronics and)*; Jeong-min, Park *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Gi, Geon *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Kim, Tae-yeon *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Rivera, Patricio *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Valarezo Añzaco, Edwin *(Dept. of Biomedical Engineering, Kyung Hee Univ. and E)*; Han, Seung-Moo *(Dept. of Biomedical Engineering, College of Electronics and)*; Kim, Tae-Seong* *(Kyung Hee Univ.)*

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**WeCT10-03:** 16:10-17:10  Schmitt Room

**Sensor Informatics – Sensors and Sensor Systems I** (Poster Session)

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**16:10-16:12**  WeCT10-03.1

**Evaluation of NISHIJIN E-Textile for 12-Lead ECG Measurement through Automatic ECG Analyzer**

Kuroda, Tomohiro* *(Kyoto University)*; Shiomi, Hiroki *(Kyoto University)*; Minamino-Muta, Eri *(Kyoto University)*; Yamashita, Yugo *(Kyoto University)*; Iwao, Tomohide *(Kyoto University)*; Tamura, Hiroshi *(Kyoto University)*; Ueshima, Kazuo *(Teijin Frontier Co. Ltd.)*; Kimura, Takeshi *(Kyoto University)*

**16:12-16:14**  WeCT10-03.2

**Edge Caching and Dynamic Vision Sensing for Low Delay Access to Visual Medical Information**

Chen, Ziyang* *(King's College London)*; Shikh-Bahaei, Tamanna *(Queen Mary University of London)*; Luff, Paul *(King's College London)*; Shikh-Bahaei, Mohammad *(King's College London)*

**16:14-16:16**  WeCT10-03.3

**Recognizing Cigarette Smoke Inhalations using Hidden Markov Models**

Ramos-Garcia, Raul Ignacio *(University of Alabama)*; Tiffany, Stephen *(State University of New York at Buffalo)*; Sazonov, Edward* *(University of Alabama)*

16:16-16:18 WeCT10-03.4

**Electromyogram-Based Method to Secure Wireless Body Sensor Networks for Rehabilitation Systems**

Zhang, Guanghe *(Institute of Computing Tech., Chinese Academy of Sciences)*; Samuel, Oluwarotimi Williams *(Shenzhen Institutes of Advanced Tech.)*; Liu, Fanghua *(Jiangxi Normal University)*; Chen, Shixiong *(Shenzhen Institutes of Advanced Tech.)*; Zhou, Hui *(Shenzhen Institute of Advanced Tech.)*; Zhang, Haoshi *(Shenzhen Institutes of Advanced Tech.)*; Li, Guanglin* *(Shenzhen Institutes of Advanced Tech.)*

16:18-16:20 WeCT10-03.5

**A Tapping Device for Recording and Quantitative Characterization of Rhythmic/Auditory Sequences**

Piazza, Caterina *(Politecnico di Milano and Scientific Institute IRCCS E.Medea)*; Cesareo, Ambra* *(Dipartimento di Elettronica, Informazione e Bioingegneria, Polit)*; Caccia, Martina *(School of Advanced Studies IUSS Pavia –Dept. of Neurocognition)*; Reni, Gianluigi *(IRCCS)*; Lorusso, Maria Luisa *(Unit of Neuropsychology of Developmental Disorders, Scientific I)*

16:20-16:22 WeCT10-03.6

**Development of the Viewing Distance Measuring Device in Smartphone Use**

Seo, Min-Won *(Seoul National University)*; Kim, Won-jae *(Dept. of Ophthalmology, College of Medicine, Yeungnam Univ.)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*; Kim, Jun-Min *(Seoul University)*; Hwang, Jeong Min *(Seoul National University School of Medicine)*

16:22-16:24 WeCT10-03.7

**Chewing Detection from an In-Ear Microphone using Convolutional Neural Networks**

Papapanagiotou, Vasileios *(Aristotle University of Thessaloniki)*; Diou, Christos* *(Aristotle University of Thessaloniki)*; Delopoulos, Anastasios *(Aristotle University of Thessaloniki)*

16:24-16:26 WeCT10-03.8

**Automated Long-Term Contactless Temperature Monitoring in Animals via a Thermographic Camera**

Anishchenko, Lesya* *(BMSTU)*; Razevig, Vladimir *(Bauman Moscow State Technical University)*; Bugaev, Aleksandr *(Bauman Moscow State Technical University)*; Tataraidze, Alexander *(Bauman Moscow State Technical University)*

16:26-16:28 WeCT10-03.9

**Segmentation of Gait Sequences using Inertial Sensor Data in Hereditary Spastic Paraplegia**

Martindale, Christine F* *(Friedrich-Alexander-Universität Erlangen-Nürnberg)*; Strauss, Martin *(Friedrich-Alexander-Universität Erlangen-Nürnberg)*; Gaßner, Heiko *(Universitätsklinikum Erlangen, Dept. of Molecular Neurology)*; List, Julia *(Universitätsklinikum Erlangen, Dept. of Molecular Neurology)*; Müller, Meinard *(International Audio Laboratories Erlangen, Erlangen, Germany)*; Klucken, Jochen *(University Hospital Erlangen)*; Kohl, Zacharias *(Universitätsklinikum Erlangen, Dept. of Molecular Neurology)*; Eskofier, Bjoern M *(Friedrich-Alexander-Universität Erlangen-Nürnberg)*

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WeCT11-01: 16:10-17:10 Greatbatch Room
**Cardiac Electrophysiology I** (Poster Session)
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16:12-16:14 WeCT11-01.2

**A Novel Method for Mapping Cardiac Signals during Atrial Fibrillation using Sequential Data Collection**

Nguyen, Bao* *(AFTx, Inc.)*; Kurian, Thomas *(Seton Heart Institute)*; Nayeri, Payam *(Colorado School of Mines)*; Edwards, Jerome *(CardioNXT, Inc.)*; Kessman, Paul *(AFTx)*; Atkinson, Jeffrey *(AFTx)*; Hoff, William *(Colorado School of Mines)*

16:14-16:16 WeCT11-01.3

**Effects of Electrophysiological Heterogeneity on Vulnerability to Re-Entry in Human Ventricular Tissue: A Simulation Study**

Song, Biao *(Fudan University)*; Jin, Lian *(Fudan University)*; Wang, Jianfei *(Fudan University)*; Qian, Li *(Fudan University)*; Wu, Xiaomei* *(Fudan University)*

16:16-16:18 WeCT11-01.4

**Physiologically Motivated Detection of Atrial Fibrillation**

Couceiro, Ricardo* *(University of Coimbra)*; Henriques, Jorge *(University of Coimbra)*; Paiva, Rui Pedro *(University of Coimbra)*; Antunes, Manual *(University of Coimbra)*; de Carvalho, Paulo *(University of Coimbra)*

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WeCT11-02: 16:10-17:10 Greatbatch Room
**Cardiac Mechanics I** (Poster Session)
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16:10-16:12 WeCT11-02.1

**Replication of Pressure-Volume Loop with Controllable ESPVR and EDPVR Curves on a Personalized Mock Circulatory Loop based on Elastance Function**

Wang, Yaxin* *(Univ. of Cambridge)*; Smith, Peter Alex *(Texas Heart Institute)*; De Sciscio, Paul *(Univ. of Cambridge)*; Sampaio, Luiz C. *(Texas Heart Institute)*; Cohn, William E. *(Texas Heart Institute)*; Xu, Liping *(Univ. of Cambridge)*; McMahon, Richard *(Dept. of Engineering, Univ. of Cambridge)*

16:12-16:14 WeCT11-02.2

**Real-Time Model-Based Control of Afterload for in Vitro Cardiac Tissue Experimentation**

Garrett, Amy *(The University of Auckland)*; Pham, Toan *(University of Auckland)*; Loiselle, Denis *(The University of Auckland)*; Han, June-Chiew *(The University of Auckland)*; Taberner, Andrew* *(The University of Auckland)*

16:14-16:16 WeCT11-02.3

**Synergy of First Principles Modelling with Predictive Control for a Biventricular Assist Device: In Silico Evaluation Study**

Koh, Vivian* *(Univ. of Malaya)*; Ho, Yong Kuen *(Monash Univ. Malaysia)*; Stevens, Michael Charles *(Univ. of New South Wales)*; Salamonsen, Robert F *(Alfred Hospital)*; Lovell, Nigel H. *(Univ. of New South Wales)*; Lim, Einly *(Univ. of Malaya)*

16:16-16:18 WeCT11-02.4

**Monte Carlo Method Applied to the Evaluation of the Relationship between Ejection Fraction and Its Constituent Components**

Kerkhof, Peter LM* *(VU University Medical Center)*; Yoo, B.W. *(Dept. Clinical Pharmacology, Severance Hospital, Yonsei Univ.)*; Merillon, Jean Paul *(Suresnes)*; Peace, Richard A. *(Royal Victoria Infirmary, Newcastle upon Tyne Hospitals NHS Foun)*; Handly, Neal *(Dept. Emergency Medicine, Drexel University College of Medicine)*

16:18-16:20 WeCT11-02.5

**An in Vitro Study of the Influence of Monocusp Patch Size on the Hemodynamics for Reconstructing Right Ventricular Outflow Tract in Tetralogy of Fallot**

Feng, Wentao *(Beihang University)*; Yao, Jie *(Beihang University)*; Yang, Xianda *(Beihang University)*; Chu, Zhaowei *(Beihang University)*; Guo, Meng *(Beihang University)*; Wang, Lizhen *(Beihang University)*; Fan, Yubo* *(Beihang University)*

16:20-16:22 WeCT11-02.6

**Sex-Specific Aspects of Left and Right Ventricular Volume Regulation in Patients following Tetralogy of Fallot Repair**

Kerkhof, Peter LM* *(VU University Medical Center)*; Yoo, B.W. *(Dept. Clinical Pharmacology, Severance Hospital, Yonsei University)*; Van de Ven, Peter *(VU University Medical Center, Amsterdam)*; Handly, Neal *(Dept. Emergency Medicine, Drexel University College of Medicine)*

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WeCT11-03: 16:10-17:10 Greatbatch Room
**Heart Rate Variability I** (Poster Session)
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16:10-16:12 WeCT11-03.1

**Reliability Evaluation of R-R Interval Measurement Status for Time Domain Heart Rate Variability Analysis with Wearable ECG Devices**

Eguchi, Kana* *(NTT Corporation)*; Aoki, Ryosuke *(NTT Corporation)*; Yoshida, Kazuhiro *(NTT Service Evolution Laboratories)*; Yamada, Tomohiro *(NTT)*

**16:12-16:14**  WeCT11-03.2

**Real-Time Identification of Heart Rate Responses via Auxiliary-Model-Based Damped RLS Scheme**

Argha, Ahmadreza* *(Univ. of New South Wales)*; Ye, Lin *(Univ. of Technology, Sydney (UTS))*; Cao, Kai *(Univ. of Technology, Sydney)*; Su, Steven Weidong *(Univ. of Technology, Sydney)*; Celler, Branko George *(Univ. of New South Wales)*

**16:14-16:16**  WeCT11-03.3

**Simple and Objective Screening of Major Depressive Disorder by Heart Rate Variability Analysis during Paced Respiration and Mental Task Conditions**

Kobayashi, Mai* *(The University of Electro-Communications)*; Sun, Guanghao *(The University of Electro-Communications)*; Shinba, Toshikazu *(Shizuoka Saiseikai General Hospital)*; Matsui, Takemi *(Tokyo Metropolitan University)*; Kirimoto, Tetsuo *(The University of Electro-Communications)*

**16:16-16:18**  WeCT11-03.4

**The Role of Nonlinear Coupling in Human-Horse Interaction: A Preliminary Study**

Lanata', Antonio *(University of Pisa)*; Guidi, Andrea *(University of Pisa)*; Baragli, Paolo *(Dept. of Veterinary Sciences, University of Pisa)*; Valenza, Gaetano *(University of Pisa)*; Scilingo, Enzo Pasquale* *(University of Pisa)*

**16:18-16:20**  WeCT11-03.5

**Heart Rate Variability Analysis during Muscle Fatigue Due to Prolonged Isometric Contraction**

Guidi, Andrea *(University of Pisa)*; Greco, Alberto* *(University of Pisa)*; Felici, Federica *(Istituto Italiano di Tecnologia)*; Leo, Andrea *(IMT School for Advanced Studies)*; Ricciardi, Emiliano *(University of Pisa)*; Bianchi, Matteo *(University of Pisa)*; Bicchi, Antonio *(University of Pisa)*; Valenza, Gaetano *(University of Pisa)*; Scilingo, Enzo Pasquale *(University of Pisa)*

**16:20-16:22**  WeCT11-03.6

**Increased Beat-to-Beat Variation in Diastolic Phase Percentages in Patients with Congestive Heart Failure**

Li, Peng* *(Shandong University)*; Yu, Lei *(Shanxi University)*; Li, Yang *(Shandong University)*; Karmakar, Chandan *(Deakin University)*; Liu, Changchun *(Shandong University)*

**16:22-16:24**  WeCT11-03.7

**Characterization and Classification of Patients with Different Levels of Cardiac Death Risk by using Poincare Plot Analysis**

Rodriguez, Javier *(Institute for Bioengineering de Catalunya (IBEC))*; Voss, Andreas *(University of Applied Sciences Jena)*; Caminal, Pere *(Technical University of Catalonia (UPC))*; Bayes-Genis, Antoni *(Hospital de la Santa Creu i Sant Pau)*; Giraldo, Beatriz* *(Universitat Poiltècnica de Catalunya)*

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**WeCT11-04:**  16:10-17:10  Greatbatch Room
**Vascular Hemodynamics I** (Poster Session)

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**16:10-16:12**  WeCT11-04.1

**A Novel Acoustic Catheter Stethoscope based Acquisition and Signal Processing Framework to Extract Multiple Bio Signals**

Chetlur Adithya, Prashanth* *(Univ. of South Florida)*; Sankar, Ravi *(Univ. of South Florida)*; Moreno, Wilfrido *(Univ. of South Florida)*; Hart, Stuart *(Univ. of South Florida)*

**16:12-16:14**  WeCT11-04.2

**Tomographic Particle Image Velocimetry for the Validation of Hemodynamic Simulations in an Intracranial Aneurysm**

Roloff, Christoph *(University of Magdeburg)*; Berg, Philipp* *(University of Magdeburg)*; Redel, Thomas *(Siemens AG)*; Janiga, Gabor *(University of Magdeburg)*; Thévenin, Dominique *(University of Magdeburg)*

**16:14-16:16**  WeCT11-04.3

**In Search for a Better Stent: Surrogate based Multi-Objective Optimization of Stent Design under Influence of Vessel Wall Deformation**

Putra, Narendra Kurnia* *(Tohoku Univ.)*; Palar, Pramudita Satria *(Tohoku Univ.)*; Anzai, Hitomi *(Tohoku Univ.)*; Shimoyama, Koji *(Tohoku Univ.)*; Ohta, Makoto *(Univ. of Tohoku)*

**16:16-16:18**  WeCT11-04.4

**Computational Estimation of the Hemodynamic Significance of Coronary Stenoses in Arterial Branches Deriving from CCTA: A Proof-of-Concept Study**

Siogkas, Panagiotis *(FORTH-IMBB)*; Rigas, Georgios *(University of Ioannina)*; Exarchos, Themis P. *(Unit of Medical Tech & Intelligent Info)*; Sakellarios, Antonis *(Unit of Medical Technology and Application Systems, Dept of Mate)*; Papafaklis, Michail *(Medical School, University of Ioannina)*; Pelosi, Gualtiero *(Institute of Clinical Physiology, National Research Council, 561)*; Parodi, Oberdan *(CNR Clinical Physiology Institute - Milan)*; Michalis, Lampros *(University of Ioannina)*; Fotiadis, Dimitrios I.* *(University of Ioannina)*

**16:18-16:20**  WeCT11-04.5

**Development of Hand Blood Circulation Measurement System for Raynaud Syndrome using Infrared Imaging**

Hwang, Yunchan *(Seoul National University)*; Seo, Min-Won *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

**16:20-16:22**  WeCT11-04.6

**Acute Effects of Incremental Exercise on Central Hemodynamics in Young Basketball Athletes**

Zhang, Yahui *(Northeastern University)*; Qi, Lin *(Northeastern University)*; Xu, Lisheng* *(Northeastern University)*; Yao, Yang *(Northeastern University)*; Lv, Wenlong *(Northeastern University)*; Du, Chenglin *(Northeastern University)*

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**WeCT11-05:**  16:10-17:10  Greatbatch Room
**Cardiac Catheterization** (Poster Session)

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**16:10-16:12**  WeCT11-05.1

**Training Simulator for Mechanical Circulatory Support using Extra-Corporeal Membrane Oxygenation**

Gupta, Shashwat *(Univ. of Illinois at Urbana-Champaign)*; Doose, Mark Daniel *(Univ. of Illinois at Urbana-Champaign)*; Chembrammel, Pramod *(Univ. of Illinois at Urbana-Champaign)*; Raman, Jai *(Oregon Health and Sciences Univ.)*; Kesavadas, Thenkurussi* *(Univ. of Illinois at Urbana-Champaign)*

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**WeCT11-07:**  16:10-17:10  Greatbatch Room
**Cardiac Mechanics, Structure and Function – Artificial Heart and Valves** (Poster Session)

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**16:10-16:12**  WeCT11-07.1

**Evaluation of Cardiovascular Simulator with Computer Simulation**

Lee, Min Woo *(Sangji Univ. Oriental Biomedical Eng.)*; Jang, Min *(Sangji Univ. East-West Medical Eng.)*; Lee, Ju-Yeon *(Institute of Applied Medical Eng., Helmholtz Institute, R)*; Shin, Sang Hoon* *(Sangji Univ. Oriental Biomedical Engineering)*

**16:12-16:14**  WeCT11-07.2

**Handmade Tri-Leaflet Valved Stents for Pulmonary Valve Reconstruction Ex Vivo and in Vivo Study**

Chen, Wei-Ling *(Kaohsiung Veterans General Hospital)*; Kan, Chung-Dann* *(National Cheng Kung Univ. Hospital, Dept. of Surgery)*

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**WeCT11-08:**  16:10-17:10  Greatbatch Room
**Cardiac Mechanics, Structure and Function – Ventricular Assist Devices** (Poster Session)

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**16:10-16:12**  WeCT11-08.1

**Optimizing Spiral Groove Bearing Geometry to Maximize Washout in Axial Cardiac Assist Devices**

Bieritz, Shelby* *(Rice University)*; Sampaio, Luiz C. *(Texas Heart Institute)*; Grande-Allen, Jane *(Rice University)*; Cohn, William E. *(Texas Heart Institute)*; Tansley, Geoff *(Griffith University, Queensland, Australia)*

**16:12-16:14**  WeCT11-08.2

**Simple and Rapid Optical Assessment of Blood Cell Damage Caused by Electroporation**

Yano, Tetsuya* *(Hirosaki University)*; Sakota, Daisuke *(National Institute of Advanced Industrial Science and Technology)*; Mitamura, Yoshinori *(Hokkaido University)*

16:14-16:16 WeCT11-08.3

**Development of Mock Circulation System for Extracorporeal Membrane Oxygenation**

Joo, Yoon Ha *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*

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WeCT12-01: 16:10-17:10 Geddes Room
**Clinical Engineering I** (Poster Session)

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16:10-16:12 WeCT12-01.1

**IMU-Based Real-Time Pose Measurement System for Anterior Pelvic Plane in Total Hip Replacement Surgeries**

Cao, Zhe *(Tsinghua Univ.)*; Su, Shaojie *(Tsinghua Univ.)*; Tang, Hao *(Beijing Ji Shui Tan hospital)*; Zhou, Yixin *(Beijing Ji Shui Tan hospital the 4th Medical College of Peking Un)*; Wang, Zhihua *(Tsinghua Univ.)*; Chen, Hong* *(Tsinghua Univ.)*

16:12-16:14 WeCT12-01.2

**Asthma Academy: Developing Educational Technology to Improve Asthma Medication Adherence and Intervention Efficiency**

Nair, Aiswaria* *(Georgia Institute of Technology)*; Freedle, Karen *(Children's Healthcare of Atlanta, Emory University)*; Cheng, Chihwen *(Georgia Institute of Technology)*; Wang, May D. *(Georgia Tech and Emory University)*

16:14-16:16 WeCT12-01.3

**The First Transthyretin Familial Amyloid Polyneuropathy Gait Quantification Study – Preliminary Results**

Vilas-Boas, Maria* *(Faculty of Engineering, University of Porto)*; Rocha, Ana Patrícia *(University of Aveiro)*; Choupina, Hugo Miguel Pereira *(University of Porto)*; Fernandes, José Maria *(University of Aveiro)*; Coelho, Teresa *(Unidade Corino de Andrade, Hospital Santo António, Centro Hospit)*; Cunha, Joao Paulo Silva *(INESC TEC)*

16:16-16:18 WeCT12-01.4

**Automatic Positioning Device for Cutting Three-Dimensional Tissue in Living or Fixed Samples: Proof of Concept**

Quiñones, Dario Ruben *(Center for Biomaterials and Tissue Engineering, Universitat Poli)*; Pérez-Feito, Ricardo *(Thermodynamics Dept., Universitat Politècnica de València)*; García-Manrique, Juan Antonio *(Institute of Design for Manufacturing and Automated Production,)*; Canals, Santiago *(Instituto de Neurociencias, Consejo Superior de Investigaciones)*; Moratal, David* *(Universitat Politècnica de València)*

16:18-16:20 WeCT12-01.5

**Comparison of the Onset of Uterine Contractions Determined from Tocodynamometry and Maternal Perception**

Wang, Ying *(Beijing Univ. of Technology)*; Gao, Pei *(Beijing Univ. of Technology)*; Qiu, Qian *(Beijing Univ. of Technology)*; An, Yang *(Beijing Univ. of Technology)*; Hao, Dongmei* *(Beijing Univ. of Technology)*; Yang, Fangwei *(Yiwu Central Hospital)*; Zhou, Xiya *(Peking Union Medical College Hospital)*; Yang, Lin *(Beijing Univ. of Technology)*; Yang, Yimin *(Beijing Univ. of Technology)*; Li, Xuwen *(Beijing Univ. of Technology)*; Zhang, Song *(Beijing Univ. of Technology)*; Zheng, Dingchang *(Anglia Ruskin Univ.)*

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WeCT12-02: 16:10-17:10 Geddes Room
**Diagnostic Devices II** (Poster Session)

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16:22-16:24 WeCT12-02.7

**ARTSENS Orientation Navigation System: A Study Towards Faster Arterial Stiffness Measurements**

Joseph, Jayaraj* *(HTIC, Indian Institute of Technology Madras)*; ten Dam, Anne Maria *(University of Twente)*

16:24-16:26 WeCT12-02.8

**An Electrical Impedance Tomography (EIT) Multi-Electrode Needle-Probe Device for Local Assessment of Heterogeneous Tissue Impeditivity**

Meroni, Davide* *(Politecnico di Milano)*; Carpano Maglioli, Camilla *(Fondazione Istituto Italiano di Tecnologia)*; Bovio, Dario *(Politecnico di Milano)*; Greco, Francesco G. *(Bioengineering Lab)*; Aliverti, Andrea *(Politecnico di Milano)*

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16:26-16:28 WeCT12-02.9

**Estimation of Peripheral Blood Volume and Interstitial Fluid Volume in Hemodialysis Patients using Bioimpedance Techniques**

Zhu, Fansan* *(Renal Research Institute)*; Kotanko, Peter *(Renal Research Institute)*; Levin, Nathan W. *(Renal Research Institute)*

16:28-16:30 WeCT12-02.10

**Large Dynamic Range Optical Cavity based Sensor using a Low Cost Three-Laser System**

Rho, Donggee *(Baylor Univ.)*; Kim, Seung* *(Baylor Univ.)*

16:30-16:32 WeCT12-02.11

**Biomechanical Procedure to Assess Sleep Restriction on Motor Control and Learning**

Umemura, Guilherme Silva *(University of São Paulo)*; López Noriega, Carlos *(University of São Paulo)*; Soares, Daniel Fuess *(University of São Paulo)*; Forner-Cordero, Arturo* *(Polytechnic School. University of Sao Paulo)*

16:32-16:34 WeCT12-02.12

**A General Descriptor for Detecting Abnormal Action Performance from Skeletal Data**

Elkholy, Amr* *(Egypt-Japan Univ. for Science and Technology (E-JUST))*; Hus sein, Mohamed *(Egypt-Japan Univ. for Science and Technology (E-JUST))*; Gomaa, Walid *(Egypt-Japan Univ. for Science and Technology (E-JUST))*; Damen, Dima *(Univ. of Bristol)*; Saba, Emmanuel *(Alexandria Univ.)*

16:34-16:36 WeCT12-02.13

**Degree of RF MRI Coil Detuning for an Anatomically Realistic Respiratory Cycle Modeled with the Finite Element Method**

Tran, Anh Le *(Worcester Polytechnic Inst.)*; Makarov, Sergey* *(Electrical & Computer Eng., Worcester Polytechnic Inst.)*

16:36-16:38 WeCT12-02.14

**Design of the Wearable Device for Hemiplegic Gait Detection using an Accelerometer and a Gyroscope**

Shin, Hangsik* *(Chonnam National Univ.)*; Park, Sooji *(Chonnam National Univ.)*; Lee, Jun Seok *(Chonnam National Univ.)*; Kwak, Jaekyung *(Chonnam National Univ.)*

16:38-16:40 WeCT12-02.15

**Classification of Voluntary Coughs Applied to the Screening of Respiratory Disease**

Infante, Christian *(Massachusetts Institute of Technology)*; Chamberlain, Daniel *(Massachusetts Institute of Technology)*; Kodgule, Rahul *(Chest Research Foundation)*; Fletcher, Richard Ribon* *(Massachusetts Institute of Technology)*

16:40-16:42 WeCT12-02.16

**Noninvasive Evaluation of Corneal Viscoelasticity based on Displacement in Response to Acoustic Radiation Force**

Lv, Zhen *(Shenzhen Univ.)*; Wang, Qingmin *(Shenzhen Univ.)*; Liu, Fu-Long *(Shenzhen Univ.)*; Zhang, Peng-Peng *(Shenzhen Univ.)*; Gao, Xue-Hua *(Shenzhen Univ.)*; Guo, Yanrong *(Shenzhen Univ.)*; Zhang, Xin-Yu* *(Shenzhen Univ.)*

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WeCT12-03: 16:10-17:10 Geddes Room
**Health Technologies I** (Poster Session)

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16:10-16:12 WeCT12-03.1

**The Motion Influence on Respiration Rate Estimation from Low-Resolution Thermal Sequences during Attention Focusing Tasks**

Kwasniewska, Alicja *(Gdansk University of Technology)*; Ruminski, Jacek* *(Gdansk University of Technology)*; Wtorek, Jerzy *(Gdansk University of Technology)*

16:12-16:14 WeCT12-03.2

**Electroencephalographic Neurofeedback to Up-Regulate Frontal Theta Rhythms: Preliminary Results**

Shoji, Yutaka* *(RMIT Univ.)*; Cvetkovic, Dean *(RMIT Univ.)*; Patti, Chanakya Reddy *(Royal Melbourne Institute of Tech.)*

**16:14-16:16**            WeCT12-03.3

**Implementation of a Manually Operated Blood Pressure Monitor based on Energy Harvesting for use in Resource-Constrained Settings**

    Gruterich, Martin *(RWTH Aaachen University)*; Aelen, Paul *(Eindhoven Technical University)*; Wouters, Kees *(Philips Research)*; Dellimore, Kiran\* *(Philips Research)*

**16:16-16:18**            WeCT12-03.4

**Facial Geometry and Speech Analysis for Depression Detection**

    Pampouchidou, Anastasia\* *(Univ. de Bourgogne)*; Simantiraki, Olympia *(Univ. del Pais Vasco)*; Vazakopoulou, Calliope-Marina *(Tech. Educational Institute of Crete)*; Chatzaki, Charikleia *(Tech. Educational Institute of Crete)*; Pediaditis, Matthew *(ICS-FORTH)*; Maridaki, Anna *(Tech. Educational Institute of Crete)*; Marias, Kostas *(Foundation for Res. & Tech. Hellas)*; Simos, Panagiotis *(Dept. of Psychiatry, Univ. of Crete)*; Yang, Fan *(Univ. de Bourgogne)*; Meriaudeau, Fabrice *(Univ. de Bourgogne)*; Tsiknakis, Manolis *(ICS-FORTH)*

**16:18-16:20**            WeCT12-03.5

**A Novel Approach for Quantification of Contour Irregularities of Diabetic Foot Ulcers and Its Association with Ischemic Heart Disease**

    Rani, Priya *(VIT University)*; Aliahmad, Behzad\* *(RMIT University)*; Kant Kumar, Dinesh *(RMIT University)*

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**WeCT12-04:** 16:10-17:10          Geddes Room
**Therapeutic Systems I** (Poster Session)

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**16:10-16:12**            WeCT12-04.1

**Estimates of Peak Electric Fields Induced by Transcranial Magnetic Stimulation in Pregnant Women as Patients using an FEM Full-Body Model**

    Yanamadala, Janakinadh\* *(Worcester Polytechnic Institute)*; Noetscher, Gregory *(Worcester Polytechnic Institute)*; Makarov, Sergey *(Electrical and Computer Engineering, Worcester Polytechnic Inst.)*; Pascual-Leone, Alvaro *(Harvard Medical School)*

**16:12-16:14**            WeCT12-04.2

**Electric Field Characteristics of Low-Field Synchronized Transcranial Magnetic Stimulation (sTMS)**

    Deng, Zhi-De\* *(National Institute of Mental Health)*; Lisanby, Sarah *(Duke University)*

**16:14-16:16**            WeCT12-04.3

**Optimization of Transcostal Phased-Array Refocusing using Sparse Semidefinite Relaxation Method**

    Almekkawy, Mohamed\* *(Penn State University)*; McMahon, Daniel *(Penn State University)*; Alqarni, Hanan *(Penn State University)*; He, Jiayu *(Penn State University)*

**16:16-16:18**            WeCT12-04.4

**Personalization of a Compartmental Physiological Model for an Artificial Pancreas through Integration of Patient's State Estimation**

    Jallon, Pierre *(CEA Grenoble)*; Lachal, Sylvain *(CEA LETI)*; Franco, Céline *(TIMC-IMAG)*; Charpentier, Guillaume *(Centre Hospitalier Sud-Francilien, Dept. of Diabetes and En)*; Huneker, Erik *(Diabeloop)*; Doron, Maeva\* *(CEA LETI)*

**16:18-16:20**            WeCT12-04.5

**An Adaptive DC-Balanced and Multi-Mode Stimulator IC with 1GΩ Output Impedance for Compact Electro-Acupuncture System**

    Lee, Jiwon\* *(Korea Advanced Institute of Science and Technology)*; Kim, Minseo *(Korea Advanced Institute of Science and Technology (KAIST))*; Kim, Kwantae *(Korea Advanced Institute of Science and Technology (KAIST))*; Song, Kiseok *(K-healthwear)*; Lee, Sanghoon *(Kyung Hee University)*; Kim, Weon *(Kyung Hee University Hospital)*; Woo, Jong Shin *(Kyung Hee University School of Medicine)*; Yoo, Hoi-Jun *(KAIST)*

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**WeCT13-01:** 16:10-17:10          Dunn Room
**Drug Delivery Routes – Ocular Drug Delivery** (Poster Session)

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**16:10-16:12**            WeCT13-01.1

**Pen-Type Separable Microneedle for Sustained Corneal Drug Delivery**

    Lee, Kang Ju *(Yonsei Univ.)*; Cho, Wonwoo *(Yonsei Univ.)*; Song, Hyun Beom *(Seoul National Univ.)*; Kim, Jeong Hun *(Seoul National Univ.)*; Ryu, WonHyoung\* *(Yonsei Univ.)*

**16:12-16:14**            WeCT13-01.2

**Development of Mucoadhesive Nanoparticles for Topical Delivery of Dexamethasone to the Eye**

    Kim, Se Na *(Seoul National University)*; Kwak, Ji Min *(Seoul National University)*; Kim, Cho Rim *(Seoul National University)*; Huh, Beom Kang *(Seoul National University)*; Lee, Seung Ho *(Institute of Medical & Biological Engineering, Medical Research)*; Choy, Young Bin\* *(Seoul National University)*

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**WeCT13-02:** 16:10-17:10          Dunn Room
**Drug Delivery Routes – Oral drug delivery** (Poster Session)

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**16:10-16:12**            WeCT13-02.1

**Nanostructured Microparticles Embedded with Mucoadhesive Polymer for their Prolonged Retention in Gastrointestinal Tract**

    Huh, Beom Kang *(Seoul National University)*; Park, Chun Gwon *(Dana-Farber Cancer Institute)*; Kim, Se Na *(Seoul National University)*; Lee, Seung Ho *(Institute of Medical & Biological Engineering, Medical Research)*; Choy, Young Bin\* *(Seoul National University)*

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**WeCT13-03:** 16:10-17:10          Dunn Room
**Drug Delivery Routes – Transdermal Drug Delivery** (Poster Session)

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**16:10-16:12**            WeCT13-03.1

**Dissolving Microneedles Patch for Skin Vaccination**

    Lee, Jeong Woo\* *(Georgia Institute of Technology)*; Joyce, Jessica *(Georgia Institute of Technology)*; Prausnitz, Mark *(Georgia Institute of Technology)*

**16:12-16:14**            WeCT13-03.2

**NIR-Triggered Ibuprofen Release from PDMS Embedded Mesoporous Silica Coated Gold Nanorods**

    Riaz, Zertasha *(Sungkyunkwan University)*; Yoon, Seokyoung *(Sungkyunkwan University)*; Lee, Hoo Jeong *(Sungkyunkwan University)*; Lee, Jung Heon\* *(Sungkyunkwan University)*

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**WeCT13-04:** 16:10-17:10          Dunn Room
**Drug Delivery Systems and Carriers – Nucleic Acid Drug Delivery** (Poster Session)

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**16:10-16:12**            WeCT13-04.1

**A Synthetic Biology Approach to Deliver Cargos by Bacterial Carrier**

    Chao, Yun-Peng\* *(Feng Chia University)*; Chiang, Chung-Jen *(China Medical University)*

**16:12-16:14**            WeCT13-04.2

**Development of Bacterial Drug Carrier for Targeted Cancer Therapy**

    Chiang, Chung-Jen\* *(China Medical University)*; Chao, Yun-Peng *(Feng Chia University)*

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**WeCT13-06:** 16:10-17:10          Dunn Room
**Drug Release and Solubility – Controlled/Sustained/Modified Release** (Poster Session)

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**16:10-16:12**            WeCT13-06.1

**Silicone Implants Enabled with Local, Sustained Delivery of Triamcinolone**

    Jeon, Beom Su *(Seoul National University)*; Huh, Beom Kang *(Seoul National University)*; Shin, Byung Ho *(Seoul National University)*; Kim, Byung Hwi *(Seoul National University)*; Heo, Chan Yeong *(College of Medicine, Seoul National University)*; Choy, Young Bin\* *(Seoul National University)*

**WeCT13-07:** 16:10-17:10          Dunn Room
**Formulation Design – Oligonucleotide** (Poster Session)

16:10-16:12          WeCT13-07.1
**Design of Guide RNAs for CRISPR/Cas9-Mediated Alkaline Phosphatase Gene Knockout in Human Cell Line**
Bartels, Alan* *(Tufts University)*

**WeCT13-08:** 16:10-17:10          Dunn Room
**Micro and Nano Formulation – Microparticles/Microspheres** (Poster Session)

16:10-16:12          WeCT13-08.1
**Different Size and Shape of Nano/Micro Particle Fabrication via Top-Down Method**
Oh, Eun Seol *(Yonsei Univ.)*; Aryal, Susmita *(Yonsei Univ.)*; Kim, Boram *(Yonsei Univ.)*; Park, SangHyo *(Yonsei Univ.)*; Kim, Sun *(Yonsei Univ.)*; Key, Jaehong* *(Yonsei Univ.)*

**WeCT13-09:** 16:10-17:10          Dunn Room
**Micro and Nano Formulation – NanoTechnology/Nanoparticles** (Poster Session)

16:10-16:12          WeCT13-09.1
**Drug Release Control from Magnetic Thermosensitive Liposomes using Magnetic Hyperthermia and Magnetic Particle Imageing**
Shimada, Kazuki* *(Osaka University)*; Yamanaka, Saki *(Osaka University)*; Maruyama, Shuki *(Kyoto University Hospital)*; Murase, Kenya *(Osaka University)*

**WeCT13-10:** 16:10-17:10          Dunn Room
**BME and Global Health** (Poster Session)

16:10-16:12          WeCT13-10.1
**A Study on Trend and Development of Predictable Treatment Medical Device's Establishment – Software**
Yi, Jayeon *(Samsung Advanced Institute for Health Sciences & Technology)*; Yoon, Yeup* *(Sungkyungwan)*

16:12-16:14          WeCT13-10.2
**A Study on Amendment for the Medical Device Standard of Root Canal Filling Pastes and Root Canal Sealers**
Kim, Hyoung-sik* *(Ministry of Food & Drug Safety)*; Song, Harim *(Ministry of Food & Drug Safety)*; Lee, Junho *(Ministry of Food & Drug Safety)*; Nam, Eunsuk *(Ministry of Food & Drug Safety)*; Yoo, Sihyung *(Ministry of Food & Drug Safety)*; Park, Chang Won *(National Institute of Food & Drug Safety Evaluation, Ministry)*

**WeCT13-11:** 16:10-17:10          Dunn Room
**Instruction and Learning** (Poster Session)

16:10-16:12          WeCT13-11.1
**A Study on Development of a Guideline for Performance Evaluation of Intraocular Lens**
You, Jihye* *(Ministry of Food & Drug Safety)*; Yoo, Sihyung *(Ministry of Food & Drug Safety)*; Lee, Seeun *(Ministry of Food & Drug Safety)*; Kim, Sun Young *(MFDS)*; Park, Chang Won *(National Inst. of Food & Drug Safety Evaluation, Ministry)*

16:12-16:14          WeCT13-11.2
**VR-Based Support System Development for Rehabilitation Training of Children with Cerebral Palsy**
HyunJong, Lee *(Dept. of Rehabilitation & Assistive Tech., National Re)*; Hyosun, Kweon* *(Dept. of Rehabilitation & Assistive Tech., National Re)*; Jae Ho, Kim *(Dept. of Rehabilitation & Assistive Tech., National Re)*; Hyunkyung, Kim *(Dept. of Pediatric Rehabilitation, National Rehabilitation)*

**WeCT14-01:** 16:10-17:10          Schaldach Room
**Advances in Biomedical Imaging I** (Poster Session)

16:10-16:12          WeCT14-01.1
**Long Term Monitoring of a Pressure Ulcer Risk Patient using Thermal Images**
Bennett, Stephanie Louise* *(Carleton University)*; Goubran, Rafik A. *(Carleton University)*; Knoefel, Frank-Dietrich *(Bruyere Continuing Care, University of Ottawa, Carleton University)*

16:12-16:14          WeCT14-01.2
**Impact of Injection Time on Migration of SPECT Seizure Onset in Temporal Lobe Epilepsy**
Ramchuankiat, Saranya *(Faculty of Engineering, Chulalongkorn Univ.)*; Jarumaneeroj, Pisit *(Chulalongkorn Univ.)*; Limotai, Chusak *(Chulalongkorn Univ.)*; Tepmongkol, Supatporn *(Faculty of Medicine, Chulalongkorn Univ.)*; Rakvongthai, Yothin* *(Faculty of Medicine, Chulalongkorn Univ.)*

16:14-16:16          WeCT14-01.3
**Automated Age-Related Macular Degeneration Screening System using Fundus Images**
Kunumpol, Patthapol *(Thammasat University)*; Umpaipant, Wachirawit *(Thammasat University)*; Navapol, Kanchanaranya *(Thammasat University)*; Charoenpong, Theekapun *(Srinakharinwirot University)*; Vongkittirux, Sakchai *(Thammasat University)*; Kupakanjana, Tayakorn *(Thammasat University)*; Tantibundhit, Charturong* *(Thammasat University)*

16:16-16:18          WeCT14-01.4
**Multi-Scale Locally Low-Rank Noise Reduction for High-Resolution Dynamic Quantitative Cardiac MRI**
Moeller, Steen *(Univ. of Minnesota)*; Weingartner, Sebastian *(Univ. of Minnesota)*; Akcakaya, Mehmet* *(Univ. of Minnesota)*

16:18-16:20          WeCT14-01.5
**Comparative Analysis of Different Versions of a Human Model Located Inside a 1.5T MRI Whole Body RF Coil**
Kozlov, Mikhail* *(Max Planck Institute for Human Cognitive and Brain Sciences)*; Tankaria, Harshal *(Worcester Polytechnic Inst.)*; Noetscher, Gregory *(Worcester Polytechnic Institute)*; Makarov, Sergey *(Electrical and Computer Engineering, Worcester Polytechnic Instit)*

16:20-16:22          WeCT14-01.6
**Investigating the Effect of Coil Model Losses on Computational Electromagnetic Exposure of an ASTM Phantom at 64 MHz MRI**
Kozlov, Mikhail* *(Max Planck Institute for Human Cognitive & Brain Sciences)*; Horner, Marc *(ANSYS, Inc.)*; Kainz, Wolfgang *(Food & Drug Administration)*; Angelone, Leonardo M. *(US Food & Drug Administration, Center for Devices & Radiolog)*

16:22-16:24          WeCT14-01.7
**Automatic Fetal Body and Amniotic Fluid Segmentation from Fetal Ultrasound Images by Encoder-Decoder Network with Inner Layers**
Li, Yan* *(Waseda Univ.)*; Xu, Rong *(Waseda Univ.)*; Ohya, Jun *(Waseda Univ.)*; Iwata, Hiroyasu *(Waseda Univ.)*

16:24-16:26          WeCT14-01.8
**Automatic Identification of Blood Vessel Cross-Section for Central Venous Catheter Placement using a Cascading Classifier**
Ikhsan, Mohammad* *(National University of Singapore)*; Tan, Kok Kiong *(National University of Singapore)*; Putra, Andi Sudjana *(National University of Singapore)*; Chew, Tsong Huey Sophia *(Singapore General Hospital)*; Kong, Chee Fai *(Singapore General Hospital)*

16:26-16:28          WeCT14-01.9
**GPU-Based Computation for Brain Spatio-Temporal Networks Definition**
Purgato, Andrea* *(Politecnico di Milano)*; Reggiani, Enrico *(Politecnico di Milano)*; D'Arnese, Eleonora *(Politecnico di Milano)*; Berger-Wolf, Tanya *(University of Illinois at Chicago)*; Grimaldi, Marco *(Neurocenter Humanitas Research Hospital)*; Durelli, Gianluca Carlo *(Politecnico di Milano)*; Santambrogio, Marco *(Politecnico di Milano)*

**WeCT14-02:** 16:10-17:10          Schaldach Room
**Optical Imaging III** (Poster Session)

16:10-16:12          WeCT14-02.1
**Automatic Detection of Hyperreflective Foci in Optical Coherence Tomography B-Scans using Morphological Component Analysis**
Rabbani, Hossein* *(Isfahan Univ. of Medical Sciences)*; Ghasemi Kamasi, Zeinab *(West Virginia University)*; Mokhtary, Marzieh *(Isfahan University of Medical Sciences*

**16:12-16:14**  WeCT14-02.2

**Fibroatheroma Identification in Intravascular Optical Coherence Tomography Images using Deep Features**

Xu, Mengdi* *(Institute for Infocomm Research)*; Cheng, Jun *(Institute for Infocomm Research, AStar)*; Li, Annan *(Institute for Infocomm Research, ASTAR)*; Lee, Jimmy Addison *(Institute for Infocomm Research, ASTAR)*; Wong, Damon *(Institute for Infocomm Research)*; Taruya, Akira *(Wakayama Medical University)*; Tanaka, Atsushi *(Wakayama Medical University)*; Foin, Nicolas *(National Heart Centre Singapore)*; Wong, Philip *(National Heart Centre Singapore)*

**16:14-16:16**  WeCT14-02.3

**Exact Localization of Breakpoints of Retinal Pigment Epithelium in Optical Coherence Tomography of Optic Nerve Head**

Mokhtary, Marzieh *(Isfahan Univ. of Medical Sciences)*; Rabbani, Hossein* *(Isfahan Univ. of Medical Sciences)*; Mehri Dehnavi, Alireza *(Isfahan Univ. of Medical Sciences, School of Advanced Techn)*; Kafieh, Rahele *(Isfahan Univ. of Medical Sciences)*

**16:16-16:18**  WeCT14-02.4

**The Analysis of Eye Blinking Pattern using High-Frame-Rate Camera**

Lee, Woon-Hee *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*; Hwang, Jeong Min *(Seoul National University School of Medicine)*

**16:18-16:20**  WeCT14-02.5

**Blood Oxygenation Changes Resulting from Subthreshold High Frequency Repetitive Transcranial Magnetic Stimulation**

Li, Rihui *(Year)*; Wang, Chushan *(Guangdong Provincial Work-injury Rehabilitation Hospital)*; Huang, Kairong *(Guangdong Provincial Work-injury Rehabilitation Hospital)*; Shi, Zhixi *(Guangdong Provincial Work-injury Rehabilitation Hospital)*; Wang, Jun *(Guangdong Provincial Work-injury Rehabilitation Hospital)*; Zhang, Yingchun* *(University of Houston)*

**16:20-16:22**  WeCT14-02.6

**Recognition of Protozoan Parasites from Microscopic Images: Eimeria Species in Chickens and Rabbits as a Case Study**

Abdalla, Mohamed A E *(Northumbria University)*; Seker, Huseyin* *(The University of Northumbria at Newcastle)*

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**WeCT14-03:** 16:10-17:10  Schaldach Room
**Electrical Impedance Imaging** (Poster Session)

**16:10-16:12**  WeCT14-03.1

**Low-Frequency Electrical Conductivity Images of Liver Tissue Damage: in Vivo Animal Cirrhosis Model**

Choi, Bup Kyung *(Kyung Hee University)*; Katoch, Nitish *(Kyung Hee University)*; Sajib, Saurav Z K *(Kyung Hee University)*; Kim, Hyung Joong *(Kyung Hee University)*; Kwon, Ohin *(Konkuk University)*; Woo, Eung Je* *(Kyung Hee University)*

**16:12-16:14**  WeCT14-03.2

**Bio-Admittance Imaging on Acupuncture Points during Cold and Heat Stimulation**

Kim, Jungyoon* *(Korea Institute of Oriental Medicine)*; Cho, Jung-Hee *(Korea Institute of Oriental Medicine)*; Lee, Sanghun *(Korea Institute of Oriental Medicine)*; Kim, Jaeuk U *(Korean Institute of Oriental Medicine)*

**16:14-16:16**  WeCT14-03.3

**Development of Active Electrode Belt for Multi-Channel Electrical Impedance Tomography in Thorax**

Park, Jun Hwan *(Kyung Hee University)*; Oh, Tong In *(Kyunghee University)*; Woo, Eung Je* *(Kyung Hee University)*

**16:16-16:18**  WeCT14-03.4

**Development of Multi-Modal Sensor Module for Cardiac Function Measurement Operating with the Real-Time Electrical Impedance Tomography**

Choi, Hyun Tae *(Kyung Hee University)*; Park, Jun Hwan *(Kyung Hee University)*; Oh, Tong In* *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*

**16:18-16:20**  WeCT14-03.5

**Detection of Upper Airway Obstruction using Electrical Impedance Tomography**

Kim, Young Eun *(Kyung Hee University)*; Kim, Sang-Wook *(Gyeongsang National University)*; Oh, Tong In* *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*

**16:20-16:22**  WeCT14-03.6

**Monitoring of Lung Volume Recruitment in VILI Model using EIT System**

Kim, Young-Bok *(Kyung-Hee Univ, IIRC)*; Jang, Geuk Young *(Dept. of Biomedical Engineering, Graduate School, Kyung Hee)*; Lee, Minhyoung *(Kyunghee Univ., Samsung Electronics)*; Oh, Tong In* *(Kyunghee Univ.)*; Woo, Eung Je *(Kyung Hee Univ.)*

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**WeCT14-04:** 16:10-17:10  Schaldach Room
**Infra-Red Imaging** (Poster Session)

**16:10-16:12**  WeCT14-04.1

**A Dual-Spectrum Infrared Imaging Approach for Detection of Breast Cancer based on Single Visit**

Yang, Ai-Su* *(National Taiwan University)*; Lin, Ruo Jhen *(National Taiwan University)*; Chang, Yeun-Chung *(Depts of Medical Imaging National Taiwan University Hospit)*; Chen, Chung-Ming *(National Taiwan University)*

**16:12-16:14**  WeCT14-04.2

**Active Thermal Infrared Imaging for Label-Free Tumor Detection**

Oh, Gyungseok Oh *(Gwangju Institute of Science and Technology)*; Chung, Euiheon* *(Gwangju Institute of Science and Technology)*

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**WeCT14-05:** 16:10-17:10  Schaldach Room
**MR Molecular Imaging** (Poster Session)

**16:10-16:12**  WeCT14-05.1

**An Automated Single-Scan Z-Spectrum Analysis Method for Amide Proton Transfer Imaging**

Son, Jong Bum *(The University of Texas MD Anderson Cancer Center)*; Rauch, Gaiane Margishvili *(The University of Texas MD Anderson Cancer Center)*; Hwang, Ken-Pin *(The University of Texas M.D. Anderson Cancer Center)*; Ma, Jingfei* *(University of Texas MD Anderson Cancer Center)*

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**WeCT14-06:** 16:10-17:10  Schaldach Room
**Multimodal Image Fusion** (Poster Session)

**16:10-16:12**  WeCT14-06.1

**Development of High-Resolution Magnetic Particle Imaging System for Small Animal Experiments**

Murase, Kenya* *(Osaka University)*

**16:12-16:14**  WeCT14-06.2

**Photoacoustic, Ultrasound, and Magnetic Resonance Fusion Imaging**

Kim, Jeesu *(POSTECH)*; Park, Sara *(Pohang Univ., of Science & Tech.)*; Kim, Chulhong* *(Pohang Univ., of Science & Tech.)*

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**WeCT14-07:** 16:10-17:10  Schaldach Room
**Multimodal Imaging** (Poster Session)

**16:10-16:12**  WeCT14-07.1

**Comparison of Volume and Cortical Surface-Based Standardized Uptake Value Ratio of 18F-Fludeoxyglucose PET**

Kim, Seonjik *(Catholic Univ. of Daegu)*; Sin, In-Tae *(Catholic Univ. of Daegu)*; Yoon, Uicheul* *(Catholic Univ. of Daegu)*

**16:12-16:14**  WeCT14-07.2

**The Relation between Rhythmical Brain Electrical Activity and Hemodynamics Studied by EEG and fNIRS**

Lachert, Piotr* *(Nalecz Institute of Biocybernetics and Biomedical Engr. Po)*; Janusek, Dariusz *(Inst of Biocybernetics & Biomed Engr)*; Pulawski, Przemyslaw *(Nalecz Institute of Biocybernetics and Biomedical Engr. Po)*; Milej, Daniel *(Nalecz Institute of Biocybernetics and Biomedical Engr. PA)*; Sawosz, Piotr *(Institute of Biocyberentics and Biomedical Engr.)*; Kacprzak, Michal *(Institute of Biocybernetics and Biomedical Engr.)*; Cieslak-Blinowska, Katarzyna *(Warsaw Univ.)*

**16:14-16:16**            WeCT14-07.3

**Single Laser Pulse Induced Dual Nonlinear Photoacoustic Signals**

Gao, Fei* *(Shanghai Tech Univ.)*; Feng, Xiaohua *(Nanyang Technological Univ.)*; Zhang, Ruochong *(Nanyang Tech. Univ.)*; Liu, Siyu *(Nanyang Tech. Univ.)*; Ding, Ran *(Nanyang Tech. Univ.)*; Zheng, Yuanjin *(Nanyang Tech. Univ.)*

**16:16-16:18**            WeCT14-07.4

**in Vivo Photoacoustic Imaging and Multiplexed Identification of Surface-Enhanced Raman Scattering using Dual Modal Nanoprobe**

Lee, Seunghyun *(Pohang University of Science and Technology (POSTECH))*; Kim, Chulhong* *(Pohang University of Science and Technology)*

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**WeCT15-01:** 16:10-17:10            Webster Room
**Respiratory Systems I** (Poster Session)

**16:10-16:12**            WeCT15-01.1

**Development and Validation of a Computational Simulator for Pediatric Acute Respiratory Distress Syndrome Patients**

Saffaran, Sina *(The University of Warwick)*; Das, Anup *(University of Warwick)*; Hardman, Jonathan G. *(University of Nottingham)*; Yehya, Nadir *(Children's Hospital of Philadelphia)*; Bates, Declan Gerard* *(University of Warwick)*

**16:12-16:14**            WeCT15-01.2

**Nonparametric Modelling of VO2 Response to Exercise**

Ye, Lin* *(University of Technology, Sydney (UTS))*; Argha, Ahmadreza *(University of New South Wales)*; Celler, Branko George *(University of New South Wales)*; Zhang, Yi *(University of Electronic Science and Technology of China)*; Nguyen, Hung T. *(University of Technology, Sydney)*; Su, Steven Weidong *(University of Technology, Sydney)*

**16:14-16:16**            WeCT15-01.3

**Development of a Real-Time Breathing-Rate Monitor using Difference Operation Method and Adaptive Windowing on ECG Signal**

Singh, Rahul Kumar* *(IIT Kharagpur)*; Negi, Shubham *(IIT Kharagpur)*; Chandrika Sreekantan, Anoop *(Indian Institute of Space Science and Technology Trivandrum)*

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**WeCT15-02:** 16:10-17:10            Webster Room
**Sleep Apnea I** (Poster Session)

**16:10-16:12**            WeCT15-02.1

**Monitoring of Nocturnal Central Sleep Apnea in Heart Failure Patients using Noncontact Respiratory Differences**

Armitstead, Jeffrey Peter* *(Res Med Ltd., University of Sydney)*; Khushaba, Rami N. *(University of Technology, Sydney (UTS))*; Schindhelm, Klaus *(University of New South Wales)*

**16:12-16:14**            WeCT15-02.2

**Relationship between Heart Rate Excursion and Apnea Duration in Patients with Obstructive Sleep Apnea**

Solà-Soler, Jordi* *(Universitat Politècnica de Catalunya)*; Giraldo, Beatriz *(Universitat Poiltècnica de Catalunya)*; Fiz Fernandez, José Antonio *(Navarra Hospital)*; Jané, Raimon *(Institute for Bioengineering de Catalunya (IBEC))*

**16:14-16:16**            WeCT15-02.3

**Characterization of a Tooth Microphone Coupled to an Oral Appliance Device: A New System for Monitoring OSA Patients**

Castillo, Yolanda *(Institute for Bioengineering of Catalonia (IBEC))*; Blanco-Almazán, Dolores *(Institute for Bioengineering of Catalonia)*; Whitney, James *(Morgan State University)*; Mersky, Barry *(Audiodontics)*; Jané, Raimon* *(Institute for Bioengineering de Catalunya (IBEC))*

**16:16-16:18**            WeCT15-02.4

**Characterization of Microphones for Snoring and Breathing Events Analysis in Mhealth**

Castillo, Yolanda *(Institute for Bioengineering of Catalonia (IBEC))*; Cámara, Miguel Ángel *(Institute for Bioengineering of Catalonia)*; Blanco-Almazán, Dolores *(Institute for Bioengineering of Catalonia)*; Jané, Raimon* *(Institute for Bioengineering de Catalunya (IBEC))*

**16:18-16:20**            WeCT15-02.5

**Sleep Apnoea Diagnosis using Respiratory Effort-Based Signals – A Comparative Study**

Sadr, Nadi* *(University of Sydney)*; Jayawardhana, Madhuka *(University of Sydney)*; de Chazal, Philip *(University of Sydney)*

**16:20-16:22**            WeCT15-02.6

**Mhealth Tools for Monitoring Obstructive Sleep Apnea Patients at Home: Proof-of-Concept**

Cámara, Miguel Ángel *(Inst. for Bioengineering of Catalonia)*; Castillo Escario, Yolanda *(Inst. for Bioengineering of Catalonia (IBEC))*; Blanco-Almazán, Dolores *(Inst. for Bioengineering of Catalonia)*; Estrada, Luis *(Inst. for Bioengineering de Catalunya)*; Jané, Raimon* *(Inst. for Bioengineering de Catalunya (IBEC))*

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**WeCT15-03:** 16:10-17:10            Webster Room
**Cardiovascular and Respiratory Signal Processing – Heart Rate and Blood Pressure Variability** (Poster Session)

**16:10-16:12**            WeCT15-03.1

**Unconstrained Pulse Transit Time (PTT) Estimation using Z-Axis Ballistocardiogram and Photoplethysmogram**

Heo, Jeong *(Seoul National Univ., Interdisciplinary Program for Bioengi)*; Park, Kwang S.* *(Seoul National Univ.)*

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**WeCT15-04:** 16:10-17:10            Webster Room
**Cardiovascular and Respiratory Signal Processing – Non-Linear Cardiovascular or Cardiorespiratory Relations** (Poster Session)

**16:10-16:12**            WeCT15-04.1

**Phonocardiography based Method to Detect Fetal Breathing Movements**

Goda, Márton Áron* *(Pázmány Péter Catholic University, Faculty of Information Techno)*; Kovács, Ferenc *(Pázmány Péter Catholic University, Faculty of Information)*

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**WeCT15-05:** 16:10-17:10            Webster Room
**Cardiovascular and Respiratory Signal Processing – Pulse Transit Time** (Poster Session)

**16:10-16:12**            WeCT15-05.1

**The Effect of Peak Detection Methods on Measuring Pulse Transit Time**

Maeda, Yuka* *(University of Tsukuba)*; Sekine, Masaki *(Osaka Electro-Communication University)*; Tamura, Toshiyo *(Waseda University)*; Mizutani, Koichi *(University of Tsukuba)*

**16:12-16:14**            WeCT15-05.2

**Assessment of a Novel Noninvasive Continuous Blood Pressure Monitoring Method using Gyrocardiography**

Lee, ChangHsuan* *(Chang Gung University)*; Verma, Vijay Kumar *(Chang Gung University)*; Lin, Wen-Yen *(Chang Gung University)*; Lee, Ming-Yih *(Chang Gung University)*

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**WeCT15-06:** 16:10-17:10            Webster Room
**Cardiovascular and Respiratory Signal Processing – Time-Frequency, Time-Scale Analysis of Cardiorespiratory Variability** (Poster Session)

**16:10-16:12**            WeCT15-06.1

**Unconstrained Measurement of Heart Information using Ultra Wide Band Radar**

Kim, Hanbyul *(Seoul National University)*; Koh, Myungjun *(Seoul National University)*; Kim, Hae Sung *(BISWORKS)*; Park, Kwang S.* *(Seoul National University)*

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**WeCT15-07:** 16:10-17:10            Webster Room
**Cardiovascular and Respiratory System Modeling – Blood Flow Models** (Poster Session)

**16:10-16:12**            WeCT15-07.1

**Arterial Fractional-Order Model**

Bahloul, Mohamed A.* *(KAUST)*; Laleg Kirati, Taous Meriem *(King Abdullah University of Science and Technology (KAUST))*

16:12-16:14 WeCT15-07.2
**Computational Model of Human Circulatory System Combined with Respiratory System during Veno-Venous Extra-Corporeal Membrane Oxygenation**
Shin, Dong Ah *(Seoul National University)*;
Lee, Jung Chan\* *(Seoul National University College of Medicine)*;
Kim, Hee Chan *(Seoul National University)*

16:14-16:16 WeCT15-07.3
**Virtual Stenting of Multiple Intracranial Aneurysms Considering Thrombosis Modeling**
Berg, Philipp\* *(University of Magdeburg)*; Engel, Sebastian *(University of Magdeburg)*; Janiga, Gabor *(University of Magdeburg)*; Beuing, Oliver *(University Hospital Magdeburg)*

WeCT15-08**:** 16:10-17:10 Webster Room
**Cardiovascular and Respiratory System Modeling – Cardiac Models** (Poster Session)

16:10-16:12 WeCT15-08.1
**Effect of the Ventricular Myocardium Characteristics on the Distribution of Defibrillation Electric Fields**
Qian, Li *(Fudan Univ.)*; Wang, Jianfei *(Fudan Univ.)*; Jin, Lian *(Fudan Univ.)*; Song, Biao *(Fudan Univ.)*; Wu, X.\* *(Fudan Univ.)*

16:12-16:14 WeCT15-08.2
**Computational Prediction of Cardiac Electromechanical Function in Patients with Myocardial Fibrosis**
Lee, Jiyeong *(Kumoh National Institute of Tech.)*; Marcellinus, Aroli *(Kumoh National Institute of Tech.)*; Park, Jun Ik *(Kumoh National Institute of Tech. (KIT), South Korea)*; Lim, Ki Moo\* *(Kumoh National Institute of Tech.)*

WeCT15-09**:** 16:10-17:10 Webster Room
**Cardiovascular and Respiratory System Modeling – Pulmonary Circulation** (Poster Session)

16:10-16:12 WeCT15-09.1
**Characterization of Micro-Porous Palladium-Nickel Mesh Filter**
Ji, Hyo Chul *(Dongguk University College of Medicine)*; Choi, Kyong-Hoon *(Kwangwoon University)*; Kim, Jae Jong *(Dongguk University College of Medicine)*; Moon, Sang-Hyub *(Dongguk University)*; Chang, Kyung Hwa *(Dongguk University College of Medicine)*; Park, Bong Joo *(Kwangwoon University)*; Nam, Ki Chang\* *(Dongguk University College of Medicine)*

WeCT15-10**:** 16:10-17:10 Webster Room
**Cardiovascular and Respiratory System Modeling – Vascular Mechanics and Hemodynamics** (Poster Session)

16:10-16:12 WeCT15-10.1
**A Stochastic Atherosclerotic Plaque Growth Model**
Foo, Zi Hui *(National University of Singapore)*; Li, Yier *(National University of Singapore)*; Buist, Martin Lindsay\* *(National University of Singapore)*

WeCT15-11**:** 16:10-17:10 Webster Room
**Pulmonary and Critical Care – Cardiopulmonary Resuscitation** (Poster Session)

16:10-16:12 WeCT15-11.1
**Physiological Indicators for Return of Spontaneous Circulation during Cardiopulmonary Resuscitation**
Kim, Heejin *(Seoul National University)*;
Kim, Hee Chan\* *(Seoul National University)*

WeCT15-12**:** 16:10-17:10 Webster Room
**Respiratory Transport, Mechanics and Control – Periodic Breathing** (Poster Session)

16:10-16:12 WeCT15-12.1
**Detection of Respiratory Events and Research on APAP Algorithm of Ventilator**
Zeng, Ling-Zi *(Sun Yat-Sen Univ., Guangzhou, China)*; Luo, Yu-Xi\* *(Sun Yat-Sen Univ.)*; Huang, Shao-Xiong *(School of Eng., Sun Yat-Sen Univ.)*; Liang, Jiu-Xing *(School of Eng., Sun Yat-Sen Univ.)*; Li, Jia-Quan *(School of Eng., Sun Yat-Sen Univ.)*

WeCT15-13**:** 16:10-17:10 Webster Room
**Sleep – Obstructive Sleep Apnea** (Poster Session)

16:10-16:12 WeCT15-13.1
**Model-Based Phenotyping of Obstructive Sleep Apnea in Pediatric Obesity for Personalized Theranostics**
Nava-Guerra, Leonardo\* *(University of Southern California)*;
Khoo, Michael *(University of Southern California)*

16:12-16:14 WeCT15-13.2
**Automatic Detection of Obstructive Sleep Apnea based on Convolution Neural Network**
Urtnasan, Erdenebayar *(Yonsei University)*; Kang, KyuMin *(Yonsei University)*; Lee, Kyoung Joung\* *(Yonsei University)*; Park, Jonguk *(Yonsei University)*

WeCT15-14**:** 16:10-17:10 Webster Room
**Sleep – Sleep Apnea Therapy** (Poster Session)

16:10-16:12 WeCT15-14.1
**ActiveAir™: A Vent for a Smaller PAP Device**
Malouf, Gordon Joseph\* *(Res Med)*; Dantanarayana, Muditha *(Res Med)*; Finch, Charles *(Res Med)*; Cutcliffe, Graham *(Res Med)*

WeCT16-01**:** 16:10-17:10 Rushmer Room
**Clinical Robots** (Poster Session)

16:10-16:12 WeCT16-01.1
**Rapid Manipulation of External Control Capsule Endoscope using Head Mounted Display Interface**
Lee, Seonggeon *(Gachon University)*; Lee, Hanji *(Gachon University)*; Hwang, Youngeun *(Gachon University)*; Kim, Jaeseung *(Gachon University)*; Park, Jongoh *(Chonnam National University)*; Lee, Jong Hee *(Woo Young Medical Co., Ltd.)*; Son, Young Don\* *(Gachon University)*

WeCT16-02**:** 16:10-17:10 Rushmer Room
**Computer-Assisted Surgery** (Poster Session)

16:10-16:12 WeCT16-02.1
**Robot-Assisted Bone Reposition System for Orthognathic Surgery**
Woo, Sang-Yoon *(Seoul Natl. Univ.)*; Kang, Se Ryong *(Seoul Natl. Univ.)*; Lee, Sang Jeong *(Seoul Natl. Univ.)*; Yoo, Ji Yong *(Seoul Natl. Univ.)*; Choi, Min Hyuk *(Seoul Natl. Univ.)*; Yi, WonJin\* *(Seoul Natl. Univ Sch of Dentistry)*

16:12-16:14 WeCT16-02.2
**Implementation of a Microsurgical Injector based on a Distance Feedback using Swept Source Optical Coherence Tomography**
Im, Jintaek *(DGIST)*; Jang, Sunjin *(DGIST)*; Song, Cheol\* *(DGIST)*

16:14-16:16 WeCT16-02.3
**Automatic Control of Steerable Ablation Catheter**
Hu, Zhenkai *(Asan Medical Center)*; Moon, Youngjin *(Asan Medical Center)*; Choi, Jaesoon\* *(Asan Institute for Life Sciences, Asan Medical Center)*

WeCT16-03**:** 16:10-17:10 Rushmer Room
**Image Guided Surgery** (Poster Session)

16:10-16:12 WeCT16-03.1
**Characterization of the Interaction between Ultrasonic Motor and Ultrahigh Field MRI for Safe Interventional Operations**
Shokrollahi, Peyman *(University of Toronto)*; Shokrollahi, Elnaz\* *(University of Toronto)*; Drake, James *(University of Toronto, CIGITI, Hospital for Sick Children)*; Goldenberg, Andrew A. *(University of Toronto)*

16:12-16:14 WeCT16-03.2
**Image Guidance Surgery System for Mandibular Proximal Segment Reposition using Electromagnetic Tracking System**
Lee, Sang Jeong *(Seoul Natl. Univ.)*; Woo, Sang-Yoon *(Seoul Natl. Univ.)*; Yoo, Ji Yong *(Seoul Natl. Univ.)*; Choi, Min Hyuk *(Seoul Natl. Univ.)*; Kang, Se Ryong *(Seoul Natl. Univ.)*; Yi, WonJin\* *(Seoul Natl. Univ Sch of Dentistry)*

**16:14-16:16** WeCT16-03.3

**A Method of Initial Positioning of the Virtual Fibula Model in the Fibula Free Flap Mandible Reconstruction using Image Guided Navigation System**

Yoo, Ji Yong *(Seoul National University)*; Woo, Sang-Yoon *(Seoul National University)*; Lee, Sang Jeong *(Seoul National University)*; Choi, Min Hyuk *(Seoul National University)*; Kang, Se Ryong *(Seoul National University)*; Yi, WonJin* *(Seoul National Univ Sch of Dentistry)*

**16:16-16:18** WeCT16-03.4

**Augmented Reality System with a Simple Interface for Endoscopic Ear Surgery**

Lee, Seongpung *(DGIST)*; Cho, Byunghyun *(Kyushu Univ.)*; Matsumoto, Nozomu *(Kyushu Univ.)*; Hashizume, Makoto *(Kyushu Univ.)*; Hong, Jaesung* *(DGIST)*

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**WeCT16-04:** 16:10-17:10 Rushmer Room
**Motion Cancellation in Surgical Robotics** (Poster Session)

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**16:10-16:12** WeCT16-04.1

**Visual Stimuli Modification of Hand Tremor in Virtual Reality for Micro-Surgical Tasks**

Prada, John *(DGIST)*; Park, Taiwoo *(Michigan State University)*; Jang, Sunjin *(DGIST)*; Song, Cheol* *(DGIST)*

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**WeCT16-05:** 16:10-17:10 Rushmer Room
**New Technologies and Methodologies in Medical Robotics** (Poster Session)

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**16:10-16:12** WeCT16-05.1

**Analysis of Algorithm for Simulated Partial Gravity Condition using a Three Dimensional Clinostat**

Hong, Nhayoung *(Seoul National University)*; Lim, Min Hyuk *(Dept. of Biomedical Engineering, Seoul National University)*; Kim, Yoon Jae *(Seoul National University)*; Kim, Myungjoon *(Interdisciplinary Program in Bioengineering, Seoul National Univ)*; Lee, Chiwon *(Korea Electrotechnology Research Institute)*; Kim, Sungwan* *(Seoul National University)*

**16:12-16:14** WeCT16-05.2

**System Development for in Vivo and in Vitro Organ Elasticity Measurements**

Takano, Noriyuki *(Teikyo Heisei University)*; Kim, Daeyoung *(Teikyo Heisei University)*; Kobayashi, Etsuko* *(The University of Tokyo)*; Kiguchi, Kazuo *(Kyushu University)*; Sakuma, Ichiro *(The University of Tokyo)*

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**WeCT16-06:** 16:10-17:10 Rushmer Room
**Prosthetics – Modeling and Simulation in Biomechanics** (Poster Session)

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**16:10-16:12** WeCT16-06.1

**Study on Control of Multiple Robots in Wire-Driven Surgery**

Seo, Sangbo *(Gacheon)*; Cho, Yun Sung *(Gachon University Medical Campus)*; Choi, Han-Sol *(Gachon University)*; Kim, Kwang Gi* *(Gachon University)*

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**WeCT16-07:** 16:10-17:10 Rushmer Room
**Robot-Aided Surgery – Remote Surgery Systems / Telesurgery** (Poster Session)

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**16:10-16:12** WeCT16-07.1

**Tension Measurement and Physical Compensation System Design for Wire-Driven Surgical Robots**

Cho, Yun Sung *(Gachon Univ. Medical Campus)*; Choi, Han-Sol *(Gachon Univ.)*; Kim, Kwang Gi* *(Gachon Univ.)*

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**WeCT16-08:** 16:10-17:10 Rushmer Room
**Robotic Prosthetics** (Poster Session)

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**16:10-16:12** WeCT16-08.1

**Artificial Ligament-Joint Design for a Bioinspired Hand**

Kim, Sang-Hun *(Seoul National Univ.)*; Yun, Sung-Sik *(Seoul National Univ.)*; Cho, Kyu-Jin* *(Seoul National Univ.)*

**16:12-16:14** WeCT16-08.2

**Design of the Regression Model for Grasping Pattern in the Reaching Phase of Myoelectric Prosthetic Hand**

Cho, Woorim *(Handong)*; Noh, Jiho *(Handong)*; Kim, Jaehyo* *(Handong Global University)*

**16:14-16:16** WeCT16-08.3

**A Novel Practical Approach to Prosthetic Control of Continuous Multi-Fingered Kinematics with a Low-Cost Wearable sEMG Device**

Shibata, Tsuyoshi* *(Kyushu Institute of Technology)*; Shibata, Tomohiro *(Kyushu Institute of Technology)*

**16:16-16:18** WeCT16-08.4

**Prosthetic Hand Wrist Connector Reliability Enhancement by Strongly Coupled Wireless Energy Transfer**

Germany, Enrique I.* *(University of Concepcion)*; Saavedra, Francisco *(University of Concepcion)*; Gomez, Britam *(University of Concepcion)*; Pino, Esteban J *(Universidad de Concepcion)*; Aqueveque, Pablo *(University of Concepcion)*

**16:18-16:20** WeCT16-08.5

**Fusion of Depth Sensing, Kinetics and Kinematics for Intent Prediction of Lower Limb Prostheses**

Krausz, Nili Eliana* *(Northwestern University)*; Hargrove, Levi *(Rehabilitation Institute of Chicago)*

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**WeCT16-09:** 16:10-17:10 Rushmer Room
**Surgical Robotics** (Poster Session)

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**16:10-16:12** WeCT16-09.1

**Spherical-Coordinate Manipulator with Circular Telescopic Rail Driven by Rapson's Slider for Laparoscopic Surgery**

Han, SeungSeong* *(Osaka Institute of Technology)*; Mizobuchi, Fumiya *(Osaka Institute of Technology)*; Kawai, Toshikazu *(Osaka Institute of Technology)*; Nishikawa, Atsushi *(Shinshu Univ.)*; Nishizawa, Yuji *(Dept. of Gastroenterological Surgery, Faculty of Medicine,)*; Nakamura, Tatsuo *(Kyoto Univ.)*

**16:12-16:14** WeCT16-09.2

**Locally Operated Master-Slave Control System with Mechanically Separable Master Device for Laparoscopic Forceps Manipulator**

Kobayashi, Hiroyuki* *(Osaka Institute of Technology)*; Kawai, Toshikazu *(Osaka Institute of Technology)*; Nishikawa, Atsushi *(Shinshu University)*; Horise, Yuki *(Tokyo Women's Medical University)*; Masamune, Ken *(The University of Tokyo)*

**16:14-16:16** WeCT16-09.3

**Development of Surgical Device for Closed Reduction of Facial Bone Fracture**

Lee, Hoyul *(Asan Medical Center)*; Moon, Youngjin *(Asan Medical Center)*; Jeong, Woo Shik *(Dept. of Plastic & Reconstructive Surgery, College of Medic)*; Choi, Jong Woo *(Dept. of Plastic & Reconstructive Surgery, College of Medic)*; Choi, Jaesoon* *(Asan Institute for Life Sciences, Asan Medical Center)*

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**WeCT16-10:** 16:10-17:10 Rushmer Room
**Tactile Displays and Perception** (Poster Session)

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**16:10-16:12** WeCT16-10.1

**Frequency Optimization System for Ultrasound Tactile Stimulation using Stationary Wave**

Choi, Jeongbong *(Hanyang University)*; Cho, Kyeong Won *(Hanyang University)*; Park, Jinoh *(Hanyang University)*; Yook, Sunhyun *(Hanyang University)*; Kim, Sun I. *(Osong Medical Innovation foundation)*; Kim, In-Young *(Hanyang University)*; Jang, DongPyo* *(Hanyang University)*

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**WeCT16-11:** 16:10-17:10 Rushmer Room
**Therapeutic Robotics in Rehabilitation** (Poster Session)

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**16:10-16:12** WeCT16-11.1

**Effect of Short-Term Sling Exercise with Whole Body Vibration Recovery on Heart Rate and Blood of Lactate**

Juhwan, Oh* *(National Chonbuk University)*; Taekyu, Kwon *(National Chonbuk University)*

16:12-16:14                                    WeCT16-11.2
**Air Pocket Gloves for Finger-Based Occupational**
**Therapy of Hemiplegic Patients**
Yoon, Juseon *(Handong University)*; Kim, YoungChan
*(Handong Global University)*; Kim, Mi Ju *(Handong Global*
*University)*; Kim, Jaehyo* *(Handong Global University)*

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WeCT16-13**:** 16:10-17:10                     Rushmer Room
**Wearable Robotic Systems – Orthotics** (Poster Session)

16:10-16:12                                    WeCT16-13.1
**Assistance Effect of a Wearable Hip-Assist Robot**
**during Stair Ascent in Elderly Adults**
Kim, Dong-Seok *(Sungkyunkwan University)*; Lee, Hwang-Jae
*(Samsung Medical Center)*; Lee, Suhyun *(Samsung Medical*
*Center)*; Chang, Won Hyuk *(Samsung Medical Center,*
*Sungkyunkwan University School of Medici)*; Jang, Junwon
*(Samsung Electronics)*; Choi, Byung-Ok *(Sungkyunkwan*
*University School of Medicine)*; Ryu, Gyu Ha* *(Samsung*
*Medical Center)*; Kim, Yun-Hee *(Samsung Medical Center)*

ThAT1: 08:00-09:30        Roentgen Hall
**Brain and Physiological Networks: Methods and Applications** (Invited Session)
**Chair:** Faes, Luca *(University of Trento)*
**Co-Chair:** Ding, Lei *(University of Oklahoma)*

08:00-08:15       ThAT1.1
**Causal Brain-Heart Information Transfer during Visual Emotional Elicitation in Healthy Subjects: Preliminary Evaluations and Future Perspectives**
Faes, Luca *(University of Trento)*; Greco, Alberto *(University of Pisa)*; Lanata', Antonio *(University of Pisa)*; Barbieri, Riccardo *(Politecnico di Milano)*; Scilingo, Enzo Pasquale *(University of Pisa)*; Valenza, Gaetano* *(University of Pisa)*

08:15-08:30       ThAT1.2
**Information Transfer and Information Modification to Identify the Structure of Cardiovascular Networks**
Faes, Luca* *(Univ. of Trento)*; Nollo, Giandomenico *(Univ. of Trento)*; Krohova, Jana *(Comenius Univ. in Bratislava)*; Czippelova, Barbora *(Dept. of Physiology, Comenius Univ., Jessenius Faculty)*; Turianikova, Zuzana *(Dept. of Physiology, Comenius Univ., Jessenius Faculty)*; Javorka, Michal *(Comenius Univ., Jessenius Faculty of Medicine)*

08:45-09:00       ThAT1.4
**Inferring Directed Interactions between Cortical Dipole Activities using Coupled Delay Differential Equations**
Leistritz, Lutz* *(Jena University Hospital, Friedrich Schiller University Jena)*; Huonker, Ralph *(Jena University Hospital)*; Witte, Herbert *(Jena University Hospital Friedrich Schiller University)*; Goetz, Theresa *(Institute of Medical Statistics, Computer Sciences and Documenta)*

09:00-09:15       ThAT1.5
**Signal-Adaptive, Frequency-Selective and Time-Variant Analysis of Interactions between Time Series: Comparison of Linear, Nonlinear, Undirected and Directed Approaches**
Schiecke, Karin* *(Jena Univ. Hospital. Friedrich Schiller Univ. Jena)*; Piper, Diana *(Jena Univ. Hospital, Friedrich Schiller Univ. Jena)*; Pester, Britta *(Jena Univ. Hospital; Friedrich Schiller Univ. Jena)*; Benninger, Franz *(Epilepsy Monitoring Unit, Dept. of Child and Adolescent Neu)*; Feucht, Martha *(Epilepsy Monitoring Unit, Dept. of Child and Adolescent Neu)*; Witte, Herbert *(Jena Univ. Hospital Friedrich Schiller Univ.)*; Leistritz, Lutz *(Jena Univ. Hospital, Friedrich Schiller Univ. Jena)*

09:15-09:30       ThAT1.6
**Probing Electrophysiological Intrinsic Brain Networks through Modeling and Computation**
Ding, Lei* *(Univ. of Oklahoma)*; Yuan, Han *(Univ. of Oklahoma)*

09:15-09:30       ThAT1.7
**Functional Connectivity Analysis of Multiplex Muscle Network across Frequencies**
Kerkman, Jennifer N.* *(Vrije Universiteit Amsterdam)*; Daffertshofer, Andreas *(Vrije Universiteit Amsterdam)*; Gollo, Leonardo *(QIMR Berghofer Medical Research Institute)*; Breakspear, Michael *(QIMR Berghofer Medical Research Institute)*; Boonstra, Tjeerd W. *(University of New South Wales)*

ThAT2: 08:00-09:30        Cho Room
**Biomedical Applications of Terahertz Imaging and Spectroscopy** (Invited Session)
**Chair:** MacPherson, Emma *(Chinese University of Hong Kong)*
**Co-Chair:** Kim, Seongsin M. *(The University of Alabama)*

08:00-08:15       ThAT2.1
**Terahertz in Vivo Imaging of Human Skin**
MacPherson, Emma* *(Chinese University of Hong Kong)*

08:15-08:30       ThAT2.2
**Label-Free Terahertz Reflection Imaging for Detection of Malignant Brain Tumor**
Ji, Young Bin* *(Yonsei University)*

08:30-08:45       ThAT2.3
**Recent Advances in Terahertz Medical Imaging**
Oh, Seung Jae* *(Yonsei University)*

08:45-09:00       ThAT2.4
**Investigation of THz Bio-Metamaterials for Biosensing and Imaging**
Smiley, Brianna *(Univ. of Alabama)*; Park, Seung Jo *(Univ. of Alabama)*; Pal, Sharmistha *(Univ. of Alabama)*; Maleski, Alexander *(Univ. of Alabama)*; Gungordu, M. Zeki *(Univ. of Alabama)*; Mollah, A. Shahab *(Univ. of Alabama)*; Philip, Elizabath *(Univ. of Alabama)*; Kung, Patrick *(Univ. of Alabama)*; Kim, Yonghyun *(Univ. of Alabama)*; Kim, Seongsin M.* *(The Univ. of Alabama)*

ThAT4: 08:00-09:30        Min Room
**New Sensing Techniques I** (Oral Session)
**Chair:** Scilingo, Enzo Pasquale *(University of Pisa)*

08:00-08:15       ThAT4.1
**A New Hand Function Assessment Method using an Infrared Imaging Device**
Fang, Qiang* *(RMIT University)*; Gu, Xudong *(The 2nd hospital of Jiaxing)*

08:15-08:30       ThAT4.2
**Frequency-Range Optimized Preprocessing Methods for Quantitative Analysis of Glucose in Blood Serum from Broadband Dielectric Spectra**
Wang, Rui *(NTT Device Technology Labs)*; Nakamura, Masahito* *(NTT Corp.)*; Tanaka, Yujiro *(NTT Device Technology Labs.)*; Tajima, Takuro *(NTT Device Technology Labs)*

08:30-08:45       ThAT4.3
**Three-Dimensional Electrodes Formation using Liquid Metal in Micro Channels for 3-Axis Capacitive Force Sensor**
Tatsuho, Nagatomo* *(Keio Univ.)*; Miki, Norihisa *(Univ.)*

08:45-09:00       ThAT4.4
**Monitoring Voluntary Blink Magnitude through a Wearable Eye-Tracking System: A Preliminary Study**
Lanata', Antonio *(Univ. of Pisa)*; Guidi, Andrea *(Univ. of Pisa)*; Greco, Alberto *(Univ. of Pisa)*; Valenza, Gaetano *(Univ. of Pisa)*; Scilingo, Enzo Pasquale* *(Univ. of Pisa)*

09:00-09:15       ThAT4.5
**Can Accelerometry Data Improve Estimates of Heart Rate Variability from Wrist PPG Sensors?**
Kos, Maciej Rafal* *(Northeastern Univ.)*; Li, Xuan *(Northeastern Univ.)*; Khaghani-Far, Iman *(Northeastern Univ.)*; Gordon, Christine *(Northeastern Univ.)*; Pavel, Misha *(Northeastern Univ.)*; Jimison, Holly *(Northeastern Univ.)*

09:15-09:30       ThAT4.6
**Flexible Sensor Sheet for Real-Time Pressure Monitoring in Artificial Knee Joint during Total Knee Arthroplasty**
Tanabe, Fumika* *(Osaka Univ.)*; Yoshimoto, Shusuke *(Osaka Univ.)*; Noda, Yuki *(Osaka Univ.)*; Araki, Teppei *(Osaka Univ.)*; Uemura, Takafumi *(Osaka Univ.)*; Takeuchi, Yoshinori *(Osaka Univ.)*; Imai, Masaharu *(Osaka Univ.)*; Sekitani, Tsuyoshi *(Osaka Univ.)*

ThAT5: 08:00-09:30        Lee Room
**Current Advances in Seismocardiography and Ballistocardiography** (Minisymposium)
**Chair:** Tavakolian, Kouhyar *(Assistant Professor)*
**Co-Chair:** Di Rienzo, Marco *(Fondazione Don Carlo Gnocchi)*

08:00-08:15       ThAT5.1
**Detecting Indications of Acute Myocardial Infarction using Smartphone Only Solution**
Koivisto, Tero* *(Univ. of Turku)*; Lahdenoja, Olli *(Technology Research Center, Univ. of Turku)*; Hurnanen, Tero *(Technology Research Center, Univ. of Turku)*; Jafari Tadi, Mojtaba *(Univ. of Turku)*; Lehtonen, Eero Lennart *(Univ. of Turku)*; Vasankari, Tuija *(Heart Center, Turku Univ. Hospital)*; Saraste, Antti *(Heart Center, Turku Univ. Hospital)*; Kiviniemi, Tuomas *(Heart Center, Turku Univ. Hospital)*; Airaksinen, Juhani *(Heart Center, Turku Univ. Hospital)*; Pänkäälä, Mikko *(Univ. of Turku)*

**08:15-08:30**          ThAT5.2

**Wearable Gyrocardiography: Towards Continuous Assessment of Myocardial Contractility and Hemodynamics**
Jafari Tadi, Mojtaba* *(University of Turku)*; Lehtonen, Eero Lennart *(University of Turku)*; Saraste, Antti *(Heart Center, Turku University Hospital)*; Pänkäälä, Mikko *(University of Turku)*; Koivisto, Tero *(University of Turku)*

**08:30-08:45**          ThAT5.3

**Seismocardiogram Features and Ultrasound Counterparts**
Di Rienzo, Marco* *(Fondazione Don Carlo Gnocchi)*; Lombardi, Prospero *(Fondazione Don Carlo Gnocchi ONLUS)*; Racca, Vittorio *(Fondazione Don Carlo Gnocchi ONLUS)*; Peritore, Angelica *(Fondazione Don Carlo Gnocchi ONLUS)*; Pezzano, Antonio *(Fondazione Don Carlo Gnocchi ONLUS)*; Vaini, Emanuele *(Polo Tecnologico, Fondazione Don Carlo Gnocchi)*

**08:45-09:00**          ThAT5.4

**Seismocardiographic Correlations to Age, Gender and BMI**
Sørensen, Kasper* *(Aalborg University)*; Jensen, Ask Schou *(Aalborg University)*; Hansen, John *(Aalborg University)*; Søgaard, Peter *(Aalborg University Hospital)*; Struijk, Johannes *(Aalborg University)*; Schmidt, Samuel Emil *(Aalborg University)*

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**ThAT6:** 08:00-09:30          Zworykin Room
**Biomaterial Cell Interaction and Bioprinting** (Oral Session)

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**08:00-08:15**          ThAT6.1

**Micro-Patterned Films of Bio-Functionalized Conducting Polymers for Cellular Engineering**
Park, SooHyun *(Penn State Univ.)*; Abidian, Mohammad Reza *(Univ. of Houston)*; Majd, Sheereen* *(Univ. of Houston)*

**08:15-08:30**          ThAT6.2

**Visible Light-Based Stereolithography Bioprinting of Cell-Adhesive Gelatin Hydrogels**
Wang, Zongjie *(Univ. of British Columbia)*; Tian, Zhenlin *(Univ. of British Columbia)*; Jin, Xian *(Univ. of British Columbia)*; Holzman, Jonathan *(Univ. of British Columbia)*; Menard, Frederic *(Univ. of British Columbia)*; Kim, Keekyoung* *(Univ. of British Columbia Okanagan Campus)*

**08:30-08:45**          ThAT6.3

**Manual Centrifuge System: Bearing-Based Hand Spinner Made with 3-D Printer**
Yoo, Sunyoung *(Seoul National University)*; Lee, Seung Jae *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

**08:45-09:00**          ThAT6.4

**Directed Cell Migration in Co-Cultures by Topographic Curvature for Heterogeneous Tissue Engineering**
Okutani, Chihiro* *(University of Tokyo)*; Wagatsuma, Akira *(University of Tokyo)*; Mabuchi, Kunihiko *(The University of Tokyo)*; Hoshino, Takayuki *(University of Tokyo)*

**09:00-09:15**          ThAT6.5

**Development of Biomimetic System for Scale Up of Cell Spheroids – Building Blocks for Cell Transplantation**
Baba, Kazutomo* *(University of Tsukuba)*; Sankai, Yoshiyuki *(University of Tsukuba)*

**09:15-09:30**          ThAT6.6

**Enabling 3D Hepatocyte Spheroids for Microphysiometry**
Eggert, Sebastian* *(cellasys GmbH)*; Alexander, Frank *(cellasys GmbH)*; Wiest, Joachim *(cellasys GmbH)*

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**ThAT7:** 08:00-09:30          Herrick Room
**Joint Mechanics** (Oral Session)
**Chair:** Lee, Taeyong *(EWHA Woman's University)*

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**08:00-08:15**          ThAT7.1

**Gender Difference of Ankle Stability in the Sagittal and Frontal Planes**
Lee, Hyunglae* *(Arizona State University)*; Hanzlick, Harrison *(Arizona State University)*

**08:15-08:30**          ThAT7.2

**Effects of Counteracting External Valgus Moment on Lateral Tibial Cartilage Contact Conditions and Tibial Rotation**
Shriram, Duraisamy* *(Singapore University of Technology and Design)*; Parween, Rizuwana *(Singapore University of Technology and Design)*; Lee, Yee Han Dave *(Changi General Hospital Singapore)*; Karupppasamy, Subburaj *(Singapore University of Technology and Design (SUTD))*

**08:30-08:45**          ThAT7.3

**Assessment of 3D Morphological Characteristics of the Shoulder Bones using Statistical Shape Modeling: An Application to Handedness**
Inyang, Adijat Omowumi* *(Univ. of Cape Town)*; Fouefack, Jean-Rassaire *(Univ. of Cape Town)*; Sivarasu, Sudesh *(Univ. of Cape Town)*; Roche, Stephen *(Univ. of Cape Town)*; Borotikar, Bhushan *(IMT Atlantique)*; Burdin, Valerie *(IMT Atlantique/Institut Mines Telecom - INSERM U1101)*; Mutsvangwa, Tinashe Ernest Muzvidzwa *(Univ. of Cape Town)*

**08:45-09:00**          ThAT7.4

**The use of Shear Thickening Polymer as a Hip Protecter**
Lee, Taeyong* *(Ewha Womans University)*; Hwang, Dong-Gyu *(Ewha Womans University)*; Ogihara, Naomichi *(Keio University)*; Ito, Kohta *(Keio University)*

**09:00-09:15**          ThAT7.5

**Risk Estimation for Intervertebral Disc Pressure through Musculoskeletal Joint Reaction Force Simulation**
Imamura, Yumeko* *(The National Institute of Advanced Industrial Science and Techno)*; Ayusawa, Ko *(National Institute of Advanced Industrial Science and Tech.)*; Yoshida, Eiichi *(National Institute of Advanced Industrial Science and Tech.)*

**09:15-09:30**          ThAT7.6

**Subject-Specific Shoulder Muscle Attachment Region Prediction using Statistical Shape Models: A Validity Study**
Salhi, Asma* *(IMT Atlantique)*; Burdin, Valerie *(IMT Atlantique/Institut Mines Telecom - INSERM U1101)*; Mutsvangwa, Tinashe Ernest Muzvidzwa *(University of Cape Town)*; Sivarasu, Sudesh *(University of Cape Town)*; Brochard, Sylvain *(CHRU Brest)*; Borotikar, Bhushan *(IMT Atlantique)*

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**ThAT8:** 08:00-09:30          Schwan Room
**Brain-Computer Interface I** (Oral Session)
**Chair:** Harrer, Stefan *(IBM Research)*

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**08:00-08:15**          ThAT8.1

**Neural Decoding of Attentional Selection in Multi-Speaker Environments without Access to Separated Sources**
O'Sullivan, James* *(Columbia University)*; Chen, Zhuo *(Columbia University)*; Herrero, Jose *(Feinstein Institute for Medical Research)*; Sheth, Sameer *(Columbia University Medical Center)*; McKhann, Guy *(Columbia University Medical Center)*; Mehta, Ashesh *(Feinstein Institute for Medical Research)*; Mesgarani, Nima *(Columbia University)*

**08:15-08:30**          ThAT8.2

**TrueNorth-Enabled Real-Time Classification of EEG Data for Brain-Computer Interfacing**
Kiral-Kornek, Filiz Isabell *(University of Melbourne)*; Mendis, Dulini *(University of Melbourne)*; Nurse, Ewan *(University of Melbourne)*; Mashford, Benjamin Scott *(IBM Research Australia)*; Freestone, Dean Robert *(The University of Melbourne)*; Grayden, David B. *(The University of Melbourne)*; Harrer, Stefan* *(IBM Research)*

**08:30-08:45**          ThAT8.3

**An Eighty-Target High-Speed Chinese BCI Speller**
Han, Chengcheng *(Xi'an Jiaotong University)*; Xu, Guanghua* *(Xi'an Jiaotong University)*; Xie, Jun *(Xi'an Jiaotong University)*; Li, Min *(School of Mechanical Engineering, Xi'an Jiaotong University)*; Zhang, Sicong *(Xi'an Jiaotong University)*; Luo, Ailing *(Xi'an Jiaotong University)*

**08:45-09:00**　　　　　　　　　　　　　　　ThAT8.4

**Cortical Oscillatory Dynamics of Tactile Selective Sensation – For a Novel Type of Somatosensory Brain-Computer Interface**
Yao, Lin* *(University Medical Center Goettingen, Georg-August-University)*; Chen, Mei Lin *(University of Waterloo)*; Sheng, Xinjun *(Shanghai Jiao Tong University)*; Mrachacz-Kersting, Natalie *(Aalborg University)*; Zhu, Xiangyang *(Shanghai Jiao Tong University)*; Farina, Dario *(Bernstein Center for Computational Neuroscience, University Medic)*; Jiang, Ning *(University of Waterloo)*

**09:00-09:15**　　　　　　　　　　　　　　　ThAT8.5

**Dynamic Tracking of Non-Stationarity in Human ECoG Activity**
Yang, Yuxiao* *(Univ. of Southern California)*; Chang, Edward *(UCSF)*; Shanechi, Maryam *(Univ. of Southern California)*

**09:15-09:30**　　　　　　　　　　　　　　　ThAT8.6

**Movement-Related Brain Oscillations Vary with Lesion Location in Severely Paralyzed Chronic Stroke Patients**
Ray, Andreas Markus* *(Tuebingen University)*; López-Larraz, Eduardo *(University of Tübingen)*; da Cruz Figueiredo, Thiago *(University of Tübingen)*; Birbaumer, Niels *(Eberhard-Karls-University)*; Ramos-Murguialday, Ander *(Eberhard Karls University of Tubingen/TECNALIA)*

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**ThAT9: 08:00-09:30**　　　　　　　　　　Plonsey Room
**Challenges in the Restoration of Vision through Retinal Neurostimulation** (Minisymposium)
**Chair:** Weiland, James *(University of Michigan)*
**Co-Chair:** Suaning, Gregg *(The University of Sydney)*

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**08:00-08:15**　　　　　　　　　　　　　　　ThAT9.1

**Cortical Responses Driven by Epi-Retinal Stimulation in Rodent**
Xie, Hui *(City Univ. of Hong Kong)*; Wang, Yi *(City Univ. of Hong Kong)*; Chan, Leanne LH* *(City Univ. of Hong Kong)*

**08:15-08:30**　　　　　　　　　　　　　　　ThAT9.2

**Challenges in Suprachoroidal Retinal Neuroprosthesis**
Suaning, Gregg* *(The University of Sydney)*

**08:30-08:45**　　　　　　　　　　　　　　　ThAT9.3

**Experimental Animal Model for the Evaluation of the Artificial Retina**
Seo, Jong Mo* *(Seoul National Univ., School of Engineering)*; Chung, Hum *(Seoul National Univ. School of Medicine)*; Cho, Bum Joo *(Seoul National Univ. School of Medicine)*

**08:45-09:00**　　　　　　　　　　　　　　　ThAT9.4

**Development of a Second-Generation Device for Suprachoroidal-Transretinal Stimulation**
Kanda, Hiroyuki* *(Osaka Univ.)*; Kamei, Motohiro *(Osaka Univ.)*; Sakaguchi, Hirokazu *(Osaka Univ.)*; Endo, Takao *(Osaka Univ.)*; Hirota, Masakazu *(Osaka Univ.)*; Morimoto, Takeshi *(Osaka Univ.)*; Nishida, Kentaro *(Osaka Univ.)*; Kishima, Haruhiko *(Osaka Univ.)*; Miyoshi, Tomomitsu *(Osaka Univ.)*; Terasawa, Yasuo *(NIDEK Co.)*; Oosawa, Kouji *(Nidek Co., Ltd.)*; Ozawa, Motoki *(Nidek Co., Ltd.)*; Fujikado, Takashi *(Osaka Univ.)*

**09:00-09:15**　　　　　　　　　　　　　　　ThAT9.5

**Strategies to Improve Visual Function for Retinal Prosthesis Patients**
Weiland, James* *(University of Michigan)*

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**ThAT10: 08:00-09:30**　　　　　　　　　Schmitt Room
**General and Theoretical Informatics – Predictive Analytics I** (Oral Session)
**Chair:** Iyer, Ravishankar *(University of Illinois at Urbana-Champaign)*

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**08:00-08:15**　　　　　　　　　　　　　　　ThAT10.1

**Prediction of Adenocarcinoma Development using Game Theory**
Athreya, Arjun* *(Univ. of Illinois at Urbana-Champaign)*; Armstrong, Don *(Univ. of Illinois at Urbana Champaign)*; Gundling, William *(Dept. of Molecular and Integrative Physiology, Univ. o)*; Wildman, Derek *(Univ. of Illinois)*; Kalbarczyk, Zbigniew *(Univ. of Illinois at Urbana-Champaign)*; Iyer, Ravishankar *(Univ. of Illinois at Urbana-Champaign)*

**08:15-08:30**　　　　　　　　　　　　　　　ThAT10.2

**Learning from Different Perspectives: Robust Cardiac Arrest Prediction via Temporal Transfer Learning**
Ho, Joyce C.* *(Emory University)*; Park, Yubin *(The University of Texas at Austin)*

**08:30-08:45**　　　　　　　　　　　　　　　ThAT10.3

**Predictive Modeling for Corrective Maintenance of Imaging Devices from Machine Logs**
Balasheb Patil, Ravindra* *(Philips Research India)*; Patil, Meru *(Philips India Limited)*; Ravi, Vidya *(Philips)*; Naik, Sarif Kumar *(Philips Electronics India Ltd)*

**08:45-09:00**　　　　　　　　　　　　　　　ThAT10.4

**Data-Driven Strategies for Robust Forecast of Continuous Glucose Monitoring Time-Series**
Fiorini, Samuele* *(University of Genoa)*; Martini, Chiara *(University of Genoa)*; Malpassi, Davide *(University of Genoa)*; Cordera, Renzo *(University of Genoa)*; Maggi, Davide *(University of Genoa)*; Verri, Alessandro *(University of Genoa)*; Barla, Annalisa *(University of Genoa)*

**09:00-09:15**　　　　　　　　　　　　　　　ThAT10.5

**Prediction of Temperature Induced Office Worker's Performance during Typing Task using EEG**
Nayak, Tapsya *(Univ. of Texas at San Antonio)*; Zhang, Tinghe *(Univ. of Texas, San Antonio)*; Mao, Zijing *(Univ. of Texas at San Antonio)*; Xu, Xiaojing *(Univ. of Tennessee, Knoxville)*; Pack, Daniel *(Univ. of Tennessee)*; Dong, Bing *(Univ. of Texas, San Antonio)*; Huang, Yufei* *(Univ. of Texas at San Antonio)*

**09:15-09:30**　　　　　　　　　　　　　　　ThAT10.6

**Consensus Motifs as Adaptive and Efficient Predictors for Acute Hypotensive Episodes**
Pathinarupothi, Rahul Krishnan *(Amrita Vishwa Vidyapeetham)*; Rangan, Ekanath* *(Amrita Vishwa Vidyapeetham)*

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**ThAT11: 08:00-09:30**　　　　　　　　Greatbatch Room
**Blood Pressure Monitoring** (Oral Session)
**Chair:** Mukkamala, Ramakrishna *(Michigan State University)*
**Co-Chair:** Sugimachi, Masaru *(Natl Cardio Center Research Inst)*

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**08:00-08:15**　　　　　　　　　　　　　　　ThAT11.1

**Model-Based Estimation of Radial Artery Blood Pressure from Recordings of the Nexfin Monitor**
Imaduddin, Syed *(Massachusetts Institute of Technology)*; Heldt, Thomas* *(Massachusetts Institute of Technology)*

**08:15-08:30**　　　　　　　　　　　　　　　ThAT11.2

**A Simple Method for Reconstruction of Continuous Brachial Artery Pressure from Continuous Digital Artery Pressure in Humans**
Zhang, Pandeng* *(Chinese Academy of Sciences)*; Qiu, Quanli *(SIAT)*; Luo, Ying *(Shenzhen sun yat-sen cardiovascular hospital)*; Zhou, Yanxia *(Shenzhen Municipal Second People's Hospital, Guangdong Pro)*; Liu, Jia *(Chinese Academy of Sciences)*

**08:30-08:45**　　　　　　　　　　　　　　　ThAT11.3

**Measurement of Carotid Blood Pressure and Local Pulse Wave Velocity Changes during Cuff Induced Hyperemia**
PM, Nabeel* *(Indian Institute of Technology Madras)*; Karthik, Srinivasa *(HTIC IIT Madras)*; Joseph, Jayaraj *(HTIC, Indian Institute of Technology Madras)*; Sivaprakasam, Mohanasankar *(Indian Institute of Technology Madras)*

**08:45-09:00**　　　　　　　　　　　　　　　ThAT11.4

**Analysis of a GMR-Based Plethysmograph Transducer and Its Utility for Real-Time Blood Pressure Measurement**
Chugh, Vinit Kumar* *(IIT Kharagpur)*; Kalyan, Kubera *(IIT Kharagpur)*; Chandrika Sreekantan, Anoop *(Indian Institute of Space Science and Tech. Trivandrum)*; Patra, Amit *(Indian Institute of Tech. Kharagpur)*; Negi, Shubham *(IIT Kharagpur)*

**09:00-09:15**　　　　　　　　　　　　　　　ThAT11.5

**Regression Analysis and Transfer Function in Estimating the Parameters of Central Pulse Waves from Brachial Pulse Wave**
Chai, Rui *(Northeastern University)*; Li, Siman *(Northeastern University)*; Xu, Lisheng* *(Northeastern University)*; Yao, Yang *(Northeastern University)*; Hao, Liling *(Northeastern University)*

**09:15-09:30**      ThAT11.6

**Novel Blood Pressure Estimation Method using Single Photoplethysmography Feature**

Chen, Yang *(Harbin Institute of Technology Shenzhen Graduate School)*; Cheng, Shuo *(Harbin Institute of Technology)*; Wang, Tong *(Harbin Institute of Technology, Shenzhen Graduate School)*; Ma, Heather Ting\* *(Harbin Institute of Technology Shenzhen Graduate School)*

**08:00-08:15**      ThAT12.1

**Computational Modeling for Regulatory Science at the FDA**

Iacono, Maria Ida\* *(Food and Drug Administration)*; Rajan, Sunder *(Food and Drug Administration)*; Kainz, Wolfgang *(Food and Drug Administration)*; Lochner, Donna R. *(Food and Drug Administration (FDA))*; Angelone, Leonardo M. *(US Food and Drug Administration, Center for Devices and Radiolog)*

**08:15-08:30**      ThAT12.2

**Application of Realistic Human Head Models for Evaluating induced Electric Fields: A Discussion on Feasible Model Creation, Influential Model Assumptions, and Necessary Degree of Complexity**

Wenger, Cornelia\* *(Novocure GmbH)*; Miranda, Pedro Cavaleiro *(Faculdade de Ciências, Universidade de Lisboa)*

**08:30-08:45**      ThAT12.3

**Neurotrauma Evaluation in a 3D Electro-Mechanical Model of a Nerve Bundle**

Cinelli, Ilaria\* *(NUI of Galway)*; Destrade, Michel *(CNRS / Universite Pierre et Marie Curie)*; Duffy, Maeve *(NUI Galway)*; McHugh, Peter *(NUI of Galway)*

**08:45-09:00**      ThAT12.4

**Subject Specific Bioelectric Head Modeling: Effects of Numerical Method Choice and Clinical Considerations**

Hyde, Damon\* *(Boston Children's Hospital and Harvard Medical School)*; Dannhauer, Moritz *(Univ. of Utah)*; Brooks, Dana *(Northeastern Univ.)*; Warfield, Simon K. *(Harvard Medical School)*

**09:00-09:15**      ThAT12.5

**Evaluating Electric Field Distribution in the Heads of Patients Treated with Tumor Treating Fields using Realistic Human Models Created with a Deformable Template**

Urman, Noa *(Novocure)*; Hershkovich, Hadas Sara *(Novocure Ltd., Haifa, Israel)*; Weinberg, Uri *(Novocure)*; Wenger, Cornelia *(Novocure GmbH)*; Kirson, Eilon David *(Novocure)*; Bomzon, Ze'ev\* *(Novocure)*

**09:15-09:30**      ThAT12.6

**Modeling Fibrous Tissues via Boundary Element Method using a Thin-Wire Approximation: Test Results**

Makarov, Sergey\* *(Electrical and Computer Engineering, Worcester Polytechnic Instit)*; Pascual-Leone, Alvaro *(Harvard Medical School)*; Nummenmaa, Aapo *(Massachusetts General Hospital)*

**08:00-08:15**      ThAT13.1

**Chronic Multi-Region Recordings from the Rat Hippocampus in Vivo with a Flexible Parylene-Based Multi-Electrode Array**

Xu, Huijing\* *(Univ. of Southern California)*; Meng, Ellis *(Univ. of Southern California)*; Berger, Theodore *(Univ. of Southern California)*; Song, Dong *(Univ. of Southern California)*

**08:15-08:30**      ThAT13.2

**Development and Characterization of a Fully Flexible Stimulation System based on Embedded Liquid Metal Channels**

David, Romain\* *(Keio University)*; Miki, Norihisa *(University)*

**08:30-08:45**      ThAT13.3

**Using Impedance to Track Fracture Healing Rates in Mice in Vivo: A Pilot Study**

Lin, Monica\* *(UC Berkeley / UC San Francisco)*; Hu, Diane *(Univ. of California - San Francisco)*; Yang, Frank *(Univ. of California - San Francisco)*; Herfat, Safa *(Univ. of California, San Francisco)*; Bahney, Chelsea *(Univ. of California, San Francisco)*; Marmor, Meir *(Univ. of California, San Francisco)*; Maharbiz, Michel *(Univ. of California, Berkeley)*

**08:45-09:00**      ThAT13.4

**Effect of Temperature Variation on Remote Pressure Readout in Wirelessly Powered Intracranial Pressure Monitoring System**

Khan, Muhammad Waqas Ahmad *(Tampere Univ. of Tech.)*; Rizwan, Muhammad *(Tampere Univ. of Tech., Finland)*; Sydänheimo, Lauri *(Tampere Univ. of Tech.)*; Ratmat-Samii, Yahya *(Univ. of California, Los Angeles)*; Ukkonen, Leena *(Tampere Univ. of Tech.)*; Bjorninen, Toni\* *(Tampere Univ. of Tech.)*

**09:00-09:15**      ThAT13.5

**Implantable Bladder Volume Sensor based on Resistor Ladder Network Composed of Conductive Hydrogel Composite**

Kim, Mi Kyung\* *(Korea Advanced Institute of Science and Tech. (KAIST))*; Kim, Hyojung *(Korea Advanced Institute of Science and Tech.)*; Jung, Yeon Su *(KAIST)*; AlAdem, Kenana *(Khalifa University)*; Bawazir, Sarah *(Khalifa University)*; Stefanini, Cesare *(Scuola Superiore Sant'Anna)*; Lee, Hyunjoo Jenny *(Korea Advanced Institute of Science and Tech. (KAIST))*

**09:15-09:30**      ThAT13.6

**Integrating Coupled Magnetoelastic Sensors onto a Flexible Hernia Mesh for High Dynamic Range Strain Measurements**

Liao, Amy\* *(UC Berkeley)*; Harris, Hobart *(UCSF)*; Maharbiz, Michel *(University of California, Berkeley)*

**08:00-08:15**      ThAT14.1

**Abnormality Detection of Mammograms by Discriminative Dictionary Learning on DSIFT Descriptors**

Tavakoli, Nasrin *(Isfahan Univ. of Technology)*; Karimi, Maryam *(Isfahan Univ. of Technology)*; Nejati, Mansour *(Isfahan Univ. of Technology)*; Karimi, Nader *(Isfahan Univ. of Technology)*; Soroushmehr, S.M.Reza\* *(Univ. of Michigan, Ann Arbor)*; Samavi, Shadrokh *(McMaster Univ.)*; Najarian, Kayvan *(Univ. of Michigan - Ann Arbor)*

**08:15-08:30**      ThAT14.2

**Exudate Detection for Diabetic Retinopathy with Convolutional Neural Networks**

Yu, Shuang *(Commonwealth Scientific and Industrial Research Organization)*; Xiao, Di\* *(Commonwealth Scientific and Industrial Research Organization)*; Kanagasingam, Yogi *(The Australian eHealth Research Centre, Perth, CSIRO.)*

**08:30-08:45**      ThAT14.3

**CEUS-Based Classification of Liver Tumors with Deep Canonical Correlation Analysis and Multi-Kernel Learning**

Lehang, Guo *(Shanghai Tenth People's Hospital)*; Dan, Wang\* *(Shanghai Tenth People's Hospital)*; Huixiong, Xu *(Shanghai Tenth People's Hospital)*; Yiyi, Qian *(Shanghai University)*; Chaofeng, Wang *(Shanghai University)*; Zheng, Xiao *(Shanghai University)*; Zhang, Qi *(Shanghai University)*; Shi, Jun *(Shanghai University)*

**08:45-09:00**      ThAT14.4

**A Multi-View Deep Convolutional Neural Networks for Lung Nodule Segmentation**

Wang, Shuo *(Chinese Academy of Sciences)*; Mu, Zhou *(Stanford Univ.)*; Gevaert, Olivier *(The Stanford Center for Biomedical Informatics Research, Stanfor)*; Tang, Zhenchao *(Shandong Univ., Weihai)*; Dong, Di *(Chinese Academy of Sciences)*; Liu, Zhenyu *(Institute of Automation, Chinese Academy of Sciences)*; Tian, Jie\* *(Chinese Academy of Sciences)*

**09:00-09:15**                                   ThAT14.5
**Surgical-Tools Detection based on Convolutional Neural
Network in Laparoscopic Robot-Assisted Surgery**
Choi, Bareum *(Asan Institute for Life Sciences, Asan Medical
Center)*; Jo, Kyungmin *(Asan Institute for Life Sciences, Asan
Medical Center)*; Choi, Songe *(Asan Institute for Life Sciences,
Asan Medical Center)*; Choi, Jaesoon* *(Asan Institute for Life
Sciences, Asan Medical Center)*

**09:15-09:30**                                   ThAT14.6
**Deep Learning-Based Diabetic Retinopathy
Assessment on Embedded System**
Ardiyanto, Igi* *(Universitas Gadjah Mada)*; Adi Nugroho,
Hanung *(Universitas Gadjah Mada)*; Buana, Ratna Lestari
Budiani *(Universitas Gadjah Mada)*

**Bioengineering Advances in the Diagnosis and
Treatment of Sleep Apnea I** (Minisymposium)
**Chair:** Khoo, Michael *(University of Southern California)*
**Co-Chair:** Penzel, Thomas *(Charite Universitätsmedizin Berlin)*

**08:00-08:15**                                   ThAT15.1
**Development of Methods for Sleep Disordered
Breathing to Identify Phenotypes**
Penzel, Thomas* *(Charite Universitätsmedizin Berlin)*;
Schoebel, Christoph *(Charite Universitaetsmedizin Berlin)*;
Glos, Martin *(Charite-Universitaetsmedizin Berlin)*; Schwarz,
Lisa *(Charite - Universitätsmedizin Berlin)*; Prochnow, Lisa
*(Charite - Universitätsmedizin Berlin)*; Fietze, Ingo *(Charite-
Universitaetsmedizin Berlin)*

**08:15-08:30**                                   ThAT15.2
**ECG Detection and Risk-Stratification of Sleep Apnea by the
Analysis of Cyclic Variation of Heart Rate**
Hayano, Junichiro* *(Nagoya City University)*; Watanabe, Eiichi
*(Fujita Health University)*; Yoshida, Yutaka *(Nagoya City
University Graduate School of Medical Sciences)*; Yuda, Emi
*(Nagoya City University Graduate School of Medical Sciences)*

**08:30-08:45**                                   ThAT15.3
**Analyses of Breathing Pattern during Wakefulness as a
Tool for Identifying OSA Phenotype and for
Predicting the Success of Treatment**
Yamauchi, Motoo* *(Nara Medical University)*

**08:45-09:00**                                   ThAT15.4
**Dynamic Upper Airway MRI during Sleep Onset:
An Experimental Study**
Kim, Yoon-Chul* *(Samsung Medical Center, Sungkyunkwan
Univ. School of Medici)*; Khoo, Michael *(Univ. of Southern
California)*; Nayak, Krishna *(Univ. of Southern California)*

**Signal Processing – Wearable Devices** (Oral Session)
**Chair:** Barbieri, Riccardo *(Politecnico di Milano)*

**08:00-08:15**                                   ThAT17.1
**Remote Gaze Tracking System for 3D Environments**
Liu, Congcong* *(Hong Kong University of Science and
Technology)*; Herrup, Karl *(Hong Kong University of Science
and Technology)*; Shi, Bertram E *(Hong Kong University of
Science and Technology)*

**08:15-08:30**                                   ThAT17.2
**Estimation of Blood Pressure from Non-Invasive Data**
Shukla, Satya Narayan* *(University of Massachusetts Amherst)*

**08:30-08:45**                                   ThAT17.3
**Assessment of Instantaneous Cardiovascular
Dynamics from Video Plethysmography**
Valenza, Gaetano *(Univ. of Pisa)*; Iozzia, Luca *(Politecnico of
Milan)*; Cerina, Luca *(Politecnico of Milan)*; Mainardi, Luca
*(Politecnico di Milano)*; Barbieri, R.* *(Politecnico di Milano)*

**08:45-09:00**                                   ThAT17.4
**Towards VO2 Monitoring: Validation of a
Heart Rate based Algorithm**
Manzoni, Cecilia *(EPFL)*; Carrard, Apolline *(VO2Sport)*;
Fontana, Elisa *(VO2Sport)*; Lemay, Mathieu *(CSEM)*;
Bertschi, Mattia *(CSEM)*; Delgado-Gonzalo, Ricard* *(CSEM)*

**09:00-09:15**                                   ThAT17.5
**A Portable Platform to Collect and Review Behavioral Data
Simultaneously with Neurophysiological Signals**
Jiang, Tianxiao* *(Univ. of Houston)*; Siddiqui, Hasan *(Univ. of
Houston)*; Ray, Shruti *(Univ. of Houston)*; Ince, Nuri Firat *(Univ.
of Houston)*; Ozturk, Musa *(Univ. of Houston)*;
Asman, Priscella *(Univ. of Houston)*

**09:15-09:30**                                   ThAT17.6
**A Simple, Remote, Video based Breathing Monitor**
Regev, Nir* *(Ben-Gurion University of the Negev)*;
Wulich, Dov *(Ben-Gurion University of the Negev)*

**Principal and Independent Component Analysis I** (Oral Session)

**08:00-08:15**                                   ThAT18.1
**On the use of Higher-Order Tensors to Model Muscle Synergies**
Ebied, Ahmed* *(University of Edinburgh)*; Spyrou, Loukianos
*(University of Edinburgh)*; Kinney-Lang, Eli *(University of
Edinburgh)*; Escudero, Javier *(University of Edinburgh)*

**08:15-08:30**                                   ThAT18.2
**Exploring Optimal Myoelectric Feature Indices for Forearm
Control Strategy using Robust Principal Component Analysis**
Kanoga, Suguru* *(National Institute of Advanced Industrial
Science and Tech.)*; Murai, Akihiko *(National Institute of
Advanced Industrial Science and Tech.)*; Tada, Mitsunori
*(National Institute of Advanced Industrial Science and Tech.)*

**08:30-08:45**                                   ThAT18.3
**Coupling Scatter Correction with Bandpass Filtering
for Pre-Processing in the Quantitative Analysis of
Glucose from Near-Infrared Spectra**
Alrezj, Osamah* *(Sheffield University)*; Patchava, Krishna
Chaitanya *(The University of Sheffield)*; Benaissa, Mohammed
*(The University of Sheffield)*; Alshebeili, Saleh *(KSU)*

**08:45-09:00**                                   ThAT18.4
**Modified Thresholding Technique of MMSPCA for Extracting
Respiratory Activity from Short Length PPG Signal**
Motin, Mohammod Abdul *(PhD Student, University of
Melbourne)*; Karmakar, Chandan* *(Deakin University)*;
Palaniswami, Marimuthu *(The University of Melbourne)*

**09:00-09:15**                                   ThAT18.5
**Channels Selection using Independent Component
Analysis and Scalp Map Projection for EEG-Based
Driver Fatigue Classification**
Chai, Rifai* *(Univ. of Tech., Sydney)*; Naik, Ganesh R *(Univ. of
Tech. Sydney)*; Ling, Steve *(Univ. of Tech. Sydney)*; Tran,
Yvonne *(Univ. of Tech., Sydney)*; Craig, Ashley *(The Univ. of
Sydney)*; Nguyen, Hung T. *(Univ. of Tech., Sydney)*

**09:15-09:30**                                   ThAT18.6
**Motion Artifact Reduction in PPG Signals based on
Periodic Component Factorization**
Lo, Po Wen* *(The Chinese University of Hong Kong)*; Li,
Charles X.-T. *(The Chinese University of Hong Kong)*; Wang,
Jiankun *(The Chinese University of Hong Kong)*; Meng, Max Q.-
H. *(The Chinese University of Hong Kong)*

**Neural Hyperscanning: Toward Multiple-Brain Models of
Cognitive Functions** (Minisymposium)
**Chair:** Astolfi, Laura *(University of Rome Sapienza)*
**Co-Chair:** Ding, Mingzhou *(University of Florida)*

**10:50-11:05**                                   ThBT1.1
**Quantifying Brain-to-Brain Synchrony with
Total Interdependence**
Wan, Lu *(Univ. of Florida)*; Ding, Mingzhou* *(Univ. of Florida)*

**July 13 Thursday**

**11:20-11:35**            ThBT1.3

**Linear and Nonlinear Hyperlink Analysis based on Subspace Decomposition and MIC for Two-Person Neuroscience Study**

Zhang, Zong *(Beijing Normal Univ., Key Laboratory of Cognitive Neuroscie)*; Zhao, Yang *(Beijing Normal Univ., Key Laboratory of Cognitive Neuroscie)*; Dai, Ruina *(Key Laboratory of Cognitive Neuroscience and Learning, Beijing No)*; Duan, Lian *(Key Laboratory of Cognitive Neuroscience and Learning, Beijing No)*; Li, Zheng *(Beijing Normal Univ.)*; Zhu, Chaozhe\* *(Key Laboratory of Cognitive Neuroscience and Learning, Beijing No)*; Long, Zhiying *(Beijing Normal Univ.)*

**11:50-12:05**            ThBT1.5

**Hyperscanning: A New Approach to the Study of the Physiological Basis of Human Social Interaction**

Astolfi, Laura\* *(University of Rome Sapienza)*

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**ThBT2:** 10:50-12:20            Cho Room

**Radiation Induced Acoustic Imaging** (Minisymposium)

**Chair:** Min, Jung-Joon *(Chonnam National Univ. Medical School)*

**Co-Chair:** Lee, Changho *(Chonnam National Univ. Medical School)*

**10:50-11:05**            ThBT2.1

**Theranostic with Radiation-Induced Ultrasound Emission (TRUE)**

Xiang, Liangzhong\* *(University of Oklahoma)*

**11:05-11:20**            ThBT2.2

**Targeted Molecular Theranostics using Engineered Microbes**

Min, Jung-Joon\* *(Chonnam National University Medical School)*

**11:20-11:35**            ThBT2.3

**Photoacoustic Imaging with Biodegradable Agents**

Lee, Changho\* *(Chonnam National University Medical School)*; Kim, Chulhong *(Pohang University of Science and Technology)*

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**ThBT3:** 10:50-12:20            Park Room

**X-Ray and CT Imaging I** (Oral Session)

**Chair:** Moratal, David *(Universitat Politècnica de València)*

**10:50-11:05**            ThBT3.1

**Interactive Patient-Specific 3D Approximation of Scapula Bone Shape from 2D X-Ray Images using Landmark-Constrained Statistical Shape Model Fitting**

Mutsvangwa, Tinashe Ernest Muzvidzwa\* *(University of Cape Town)*; Wasswa, William *(Mbarara University of Technology)*; Burdin, Valérie *(Institut Telecom/Telecom Bretagne - INSERM U650)*; Borotikar, Bhushan *(IMT Atlantique)*; Douglas, Tania S *(University of Cape Town)*

**11:05-11:20**            ThBT3.2

**Arytenoid Cartilage Feature Point Detection using Laryngeal 3D CT Images in Parkinson's Disease**

Desai, Nandakishor\* *(University of Melbourne)*; Rao, Aravinda *(The University of Melbourne)*; Palaniswami, Paari *(Monash University)*; Thyagarajan, Dominic *(Monash Medical Centre)*; Palaniswami, Marimuthu *(The University of Melbourne)*

**11:20-11:35**            ThBT3.3

**Multiple Mucociliary Transit Marker Tracking in Synchrotron X-Ray Images using the Global nearest Neighbor Method**

Jung, Hye-Won\* *(UNISA)*; Lee, Ivan *(The Univ. of South Australia)*; Lee, Sang-Heon *(The Univ. of South Australia)*; Parsons, David *(Women's and Children's Hospital)*; Donnelley, Martin *(Univ. of Adelaide, Women's and Children's Hospital)*

**11:35-11:50**            ThBT3.4

**A One-Dimensional Fluid Simulation Method of the Narrow Vessel for the Real-Time Angiography Simulation**

Lee, Jongbeom *(KAIST (Korea Advanced Institute of Science and Technology))*; Kim, Myeongjin *(KAIST (Korea Advanced Institute of Science and Technology))*; Lee, Doo Yong\* *(KAIST)*

**11:50-12:05**            ThBT3.5

**The use of Subject-Specific Finite Element Analysis of L1-L4 Vertebra to Screening Osteoporosis in Postmenopausal Women**

Alacreu, Elena *(Center for Biomaterials and Tissue Engineering, Universitat Poli)*; Arana, Estanislao *(Radiology Dept., Fundación Instituto Valenciano de Oncologí)*; Moratal, David\* *(Universitat Politècnica de València)*

**12:05-12:20**            ThBT3.6

**Environment Effects at Phantom-Based X-Ray Pose Measurements**

Thuerauf, Sabine\* *(fortiss GmbH An-Institut Technische Univ. München Mailing)*; Koerner, Mario *(Siemens Healthcare GmbH)*; Vogt, Florian *(Siemens Healthcare GmbH)*; Hornung, Oliver *(Siemens Healthcare GmbH)*; Nasseri, M. Ali *(Technische Univ. Muenchen)*; Knoll, Alois *(Tech. Univ. Munich)*

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**ThBT4:** 10:50-12:20            Min Room

**New Sensing Techniques II** (Oral Session)

**10:50-11:05**            ThBT4.1

**Development of an Intraluminal Intestinal Photoplethysmography Sensor**

Patel, Zaibaa\* *(City, University of London)*; Thaha, Mohamed *(The Royal London Hospital, Bart's Health NHS Trust)*; Kyriacou, Panayiotis *(City University London)*

**11:05-11:20**            ThBT4.2

**Instrumentation, Electrode Choice and Challenges in Human Skin Memristor Measurement**

Pabst, Oliver\* *(University of Oslo)*; Tronstad, Christian *(Oslo University Hospital)*; Martinsen, Ørjan G *(University of Oslo)*

**11:20-11:35**            ThBT4.3

**Flexible Organic TFT Bio-Signal Amplifier using Reliable Chip Component Assembly Process with Conductive Adhesive**

Yoshimoto, Shusuke\* *(Osaka Univ.)*; Uemura, Takafumi *(Osaka Univ.)*; Akiyama, Mihoko *(Osaka Univ.)*; Ihara, Yoshihiro *(Research & Development Division, Shinko Electric Industries Co.,)*; Otake, Satoshi *(Research & Development Division, Shinko Electric Industries Co.,)*; Fujii, Tomoharu *(Research & Development Division, Shinko Electric Industries Co.,)*; Araki, Teppei *(Osaka Univ.)*; Sekitani, Tsuyoshi *(Osaka Univ.)*

**11:35-11:50**            ThBT4.4

**Continuous Systolic and Diastolic Blood Pressure Estimation Utilizing Long Short-Term Memory Network**

Lo, Po Wen\* *(The Chinese University of Hong Kong)*; Li, Charles X.-T. *(The Chinese University of Hong Kong)*; Wang, Jiankun *(The Chinese University of Hong Kong)*; Cheng, Jiyu *(The Chinese University of HongKong)*; Meng, Max Q.-H. *(The Chinese University of Hong Kong)*

**11:50-12:05**            ThBT4.5

**An in Vivo MEMS Sensor System for Percutaneous Measurement of Urinary Bladder**

Clausen, Ingelin\* *(SINTEF Digital, Norway)*; W Tvedt, Lars Geir *(SINTEF ICT, Norway)*; Hellandsvik, Are *(SINTEF Digital)*; Rognlien, Dag Kristian *(SINTEF Digital)*; Glott, Thomas *(Sunnaas Rehabilitation Hospital)*

**12:05-12:20**            ThBT4.6

**Performance Assessment of Dry Electrodes for Wearable Long Term Cardiac Rhythm Monitoring: Skin-Electrode Impedance Spectroscopy**

Bosnjak, Antonio *(Univ. de Carabobo.)*; Kennedy, Alan *(Intelesens)*; Linares, Pedro *(Univ. of Carabobo)*; Borges, Maira *(Univ. de Carabobo)*; McLaughlin, James *(Univ. of Ulster)*; Escalona, Omar Jacinto\* *(Univ. of Ulster)*

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**ThBT5:** 10:50-12:20            Lee Room

**Emerging Technologies for Cuffless Unobtrusive Blood Pressure Monitoring: Celebration of 200th Birth Anniversary of Carl Ludwig** (Minisymposium)

**Chair:** Carey, Carole C. *(Former U.S. Food and Drug Administration)*

**Co-Chair:** Ding, Xiao-Rong *(The Chinese University of Hong Kong)*

**10:50-11:05**            ThBT5.1

**Measurement and Analysis of Daily Blood Pressure over a Two-Year Period**

Chen, Wenxi\* *(Univ. of Aizu)*; Tamura, Toshiyo *(Waseda Univ.)*

**11:05-11:20**            ThBT5.2

**Method for Wearable Central Blood Pressure Monitoring and Its Multi-Signal Conditioning Approach**

Fierro, Germán *(Univ. de la Republica)*; Silveira, Fernando\* *(Univ. de la Republica)*; Armentano, Ricardo Luis *(Republic Univ.)*

**11:20-11:35**　　　　　　　　　　　　　　　　　　　　　ThBT5.3
**A Novel Deep Learning based Approach for**
**Continuous Blood Pressure Estimation**

Miao, Fen *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Liu, Xueliang *(Hefei University of Technology)*; Li, Ye\* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*

**11:35-11:50**　　　　　　　　　　　　　　　　　　　　　ThBT5.4
**Flexible Electronics for Cuffless Blood Pressure Measurements**

Zhao, Ni\* *(The Chinese University of Hong Kong)*

**11:50-12:05**　　　　　　　　　　　　　　　　　　　　　ThBT5.5
**Unobtrusive Sensing of Intra-Aneurysm Sac Pressure in**
**Patients after Endovascular Aneurysm Repair**

Poon, Carmen C. Y.\* *(The Chinese University of Hong Kong)*; Zheng, Yali *(The Chinese University of Hong Kong)*; Lau, James Y. W. *(The Chinese University of Hong Kong)*

**12:05-12:20**　　　　　　　　　　　　　　　　　　　　　ThBT5.6
**A Systematic Classification of Cuffless Blood Pressure**
**Monitoring Techniques: The Three-Layer Framework**

Sola, Josep *(CSEM - Centre Suisse d'Electronique et Microtechnique)*; Proença, Martin *(Swiss Center for Electronics and Microtechnology (CSEM))*; Braun, Fabian *(CSEM SA)*; Delgado-Gonzalo, Ricard\* *(CSEM)*; Ferrario, Damien *(CSEM)*; Renevey, Philippe *(CSEM)*; Verjus, Christophe *(CSEM)*; Lemay, Mathieu *(CSEM)*; Chételat, Olivier *(CSEM)*; Bertschi, Mattia *(CSEM)*; Krauss, Jens *(CSEM)*

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**ThBT6:** 10:50-12:20　　　　　　　　　　　　　　　Zworykin Room
**Biomaterials and Patterning I** (Oral Session)

**10:50-11:05**　　　　　　　　　　　　　　　　　　　　　ThBT6.1
**Protein Patterning using Germanium as a Sacrificial Layer**

Lu, Bochao\* *(University of California Berkeley)*; Maharbiz, Michel *(University of California, Berkeley)*

**11:05-11:20**　　　　　　　　　　　　　　　　　　　　　ThBT6.2
**Conducting Polymer Microcontainers for**
**Biomedical Applications**

Antensteiner, Martin *(University of Houston)*; Khorrami, Milad *(University of Houston)*; Fallahianbijan, Fatemeh *(Penn State University)*; Borhan, Ali *(The Pennsylvania State University)*; Abidian, Mohammad Reza\* *(University of Houston)*

**11:20-11:35**　　　　　　　　　　　　　　　　　　　　　ThBT6.3
**Mechanical Properties of Triply Periodic Minimal**
**Surface Structures Mimicking the Microstructure**
**of Woodpecker's Cranial Bone**

Ni, Yikun *(Beihang University)*; Wang, Lizhen *(Beihang University)*; Fan, Yubo\* *(Beihang University)*

**11:35-11:50**　　　　　　　　　　　　　　　　　　　　　ThBT6.4
**Self-Spreading Method for Forming Lipid Bilayer on a Patterned**
**Agarose Gel: Toward Precise Lipid Bilayer Patterning**

Shimba, Kenta\* *(Tokyo Institute of Technology)*; Shoji, Kazuma *(Tokyo Institute of Technology)*; Miyamoto, Yoshitaka *(Nagoya University)*; Yagi, Tohru *(Tokyo Institute of Technology)*

**11:50-12:05**　　　　　　　　　　　　　　　　　　　　　ThBT6.5
**Tunable Nanostructured Conducting Polymers for**
**Neural Interface Applications**

Abidian, Mohammad Reza\* *(University of Houston)*; Antensteiner, Martin *(University of Houston)*

**12:05-12:20**　　　　　　　　　　　　　　　　　　　　　ThBT6.6
**Simple and Fast Polydimethylsiloxane (PDMS)**
**Patterning using a Cutting Plotter and Vinyl**
**Adhesives to Achieve Etching Results**

Kim, Hyun *(Seoul National University)*; Yoo, Sunyoung *(Seoul National University)*; Kim, Ji Sung *(Seoul National University)*; Wang, Zihuan *(Seoul National University)*; Lee, Woon-Hee *(Seoul National University)*; Koo, Kyoin *(University of Ulsan)*; Seo, Jong Mo\* *(Seoul National University, School of Engineering)*; Cho, Dong Il *(Seoul National University)*

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**ThBT7:** 10:50-12:20　　　　　　　　　　　　　　　　Herrick Room
**Motion Analysis** (Oral Session)
**Chair:** Thomas, Louise *(Simon Fraser University)*

**10:50-11:05**　　　　　　　　　　　　　　　　　　　　　ThBT7.1
**Human Locomotion Analysis: Identifying a Dynamic**
**Mapping between Upper and Lower Limb Joints**
**using the Koopman Operator**

Boudali, A. Mounir\* *(The University of Sydney)*; Sinclair, Peter James *(The University of Sydney)*; Smith, Richard *(The University of Sydney)*; Manchester, Ian *(Umeå University)*

**11:05-11:20**　　　　　　　　　　　　　　　　　　　　　ThBT7.2
**Fusing Motion-Capture and Inertial Measurements for Improved**
**Joint State Recovery: An Application for Sit-to-Stand Actions**

Matthew, Robert, Peter\* *(UC Berkeley)*; Seko, Sarah *(UC Berkeley)*; Bajcsy, Ruzena *(UC Berkeley, CITRIS)*

**11:20-11:35**　　　　　　　　　　　　　　　　　　　　　ThBT7.3
**Quantifying the Effects of On-the-Fly Changes of Seating**
**Configuration on the Stability of a Manual Wheelchair**

Thomas, Louise\* *(Simon Fraser University)*; Borisoff, Jaimie F. *(British Columbia Institute of Technology)*; Sparrey, Carolyn *(Simon Fraser University)*

**11:35-11:50**　　　　　　　　　　　　　　　　　　　　　ThBT7.4
**Simulation of Oxygen Uptake and Leg Joint Reaction Force**
**during Ergometer Exercise under Altered Gravity**

Tagawa, Yoshihiko *(Kurume Univ.)*; Yamamoto, Naosuke\* *(Kurume Univ.)*; Omoto, Masayuki *(Kurume Univ.)*; Matsuse, Hiroo *(Kurume Univ. Hospital)*; Shiba, Naoto *(Kurume Univ. Hospital)*

**11:50-12:05**　　　　　　　　　　　　　　　　　　　　　ThBT7.5
**Analysis of Gait Pattern during Stair Walk for**
**Improvement of Gait Training Robot**

Park, Sang-Eun *(Biomedical Engineering Research Center, Asan Medical Center)*; Ho, Ye Ji *(the Biomedical Engineering Research Center, Asan Medical Center)*; Moon, Youngjin *(Asan Medical Center)*; Choi, Jaesoon\* *(Asan Institute for Life Sciences, Asan Medical Center)*

**12:05-12:20**　　　　　　　　　　　　　　　　　　　　　ThBT7.6
**Body Pose Estimation in Depth Images for**
**Infant Motion Analysis**

Hesse, Nikolas\* *(Fraunhofer Institute of Optronics, System Technologies and Image)*; Schröder, A. Sebastian *(Dept. of Paediatric Neurology and Dev. Medicine, D)*; Müller-Felber, Wolfgang *(Dept. of Paediatric Neurology and Developmental Medicine, D)*; Bodensteiner, Christoph *(Fraunhofer Institute of Optronics, System Technologies and Image)*; Arens, Michael *(Fraunhofer Institute of Optronics, System Technologies and Image)*; Hofmann, Ulrich G. *(University of Freiburg)*

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**ThBT8:** 10:50-12:20　　　　　　　　　　　　　　　　Schwan Room
**Brain-Computer Interface II** (Oral Session)

**10:50-11:05**　　　　　　　　　　　　　　　　　　　　　ThBT8.1
**Electrocortical Amplitude Modulations of Human**
**Level-Ground, Slope, and Stair Walking**

Luu, Trieu Phat\* *(University of Houston)*; Brantley, Justin *(University of Houston)*; Zhu, Fangshi *(University of Houston)*; Contreras-Vidal, José *(University of Houston)*

**11:05-11:20**　　　　　　　　　　　　　　　　　　　　　ThBT8.2
**EEG-Guided Robotic Mirror Therapy System for**
**Lower Limb Rehabilitation**

Marghi, Yeganeh M.\* *(Northeastern Univ.)*; Farjadian, Amir Bahador *(Northeastern Univ.)*; Yen, Sheng-che *(Northeastern Univ.)*; Erdogmus, Deniz *(Northeastern Univ.)*

**11:20-11:35**　　　　　　　　　　　　　　　　　　　　　ThBT8.3
**Boosting Performance in Brain-Machine Interface by**
**Classifier-Level Fusion based on Accumulative Training**
**Models from Multi-Day Data**

Yang, Huijuan\* *(Institute for Infocomm Research, Agency for Science, Tech.)*; Libedinsky, Camilo *(A\*STAR)*; Guan, Cuntai *(Nanyang Tech. Univ.)*; Ang, Kai Keng *(Institute for Infocomm Research)*; So, Rosa *(Institute for Infocomm Research)*

**11:35-11:50**               **ThBT8.4**
**Stop State Classification in Intracortial Brain-Machine-Interface**
Koh, Tze Hui *(Institute for Infocomm Research)*; Libedinsky, Camilo *(A*STAR)*; Guan, Cuntai *(Nanyang Technological University)*; Ang, Kai Keng *(Institute for Infocomm Research)*; So, Rosa* *(Institute for Infocomm Research)*

**11:50-12:05**               **ThBT8.5**
**A Frequency Recognition Method based on Multitaper Spectral Analysis and SNR Estimation for SSVEP-Based Brain–computer Interface**
Yang, Chen *(Tsinghua University)*; Xu, Han *(Tsinghua University)*; Wang, Yijun *(Institute of Semiconductors, Chinese Academy of Sciences)*; Gao, Xiaorong* *(Tsinghua University)*

**12:05-12:20**               **ThBT8.6**
**Learning to Control an SSVEP-Based BCI Speller in Naïve Subjects**
Zhihua Tang, Zhihua *(Hebei University of Technology)*; Wang, Yijun* *(Institute of Semiconductors, Chinese Academy of Sciences)*; Dong, Guoya *(Hebei University of Technology)*; Pei, Weihua *(Institute of semiconductors, CAS)*; Chen, Hongda *(institute of semiconductors, CAS)*

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**ThBT9:** 10:50-12:20           Plonsey Room
**Neural Stimulation I** (Oral Session)
**Chair:** Jun, Sung Chan *(Gwangju Institute of Science and Tech.)*
**Co-Chair:** Zhang, Cheng *(Chinese Academy of Sciences, Beijing)*

**10:50-11:05**               **ThBT9.1**
**A 64-Channels Neural Interface for Biopotentials Recording and PNS Stimulation**
Bisoni, Lorenzo *(Università di cagliari)*; Carboni, Caterina* *(Università di cagliari)*; Puddu, Roberto *(Università di cagliari)*; Barabino, Gianluca *(University of Cagliari)*; Pani, Danilo *(University of Cagliari)*; Raffo, Luigi *(University of Cagliari)*; Mueller, Matthias *(University of Freiburg)*; Stieglitz, Thomas *(University of Freiburg)*; del Valle, Jaume *(Universitat Autonoma de Barcelona)*; de la Oliva, Natàlia *(Universitat Autònoma de Barcelona)*; Delgado-Martínez, Ignacio *(National University of Singapore)*; Navarro, Xavier *(Universitat Autònoma de Barcelona)*; Barbaro, Massimo *(University of Cagliari)*

**11:05-11:20**               **ThBT9.2**
**Auditory Responses to Short-Wavelength Infrared Neural Stimulation of the Rat Cochlear Nucleus**
Jiang, Bin *(Chongqing Univ.)*; Xia, Nan *(Chongqing Univ.)*; Hou, Wensheng* *(Bioengineering Inst of Chongqing Univ)*

**11:20-11:35**               **ThBT9.3**
**A Computational Study on Effect of a Transcranial Channel as a Skull/Brain Interface in the Conventional Rectangular Patch-Type Transcranial Direct Current Stimulation**
Seo, Hyeon *(Gwangju Institute of Science and Tech.)*; Kim, Hyoung-Ihl *(Gwangju Institute of Science and Tech.)*; Jun, Sung Chan* *(Gwangju Institute of Science and Tech.)*

**11:35-11:50**               **ThBT9.4**
**Assessing RTMS Effects in MdDS: Cross-Modal Comparison between Resting State EEG and fMRI Connectivity**
Chen, Yafen *(University of Oklahoma)*; Li, Chuang *(University of Oklahoma)*; Shou, Guofa *(University of Oklahoma)*; Urbano, Diamond *(Laureate Institute for Brain Research)*; Cha, Yoon-Hee *(Laureate Institute of Brain Research)*; Ding, Lei *(University of Oklahoma)*; Yuan, Han* *(University of Oklahoma)*

**11:50-12:05**               **ThBT9.5**
**Closed-Loop Low-Frequency DBS Restores Thalamocortical Relay Fidelity in a Computational Model of the Motor Loop**
Huang, Han *(Johns Hopkins University)*; Santaniello, Sabato* *(University of Connecticut)*

**12:05-12:20**               **ThBT9.6**
**Electric Field Stimulation Protects Injured Spinal Cord from Secondary Inflammatory Response in Rats**
Huo, Xiaolin *(Chinese Academy of Sciences)*; Zhang, Guanghao *(Institute of Electrical Engineering, Chinese Academy of Sciences)*; Wu, Changzhe *(Chinese Academy of Sciences)*; Zhang, Cheng* *(Chinese Academy of Sciences, Beijing,)*

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**ThBT10:** 10:50-12:20         Schmitt Room
**Authentication using Biological Signals** (Minisymposium)
**Chair:** Park, Kwang S. *(Seoul National University)*
**Co-Chair:** Kim, Jason *(Korea Internet and Security Agency)*

**10:50-11:05**               **ThBT10.1**
**Merging Bio-Signals with Traditional Biometrics: Taking the Best of Both Worlds**
Sanchez-Reillo, Raul* *(Carlos III University of Madrid, University Group for Identifica)*; Miranda-Escalada, Antonio *(Carlos III University of Madrid, University Group for Identifica)*; Fernandez-Lopez, Pablo *(Carlos III University of Madrid, University Group for Identifica)*; Sanchez-Casanova, Jorge *(Carlos III University of Madrid, University Group for Identifica)*

**11:05-11:20**               **ThBT10.2**
**Development of Multi-Modal Bio-Signal Authentication Platform**
Kim, Jason* *(Korea Internet & Security Agency)*; Lee, Saewoom *(KISA (Korea Internet & Security Agency))*

**11:20-11:35**               **ThBT10.3**
**Implementing Biology-to-Machine (B2M) Protocol for a Telebiometric Biosignal Authentication Application**
Caras, John* *(Disney-Visa)*

**11:35-11:50**               **ThBT10.4**
**Human Identification using Non-Invasive Biological Signals**
Kim, Jeehoon *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

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**ThBT11:** 10:50-12:20        Greatbatch Room
**Recent Advances on Cuff-Less Blood Pressure Measurement Technology I** (Minisymposium)
**Chair:** Hahn, Jin-Oh *(University of Maryland)*
**Co-Chair:** Inan, Omer *(Georgia Institute of Technology)*

**10:50-11:05**               **ThBT11.1**
**A Simultaneous Multisite Assessment of the Pulse Transit Time**
Di Rienzo, Marco* *(Fondazione Don Carlo Gnocchi)*; Lombardi, Prospero *(Fondazione Don Carlo Gnocchi ONLUS)*; Vaini, Emanuele *(Polo Tecnologico, Fondazione Don Carlo Gnocchi)*

**11:05-11:20**               **ThBT11.2**
**A Patch-Type Multi-Parameter Blood Pressure Monitoring Device: Performance of Surrogate Markers in Two Different Conditions**
Lee, Joonnyong *(Seoul National Univ.)*; Park, Jonghyun *(Seoul National Univ., Graduate School)*; Yang, Seungman *(Seoul National Univ.)*; Sohn, Jangjay *(Seoul National Univ.)*; Yoo, Byeongwook *(Interdisciplinary Program of Bioengineering, Seoul National Univ)*; Lee, Saram *(Seoul National Univ. Hospital)*; Kim, Hee Chan* *(Seoul National Univ.)*

**11:20-11:35**               **ThBT11.3**
**Non-Invasive and Cuffless Device based on Pulse Transit Time for Blood Pressure Monitoring**
Sethi, Tavpritesh *(Indraprastha Institute of Information Technology Delhi)*; Prakash, Suriya *(CSIR-CEERI)*; Gupta, Surendra *(CSIR-CEERI)*; Subramanian, Meera *(CSIR-CEERI)*; Morey, Gautam *(Sofomo Embedded Solutions Pvt. Ltd)*; Dash, Debasis *(CSIR-IGIB)*; Agrawal, Anurag *(CSIR-IGIB)*; Pesala, Bala* *(CSIR-CEERI)*

**11:35-11:50**               **ThBT11.4**
**Pressure Dependence of Arterial Pulse Wave Velocity: Influence on Calibration of Cuff-Less BP Monitoring based on Arterial Pulse Transit Time**
Avolio, Alberto P* *(Macquarie University)*; Butlin, Mark *(Macquarie University)*; Shirbani, Fatemeh *(Macquarie University, Faculty of Medicine and Health Sciences)*

**11:50-12:05**               **ThBT11.5**
**Unobtrusive Blood Pressure Monitoring via Pulse Transit Time**
Kim, Chang-Sei *(Univ. of Maryland)*; Ober, Stephanie *(Univ. of Maryland College Park)*; Carek, Andrew *(Georgia Institute of Tech.)*; Ashouri, Hazar *(Georgia Institute of Tech.)*; Inan, Omer *(Georgia Institute of Tech.)*; Mukkamala, Ramakrishna *(Michigan State Univ.)*; Hahn, Jin-Oh* *(Univ. of Maryland)*

**12:05-12:20**  ThBT11.6
**Toward Ubiquitous Blood Pressure Monitoring via Pulse Transit Time: Maximum Calibration Period and Acceptable Accuracy**
Mukkamala, Ramakrishna* *(Michigan State University)*; Hahn, Jin-Oh *(University of Maryland)*

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**ThBT12**: 10:50-12:20  Geddes Room
**Modeling of Modern Devices and Technologies with Computational Human Phantoms – II** (Invited Session)
**Chair:** Nagaoka, Tomoaki *(National Institute Info and Comm Tech)*

**10:50-11:05**  ThBT12.1
**Estimates of Peak Electric Fields Induced by Transcranial Magnetic Stimulation in a Pregnant Patient using an FEM Full-Body Model**
Yanamadala, Janakinadh* *(Worcester Polytechnic Inst.)*; Noetscher, Gregory *(Worcester Polytechnic Inst.)*; Makarov, Sergey *(Electrical & Computer Engineering, Worcester Polytechnic Instit)*; Pascual-Leone, Alvaro *(Harvard Medical School)*

**11:05-11:20**  ThBT12.2
**Posture Transformation for Voxel-Based Anatomical Human Models**
Nagaoka, Tomoaki* *(National Institute Info & Comm Tech)*

**11:20-11:35**  ThBT12.3
**RF MRI Coil Detuning for Anatomically Realistic Respiratory Cycle Modeled with the Finite Element Method**
Tran, Anh Le *(Worcester Polytechnic Institute)*; Makarov, Sergey* *(Electrical and Computer Engineering, Worcester Polytechnic Instit)*

**11:35-11:50**  ThBT12.4
**The Visible Human Project Male CAD based Computational Phantom and Its use in Electromagnetic Simulations**
Noetscher, Gregory* *(Worcester Polytechnic Institute)*; Htet, Aung Thu *(Worcester Polytechnic Institute)*; Maino, Nicholas *(Worcester Polytechnic Institute)*; Lacroix, Patrick *(wpi)*

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**ThBT13**: 10:50-12:20  Dunn Room
**Implantable Technologies and Systems** (Oral Session)

**10:50-11:05**  ThBT13.1
**A Study on Setting of the Fatigue Limit of Temporary Dental Implants**
Kim, Mi Hye* *(Ministry of Food and Drug Safety)*; Eunjeong, Cho *(Ministry of Food and Drug Safety)*; Jiwon, Lee *(Ministry of Food and Drug Safety)*; Eunkyo, Kim *(Medical Devices Research Division)*; Sihyung, Yoo *(Ministry of Food and Drug Safety)*; Park, Chang Won *(National Institute of Food and Drug Safety Evaluation, Ministry)*

**11:05-11:20**  ThBT13.2
**A Wirelessly Powered Implantable Radiofrequency Nerve Lesioning System for the Treatment of Chronic Pain**
Tang, Sai Chun* *(Harvard Medical School, Brigham and Women's Hospital)*; McDannold, Nathan *(Brigham & Women's Hospital)*; Vaninetti, Michael *(University of California San Diego, VA San Diego Healthcare Syst)*

**11:20-11:35**  ThBT13.3
**An IC-Based Controllable Stimulator for Respiratory Muscle Stimulation Investigations**
Castelli, Jonathan* *(Univ. of Bordeaux)*; Kolbl, Florian *(Univ. of Bordeaux)*; Siu, Ricardo *(Florida International Univ.)*; N'Kaoua, Gilles *(CNRS, IMS UMR)*; Bornat, Yannick *(IMS Laboratory)*; Mangalore, Ashwin *(Univ. of Bordeaux, IMS, CNRS UMR)*; Hillen, Brian *(Florida International Univ.)*; Abbas, James *(Arizona State Univ.)*; Renaud, Sylvie *(Univ. of Bordeaux1, IMS, Enseirb)*; Jung, Ranu *(Florida International Univ.)*; Lewis, Noëlle *(Univ. of Bordeaux 1, IPB, IMS, CNRS UMR)*

**11:35-11:50**  ThBT13.4
**An Intracardiac Electrogram Model to Bridge Virtual Hearts and Implantable Cardiac Devices**
Ai, Weiwei* *(University of Auckland)*; Patel, Nitish *(University of Auckland)*; Roop, Parthasarathi *(University of Auckland)*; Malik, Avinash *(University of Auckland)*; Allen, Nathan *(University of Auckland)*; Trew, Mark L. *(University of Auckland)*

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**11:50-12:05**  ThBT13.5
**A Wireless Optical Power System for Medical Implants using Low Power Near-IR Laser**
Saha, Anindo* *(American Intl. Univ.-Bangladesh)*; Iqbal, Shabab *(American Intl. Univ.-Bangladesh)*; Karmaker, Mithun *(American Intl. Univ.-Bangladesh)*; Zinnat, Syeda Fairose *(American Intl. Univ.-Bangladesh)*; Ali, M. Tanseer *(American Intl. Univ.-Bangladesh)*

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**ThBT14**: 10:50-12:20  Schaldach Room
**Machine Learning in Imaging II** (Oral Session)
**Chair:** Unser, Michael *(EPFL)*

**10:50-11:05**  ThBT14.1
**Deep Scattering Convolution Network based Features for Ultrasonic Fatty Liver Tissue Characterization**
Ramkrishna, Bharath* *(Indian institute of Tech. Hyderabad)*; P, Rajalakshmi *(Indian Institute of Tech. Hyderabad)*

**11:05-11:20**  ThBT14.2
**NucleiNet: A Convolutional Encoder-Decoder Network for Bio-Image Desnoising**
Liu, Zi-chuan* *(Nanyang Technological Univ.)*; Hu, Yi-fei *(Nanyang Technological Univ.)*; Xu, Hang *(Nanyang Technological Univ.)*; Nasser, Lamees *(Bioinformatics Institute (BII), A*STAR)*; Boudier, Thomas *(A-STAR)*; Coquent, Philippe *(Nanyang Technological Univ.)*; Yu, Hao *(Nanyang Technological Univ.)*

**11:20-11:35**  ThBT14.3
**Automated Discrimination of Dementia Spectrum Disorders using Extreme Learning Machine and Structural T1 MRI Features**
Kim, Jongin* *(Gwangju Institute of Science and Tech.)*; Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

**11:35-11:50**  ThBT14.4
**Exploring Transfer Learning for Gastrointestinal Bleeding Detection on Small-Size Imbalanced Endoscopy Images**
Li, Xiuli* *(IBM Research – China)*; Zhang, Hao *(ANKON Tech. Co., LTD - China)*; Zhang, Xiaolu *(IBM Research – China)*; Liu, Hao *(ANKON Tech. Co., LTD - China)*; Xie, Guotong *(IBM Research – China)*

**11:50-12:05**  ThBT14.5
**Brain Tumor Segmentation using Cascaded Deep Convolutional Neural Network**
Hussain, Saddam *(University of Engineering and Tech., Taxila)*; Anwar, Syed* *(University of Engineering and Tech.)*; Majid, Muhammad *(University of Engineering and Tech., Taxila)*

**12:05-12:20**  ThBT14.6
**Surgical Tool Detection in Cataract Surgery Videos through Multi-Image Fusion Inside a Convolutional Neural Network**
Alhajj, Hassan *(Inserm)*; Lamard, Mathieu *(Université de Bretagne Occidentale)*; Charrière, Katia *(LaTIM - INSERM UMR 1101, Brest, F-29200 France)*; Cochener, Béatrice *(CHU Morvan)*; Quellec, Gwenole* *(Inserm)*

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**ThBT15**: 10:50-12:20  Webster Room
**Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea II** (Minisymposium)
**Chair:** Khoo, Michael *(University of Southern California)*
**Co-Chair:** Penzel, Thomas *(Charite Universitätsmedizin Berlin)*

**10:50-11:05**  ThBT15.1
**Screening Patients for Risk of Sleep Apnea using Facial Photographs**
de Chazal, Philip* *(Univ. of Sydney)*; Tabatabaei Balaei, Asghar *(Univ. of Sydney)*; Nosrati, Hadis *(The Univ. of Sydney)*

**11:05-11:20**  ThBT15.2
**Improving Diagnosis of OSA by Interpretation of Breath Sounds in mHealth**
Jané, Raimon* *(Institute for Bioengineering de Catalunya (IBEC)*; Castillo, Yolanda *(Institute for Bioengineering of Catalonia (IBEC))*; Cámara, Miguel Ángel *(Institute for Bioengineering of Catalonia)*; Blanco-Almazán, Dolores *(Institute for Bioengineering of Catalonia)*; Estrada, Luis *(Institute for Bioengineering de Catalunya)*

**11:20-11:35**　　　　　　　　　　　　　　ThBT15.3

**Directional Coupling in Cardiorespiratory System According to the Activation of Autonomic Nervous System Depending on Sleep Stages**

Yoon, Heenam *(Seoul National Univ.)*; Lee, Yujin *(Seoul National Univ. Hospital)*; Jeong, Do-Un *(Seoul National Univ. Hospital)*; Park, Kwang S.* *(Seoul National Univ.)*

**11:35-11:50**　　　　　　　　　　　　　　ThBT15.4

**Quantitative Monitoring of Sleep Apnea and Hypopnea using Portable Electrical Impedance Tomography (EIT)**

Woo, Eung Je* *(Kyung Hee University)*; Oh, Tong In *(Kyunghee University)*; Wi, Hun *(Kyunghee University)*

**10:50-11:05**　　　　　　　　　　　　　　ThBT17.1

**Automatic Quiet Sleep Detection based on Multifractality in Preterm Neonates: Effects of Maturation**

Lavanga, Mario* *(KU Leuven)*; De Wel, Ofelie *(KU Leuven)*; Caicedo Dorado, Alexa nder *(KU Leuven)*; Heremans, Elisabeth *(KU Leuven)*; Jansen, Katrien *(Dept. of Pediatrics, University Hospital Gasthuisberg, Leuve)*; Dereymaeker, Anneleen *(Dept. of Development and Regeneration, University of Leuven)*; Naulaers, Gunnar *(University Hospitals Leuven)*; Van Huffel, Sabine *(KU Leuven Leuven)*

**11:05-11:20**　　　　　　　　　　　　　　ThBT17.2

**Mutual Information for Intrapartum Fetal Heart Rate Analysis**

Granero Belinchon Carlos, Granero *(Univ Lyon, Ens de Lyon, Univ Claude Bernard, CNRS, Lab d)*; Roux, Stéphane* *(ENS Lyon, CNRS)*; Garnier, Nicolas B. *(Univ Lyon, ENS de Lyon, Univ Claude Bernard, CNRS)*; Abry, Patrice *(ENS Lyon, CNRS)*; Doret, Muriel *(Hospices Civils de Lyon Univ. Lyon I)*

**11:20-11:35**　　　　　　　　　　　　　　ThBT17.3

**Portable Neonatal EEG Monitoring and Sonification on an Android Device**

Poveda Pena, Jonatan *(Univ. Politècnica de Catalunya)*; O'Sullivan, Mark* *(Univ. College Cork)*; Popovici, Emanuel *(Univ. College Cork)*; Temko, Andriy *(Univ. College Cork)*

**11:35-11:50**　　　　　　　　　　　　　　ThBT17.4

**A Semi-Markov Chain Approach to Modeling Respiratory Patterns Prior to Extubation in Preterm Infants**

Onu, Charles Chijioke* *(McGill University)*; Kanbar, Lara *(McGill University)*; Shalish, Wissam *(McGill University)*; Brown, Karen *(McGill University)*; Sant'Anna, Guilherme Mendes *(McGill University)*; Kearney, Robert Edward *(McGill University)*; Precup, Doina *(McGill University)*

**11:50-12:05**　　　　　　　　　　　　　　ThBT17.5

**Influence of ECG Sampling Rate in Fetal Heart Rate Variability Analysis**

De Jonckheere, Julien* *(CHRU de Lille)*; Jeanne, Mathieu *(CHRU de Lille)*; Logier, Regis *(CHRU de Lille)*

**10:50-11:05**　　　　　　　　　　　　　　ThBT18.1

**Convolutional Neural Networks for Event-Related Potential Detection: Impact of the Architecture**

Cecotti, Hubert* *(University of Ulster)*

**11:05-11:20**　　　　　　　　　　　　　　ThBT18.2

**Design of Deep Convolutional Networks for Prediction of Image Rapid Serial Visual Presentation Events**

Mao, Zijing *(UTSA)*; Yao, Wan Xiang *(UTSA)*; Huang, Yufei* *(University of Texas at San Antonio)*

**11:20-11:35**　　　　　　　　　　　　　　ThBT18.3

**A Novel Approach for Automatic Detection of Atrial Fibrillation based on Inter Beat Intervals and Support Vector Machine**

Andersen, Rasmus Sten* *(Technical University of Denmark)*; Poulsen, Erik S. *(Cortrium ApS)*; Puthusserypady, Sadasivan *(Technical University of Denmark)*

**11:35-11:50**　　　　　　　　　　　　　　ThBT18.4

**Informative Sensor Selection and Learning for Prediction of Lower Limb Kinematics using Generative Stochastic Neural Networks**

Chong, Eunsuk *(Korea Institute of Science and Technology)*; Choi, Taejin *(Korea Institute of Science and Technology)*; Kim, Hyungmin *(Korea Institute of Science and Technology)*; Kim, Seung-Jong *(Korea Institute of Science and Technology)*; Hwang, Yoha *(Korea Institute of Science and Technology)*; Lee, Jong Min* *(Korea Institute of Science and Technology)*

**11:50-12:05**　　　　　　　　　　　　　　ThBT18.5

**Using Non-Iterative Methods and Random Weight Networks to Classify Upper-Limb Movements through sEMG Signals**

Cene, Vinicius H. *(UFRGS)*; Favieiro, Gabriela Winkler* *(Federal University of Rio Grande do Sul (UFRGS))*; Balbinot, Alexandre *(Federal University of Rio Grande do Sul (UFRGS))*

**14:20-14:35**　　　　　　　　　　　　　　ThCT3.1

**Electric Properties Tomography for MRI – An Introduction**

Katscher, Ulrich* *(Philips Research Europe - Hamburg)*

**14:35-14:50**　　　　　　　　　　　　　　ThCT3.2

**TE=0 Phase Estimation in Multi-Echo Gradient Echo for Simultaneous Conductivity and Susceptibility Imaging**

Kim, Dong-Hyun* *(Yonsei University)*

**14:20-14:35**　　　　　　　　　　　　　　ThCT5.1

**Graphene-Based Implantable Electrocardiogram Flexible Monitoring Device**

Ma, Zhenqiang* *(Univ. of Wisconsin-Madison)*; Bong, Jihye *(Univ. of Wisconsin, Madison)*; Lee, Juhwan *(Univ. of Wisconsin, Madison)*; Jung, Yei Hwan *(Univ. of Wisconsin, Madison)*; Ryu, Jae Ha *(Univ. of Wisconsin, Madison)*; Attia, Itzhak Z. *(Mayo Clinic)*; Ladewig, Dorothy *(Mayo Clinic)*; Friedman, Paul *(Mayo Clinic)*

**14:35-14:50**　　　　　　　　　　　　　　ThCT5.2

**Development of a Low-Cost Wearable Device for Intermittent and Continuous Monitoring of Paroxysmal Atrial Fibrillation**

Chon, Ki* *(University of Connecticut)*

**14:50-15:05**　　　　　　　　　　　　　　ThCT5.3

**Wearable Device for Cardiac Rehabilitation**

Lee, Hooseok *(Wonkwang University School of Medicine)*; Chung, Heewon *(Wonkwang University School of Medicine)*; Ko, Hoon *(Wonkwang University School of Medicine)*; Lee, Jinseok* *(Wonkwang University School of Medicine)*

**15:05-15:20**　　　　　　　　　　　　　　ThCT5.4

**A Pulse Arrival Time based Index as Surrogates of Ankle Brachial Index for the Assessment of Peripheral Arterial Disease**

Poon, Carmen C. Y.* *(The Chinese Univ. of Hong Kong)*; Yan, Bryan P. *(Prince of Wales Hospital, The Chinese Univ. of Hong Kong)*; Lau, James Y. W. *(The Chinese Univ. of Hong Kong)*; Zheng, Yali *(The Chinese Univ. of Hong Kong)*

**15:20-15:35**  ThCT5.5
**Exploration and Validation of Alternate Sensing Methods for Wearable Continuous Pulse Transit Time Measurement using Optical and Bioimpedance Modalities**
Ibrahim, Bassem *(Texas A&M Univ.)*; Nathan, Viswam *(Texas A&M Univ.)*; Jafari, Roozbeh* *(Texas A&M Univ.)*

**ThCT6: 14:20-15:50**  Zworykin Room
**Tissue Engineering** (Oral Session)
**Chair:** Lee, EunAh *(Kyung Hee University)*

**14:20-14:35**  ThCT6.1
**Experimental Research on Oxygen Enrichment in Bioreactors based on Oxygen Carriers**
Wu, Changzhe *(Chinese Academy of Sciences)*; Zhang, Cheng *(Chinese Academy of Sciences, Beijing,)*; Zhang, Guanghao *(Institute of Electrical Engineering, Chinese Academy of Sciences)*; Huo, Xiaolin* *(Chinese Academy of Sciences)*

**14:35-14:50**  ThCT6.2
**In Vitro Cell Culture Study of the Conditions of Inhibition Effect of Tumors under Alternating Electric Field**
Huang, Chun-Hao *(Chang Gung University)*; Lei, Kin Fong* *(Chang Gung University)*

**14:50-15:05**  ThCT6.3
**Evaluation of Histological and Biomechanical Properties on Engineered Meniscus Tissues using Sonication Decellularization**
Mardhiyah, Ainaaul *(International Islamic University Malaysia)*; Sha'ban, Munirah *(International Islamic University Malaysia)*; Azhim, Azran* *(International Islamic University Malaysia)*

**15:05-15:20**  ThCT6.4
**Improve Blood Compatibility of Bioresorbable Magnesium Stents Coated with Functionalized Anti-CD34 Antibody and Heparin-Collagen Multiplayers**
Kan, Chung-Dann* *(National Cheng Kung Univ. Hospital, Dept. of Surgery)*; Lai, Yi-Ping *(National Cheng Kung University)*

**15:20-15:35**  ThCT6.5
**Evaluation of Recellularization on Decellularized Aorta Scaffolds Engineered by Ultrasonication Treatment**
Fitriatul, Nurul *(International Islamic University Malaysia)*; Sha'ban, Munirah *(International Islamic University Malaysia)*; Azhim, Azran* *(International Islamic University Malaysia)*

**15:35-15:50**  ThCT6.6
**A Three-Dimensional Cell Culture Device for Simulation of Hepatic Hypertension**
Kuo, Po-Ling* *(National Taiwan University)*; Phung, Hao-Dinh *(National Taiwan University)*

**ThCT8: 14:20-15:50**  Schwan Room
**Brain-Computer Interface III** (Oral Session)
**Chair:** Lee, Boreom *(Gwangju Inst. of Science and Tech. (GIST))*

**14:20-14:35**  ThCT8.1
**Phase-Based SSVEPs for Real-Time Control of a Motorised Bed**
Gauci, Norbert *(University of Malta)*; Falzon, Owen* *(University of Malta)*; Camilleri, Tracey *(University of Malta)*; Camilleri, Kenneth Patrick *(University of Malta)*

**14:35-14:50**  ThCT8.2
**Hierarchical Decoding of Grasping Commands from EEG**
Omedes, Jason* *(Univ. of Zaragoza)*; Schwarz, Andreas *(Graz, Univ. of Technology)*; Montesano, Luis *(Universidad de Zaragoza)*; Müller-Putz, Gernot *(Graz Univ. of Technology)*

**14:50-15:05**  ThCT8.3
**Detection of Self-Paced Movement Intention from Pre-Movement Electroencephalogram Signals with Hilbert Transform**
Zeng, Hong* *(Southeast University)*; Wu, Changcheng *(Southeast University)*; Song, Aiguo *(Southeast University)*; Xu, Baoguo *(Southeast University)*; Li, Huijun *(Southeast University)*; Pengcheng, Wen *(AVIC Aeronautics Computing Technique Research Institute)*; Liu, Jia *(Nanjing University of Information Sciences & Technology)*

**15:05-15:20**  ThCT8.4
**The Contribution of Different Frequency Bands in Class Separability of Covert Speech Tasks for BCIs**
Jahangiri, Amir* *(University of Essex)*; Sepulveda, Francisco *(University of Essex)*

**15:20-15:35**  ThCT8.5
**EEG Classification for Motor Imagery BCI using Phase-Only Features Extracted by Independent Component Analysis**
Qureshi, Muhammad Naveed Iqbal *(Gwangju Institute of Science and Technology, Gwangju)*; Cho, Dongrae *(Gwangju Institute of Science and Technology)*; Lee, Boreom* *(Gwangju Institute of Science and Technology (GIST))*

**15:35-15:50**  ThCT8.6
**Speeding Up SVM Training in Brain-Computer Interfaces**
Lee, David *(The Catholic Univ. of Korea)*; Lee, Hee-Jae *(The Catholic Univ. of Korea)*; Park, Sang-Hoon *(The Catholic Univ. of Korea)*; Jung, Woo-Hyuk *(The Catholic Univ. of Korea)*; Kim Jaeho, Jaeho *(The Catholic Univ. of Korea, Dept. Digital Media)*; Lee, Sang-Goog* *(the Catholic of Univ. of Korea)*

**ThCT9: 14:20-15:50**  Plonsey Room
**Neural Stimulation II** (Oral Session)

**14:20-14:35**  ThCT9.1
**Predicting the Stimulation Effectiveness using Pre-Stimulation Neural States via Optogenetic Activation of the Medial Septum Glutamatergic Neurons Modulating the Hippocampal Neural Activity**
Park, Sang-Eon* *(Georgia Institute of Technology)*; Laxpati, Nealen *(Emory University School of Medicine, Georgia Institute of Techno)*; Connolly, Mark *(Emory University)*; Mahmoudi, Babak *(Emory University)*; Gross, Robert *(Emory University)*

**14:35-14:50**  ThCT9.2
**Galvanic Vestibular Stimulation (GVS) Effects on Impaired Interhemispheric Connectivity in Parkinson's Disease**
Lee, Soojin* *(The University of British Columbia)*; Kim, Diana *(The University of British Columbia)*; McKeown, Martin *(University of British Columbia)*

**14:50-15:05**  ThCT9.3
**Network-Mediated Responses of ON Ganglion Cells to Electric Stimulation become Less Consistent Across Trials during Retinal Degeneration**
Lee, Jae-Ik* *(Henry Ford Health System)*; Fried, Shelley *(Massachusetts General Hospital / Harvard Medical School)*; Im, Maesoon *(Henry Ford Health System)*

**15:05-15:20**  ThCT9.4
**An Artifact-Suppressed Stimulator for Simultaneous Neural Recording and Stimulation Systems**
Liu, Xu* *(Beijing University of Technology)*; Yao, Lei *(Institute of Microelectronics, Singapore)*; Li, Peng *(Institute of Microelectronics)*; Liu, Lei *(Nanyang Technological University, Singapore.)*; Zou, Xiaodan *(Institute of Microelectronics, Singapore)*; Je, Minkyu *(Institute of Microelectronics)*; Xu, Yong Ping *(National University of Singapore)*

**15:20-15:35**  ThCT9.5
**A Machine Learning Approach to Characterizing the Effect of Asynchronous Distributed Electrical Stimulation on Hippocampal Neural Dynamics in Vivo**
Connolly, Mark* *(Emory University)*; Park, Sang-Eon *(Georgia Institute of Technology)*; Gross, Robert *(Emory University)*; Mahmoudi, Babak *(Emory University)*

**15:35-15:50**  ThCT9.6
**Effects of Transcranial Direct Current Stimulation on Steady-State Visual Evoked Potentials**
Liu, Bingchuan *(Tsinghua University)*; Chen, Xiaogang *(Institute of Biomedical Engineering, Chinese Academy of Medical)*; Yang, Chen *(Tsinghua University)*; Wu, Jian *(Tsinghua University)*; Gao, Xiaorong* *(Tsinghua University)*

**General and Theoretical Informatics – Algorithms I** (Oral Session)

14:20-14:35            ThCT10.1
**A Novel Blood Pressure Estimation Method Combing Pulse Wave Transit Time Model and Neural Network Model**
Xu, Jun *(Shanghai Univ.)*; Jiang, Jiehui* *(Shanghai Univ.)*; Zhou, Hucheng *(Shanghai Univ.)*; Yan, Zhuangzhi *(Shanghai Univ.)*

14:35-14:50            ThCT10.2
**Assessment of Stress Wave Induced by Diode Laser**
Oh, Han-Byeol *(Konkuk University)*; Kim, Ji-Sun *(Konkuk University)*; Baek, Jin-Young *(Konkuk University)*; Jun, Jae-Hoon* *(Konkuk University)*

14:50-15:05            ThCT10.3
**Elastic Modulus Estimation based on Local Displacement Observation of Elastic Body**
Morita, Mitsuki* *(Kyoto University)*; Nakao, Megumi *(Kyoto University)*; Matsuda, Tetsuya *(Kyoto University)*

15:05-15:20            ThCT10.4
**The Classification for "Equilibrium Triad" Sensory Loss based on sEMG Signals of Calf Muscles**
Yu, Hairong* *(University of Technology, Sydney)*; Guo, Kairui *(University of Technology, Sydney)*; Luo, Jie *(Sun Yat-sen University)*; Cao, Kai *(University of Technology, Sydney)*; Nguyen, Hung T. *(University of Technology, Sydney)*; Su, Steven Weidong *(University of Technology, Sydney)*

15:20-15:35            ThCT10.5
**Likelihood-Based Artefact Detection in Continuously-Acquired Patient Vital Signs**
Colopy, Glen Wright* *(Univ. of Oxford)*; Zhu, Tingting *(Univ. of Oxford)*; Clifton, Lei *(Univ. of Oxford)*; Roberts, Stephen *(Univ. of Oxford)*; Clifton, David *(Univ. of Oxford)*

15:35-15:50            ThCT10.6
**Accuracy of a Wavelet-Based Fall Detection Approach using an Accelerometer and a Barometric Pressure Sensor**
Ejupi, Andreas* *(Simon Fraser University (SFU))*; Galang, Chantel *(Simon Fraser University)*; Aziz, Omar *(Simon Fraser University)*; Park, Edward J. *(Simon Fraser University)*; Robinovitch, Stephen *(Simon Fraser University)*

**Recent Advances on Cuff-Less Blood Pressure Measurement Technology II** (Minisymposium)
**Chair:** Mukkamala, Ramakrishna *(Michigan State University)*
**Co-Chair:** Mestha, Lalit, K. *(GE Global Research)*

14:20-14:35            ThCT11.1
**Non-Invasive Beat-to-Beat Pulse Pressure Measurement and Pulse Wave Analysis at a Spot Check**
Seo, Joohyun* *(Massachusetts Institute of Technology)*; Sodini, Charles *(Massachusetts Institute of Technology)*; Lee, Hae-Seung *(Massachusetts Institute of Technology)*

14:35-14:50            ThCT11.2
**Cuffless Blood Pressure Monitoring at the Chest: Single-Channel Reflective PPG Sensors are Inaccurate**
Sola, Josep *(CSEM - Centre Suisse d'Electronique et Microtechnique)*; Vybornova, Anna *(EPFL)*; Braun, Fabian *(CSEM SA)*; Proença, Martin *(Swiss Center for Electronics and Microtechnology (CSEM))*; Delgado-Gonzalo, Ricard* *(CSEM)*; Ferrario, Damien *(CSEM)*; Verjus, Christophe *(CSEM)*; Bertschi, Mattia *(CSEM)*; Pierrel, Nicolas *(CHUV)*; Degiorgis, Yan *(CHUV)*; Schoettker, Patrick *(CHUV – Centre Hospitalier Universitaire Vaudois)*

14:50-15:05            ThCT11.3
**Cuffless Blood Pressure Measurement using Ultrasound and Dual Photoplethysmograph Transducer**
PM, Nabeel* *(Indian Institute of Tech. Madras)*; Karthik, Srinivasa *(HTIC IIT Madras)*; Joseph, Jayaraj *(HTIC, Indian Institute of Tech. Madras)*; Chenniappan, M *(Ramakrishna Medical Centre)*; Sivaprakasam, Mohanasankar *(Indian Institute of Tech. Madras)*

15:05-15:20            ThCT11.4
**Wearable Continuous BP Monitoring Solution using PPG Signal**
Singh, Wazir *(Indraprastha Institute of Information Tech., Delhi)*; Jain, Monika *(Indraprastha Institute of Information Tech., Delhi)*; Singh Chadha, Jaidev *(Delhi Technological University, Delhi)*; Deb, Sujay* *(Indraprastha Institute of Information Tech., Delhi)*

15:20-15:35            ThCT11.5
**Arterial Blood Pressure Estimation using Ultrasound: Clinical Results on Healthy Volunteers and a Medicated Hypertensive Volunteer**
Zakrzewski, Aaron M.* *(Massachusetts Institute of Technology)*; Anthony, Brian W. *(Massachusetts Institute of Technology)*

**Modeling of Modern Devices and Technologies with Computational Human Phantoms – III** (Invited Session)
**Chair:** Wenger, Cornelia *(Novocure GmbH)*

14:20-14:35            ThCT12.1
**Impact of Computational Human Model on the Calculation of RF-Induced Voltages for Medical Devices in MRI**
Brown, James *(MSEI)*; Qiang, Rui* *(1976)*; Stadnik, Paul *(Micro Systems Engineering, Inc.)*; Stotts, Larry *(Biotronik)*; Von Arx, Jeffrey *(Micro Systems Engineering, Inc.)*

14:35-14:50            ThCT12.2
**Transmit Coil Design for Wireless Power Transfer for Medical Implants**
Lemdiasov, Rosti *(Cambridge Consultants)*; Venkatasubramanian, Arun* *(Cambridge Consultants)*

14:50-15:05            ThCT12.3
**Determining the Dielectric Properties of Human Skin in the Frequency Range of 0.1 to 1 MHZ, and Implications to the Modelling of Tumor Treating Fields**
Hershkovich, Hadas Sara *(Novocure Ltd., Haifa, Israel)*; Urman, Noa *(Novocure)*; Naveh, Ariel *(Novocure Ltd.)*; Yesharim, Ofir *(Novocure ltd.)*; Wassermann, Yoram *(Novocure Ltd., Haifa, Israel)*; Kirson, Eilon David *(Novocure)*; Bomzon, Ze'ev* *(Novocure)*

15:05-15:20            ThCT12.4
**A Method for Initial Testing CAD Virtual Human Models**
Louie, Sara *(Ansys, Inc.)*; Horner, Marc *(ANSYS, Inc.)*; Makarov, Sergey* *(Electrical and Computer Engineering, Worcester Polytechnic Instit)*; Noetscher, Gregory *(Worcester Polytechnic Institute)*

15:20-15:35            ThCT12.5
**A Comparison of Two Anatomical Body Models Derived from the Female Visible Human Project Data**
Massey, Jackson White *(University of Texas at Austin)*; Prokop, Alexander* *(Computer Simulation Technology)*; Yilmaz, Ali *(University of Texas at Austin)*

15:35-15:50            ThCT12.6
**Model of a Perfectly Matched RF MRI Coil for SAR Computations with Virtual Human Models**
Makarov, Sergey* *(Electrical and Computer Engineering, Worcester Polytechnic Instit)*; Bogdanov, Gene *(Worcester Polytechnic Institute)*; Tankaria, Harshal *(Worcester Polytechnic Inst.)*; Noetscher, Gregory *(Worcester Polytechnic Institute)*; Louie, Sara *(Ansys, Inc.)*; Nummenmaa, Aapo *(Massachusetts General Hospital)*

**Tissue Stimulation Technologies** (Oral Session)
**Chair:** Panescu, Dorin *(Advanced Cardiac Therapeutics)*
**Co-Chair:** Cheng, Leo *(The University of Auckland)*

14:20-14:35            ThCT13.1
**Measurement of Perception Thresholds for Electrical Noise Stimuli**
Karpul, David *(University of Western Sydney, University of Cape Town)*; McIntyre, Sarah *(Western Sydney University)*; van Schaik, André *(The University of Sydney)*; Breen, Paul* *(University of Western Sydney)*

**14:35-14:50**                                                        ThCT13.2

**New Conducted Electrical Weapons: Finite Element**
**Modeling of Safety Margins**
  Panescu, Dorin* *(Advanced Cardiac Therapeutics)*; Kroll, Mark
  William *(University of Minnesota)*; Brave, Michael *(LAAW*
  *International, LLC, Scottsdale, AZ)*

**14:50-15:05**                                                        ThCT13.3

**System Design and Experimental Research of Lower**
**Esophageal Sphincter Stimulator for Treatment of**
**Gastroesophageal Reflux Disease**
  Sun, Xinchen *(Southeast Univ.)*; Tao, Wanjun *(Southeast*
  *Univ.)*; Zhu, Chuanqing *(Southeast Univ.)*; Zhao, Lili *(The First*
  *Affiliated Hospital of Nanjing Medical Univ.)*; Wang, Min
  *(Nanjing Medical Univ.)*; Lü, Xiaoying* *(Southeast Univ.)*; Wang,
  Zhigong *(Southeast Univ.)*; Fan, Zhining *(The First Affiliated*
  *Hospital of Nanjing Medical Univ.)*

**15:05-15:20**                                                        ThCT13.4

**Design and Application of a Novel Gastric Pacemaker**
  Alighaleh, Saeed *(Auckland Bioengineering Institute, Univ. of*
  *Auckland)*; Angeli, Timothy Robert *(Auckland Bioengineering*
  *Institute, Univ. of Auckland)*; Sathar, Shameer *(Univ. of*
  *Auckland)*; O'Grady, Gregory *(Univ. of Auckland)*; Cheng, Leo
  K* *(The Univ. of Auckland)*; Paskaranandavadivel, Niranchan
  *(The Univ. of Auckland)*

**15:20-15:35**                                                        ThCT13.5

**New Conducted Electrical Weapons: Electrical**
**Safety Relative to Relevant Standards**
  Panescu, Dorin* *(Advanced Cardiac Therapeutics)*; Nerheim,
  Max *(TASER International)*; Kroll, Mark William *(Univ. of*
  *Minnesota)*; Brave, Michael *(LAAW International, LLC)*

**15:35-15:50**                                                        ThCT13.6

**New Conducted Electrical Weapons:**
**Thoracic Cage Shielding Effect**
  Panescu, Dorin* *(Advanced Cardiac Therapeutics)*; Kroll, Mark
  William *(University of Minnesota)*; Brave, Michael *(LAAW*
  *International, LLC, Scottsdale, AZ)*

**ThCT14:  14:20-15:50**                                         Schaldach Room
**Deep Learning in Biomedical Image Analysis** (Invited Session)
**Chair:**  Jeong, Won-Ki *(Ulsan Natl. Inst. of Science & Tech. (UNIST))*
**Co-Chair:**  Ye, Jong Chul *(Korea Advanced Inst of Science & Tech)*

**14:20-14:35**                                                        ThCT14.1

**Detection of Lung Nodules on Thoracic MDCT Images based**
**on Temporal Subtraction Technique**
  Lu, Huimin* *(Kyushu Institute of Technology)*; Tachibana, Rie
  *(Oshima National College of Maritime Technology)*; Tan, Joo
  Kooi *(Kyushu Institute of Technology)*; Kim, Hyoungseop
  *(Kyushu Institute of Technology)*; Hirano, Yasushi *(Yamaguchi*
  *University)*; Kido, Shoji *(Graduate School of Science and*
  *Technology for Innovation, Yamagu)*

**14:35-14:50**                                                        ThCT14.2

**Correlation Analysis of Functional MR Images**
**with Education Level**
  Kim, Sung-Woo *(Korea University)*; Seong, Joon-Kyung* *(Korea*
  *University)*

**14:50-15:05**                                                        ThCT14.3

**Applications of Deep Learning in Medical Image Analysis**
  Suk, Heung-Il* *(Korea University)*

**15:05-15:20**                                                        ThCT14.4

**Connectomics Image Analysis using Deep Learning**
  Quan, Tran Minh *(Ulsan National Institute of Science and*
  *Technology (UNIST))*; Hildebrand, David G. C. *(The Rockefeller*
  *University)*; Jeong, Won-Ki* *(Ulsan National Institute of Science*
  *and Technology (UNIST))*

**ThCT15:  14:20-15:50**                                          Webster Room
**Bioengineering Advances in the Diagnosis and Treatment of**
**Sleep Apnea III (Issues in Therapeutic Modalities for**
**Sleep-Disordered Breathing)** (Minisymposium)
**Chair:**  Khoo, Michael *(Univ. of Southern California)*
**Co-Chair:**  Penzel, Thomas *(Charite Universitätsmedizin Berlin)*

**14:20-14:35**                                                        ThCT15.1

**An Industry Perspective on the Growth of Connected**
**Care and Its Evolution to Personalised Treatment**
**of Sleep-Disordered Breathing**
  Armitstead, Jeffrey Peter* *(Res Med Ltd., University of*
  *Sydney)*; Liu, Dongquan *(Res Med Asia Operations)*;
  Schindhelm, Klaus *(University of New South Wales)*

**14:35-14:50**                                                        ThCT15.2

**Personalizing the Treatment of Sleep Apnea –**
**Using Physiology to Better Predict Treatment**
**Success and Guide Therapy Choice**
  Edwards, Bradley Allan* *(Monash Univ.)*; Sands, Scott Aaron
  *(Brigham and Women's Hospital and Harvard Medical School)*;
  Joosten, Simon *(Monash Health and Monash Univ.)*; Landry,
  Shane *(Monash Univ.)*; Terrill, Philip Ian *(Univ. of Queensland)*;
  Owens, Robert *(Harvard Medical School)*; Malhotra, Atul
  *(Brigham and Women's Hospital and Harvard Medical School)*;
  White, David P *(Brigham and Women's Hospital and Harvard*
  *Medical School)*; Wellman, David Andrew *(Harvard Medical*
  *School)*; Hamilton, Garun *(Dept. of Respiratory and Sleep*
  *Medicine, Monash Medical Cen)*

**14:50-15:05**                                                        ThCT15.3

**Effects of CPAP and Adaptive Servo-Ventilation on**
**Cardiovascular Function in CHF-CSR:**
**A Computer Simulation Study**
  Khoo, Michael* *(University of Southern California)*;
  Hu, Wen-Hsin *(University of Southern California)*

**ThCT17:  14:20-15:50**                                          Einthoven Hall
**Signal Processing and Modelling Techniques**
**for Fetal Monitoring** (Invited Session)
**Chair:**  Khandoker, Ahsan Habib *(Khalifa University of*
*Science, Technology and Research)*

**14:20-14:35**                                                        ThCT17.1

**Investigating Fetal Myocardial Function in Heart Anomalies**
**by Doppler Myocardial Performance Indices**
  Khandoker, Ahsan Habib* *(Khalifa University of Science,*
  *Technology and Research)*; Alangari, Haitham M. *(Khalifa*
  *University)*; Marzbanrad, Faezeh *(The University of Melbourne)*;
  Kimura, Yoshitaka *(Tohoku Univ)*

**14:35-14:50**                                                        ThCT17.2

**Detecting Fetal Heart Sounds by Means of Fractal**
**Dimension Analysis in the Wavelet Domain**
  Koutsiana, Elisavet* *(Lab. of Medical Informatics, The Medical*
  *School, Aristotle Unive)*; Hadjileontiadis, Leontios *(Aristotle*
  *University of Thessaloniki)*; Chouvarda, Ioanna *(Aristotle*
  *University)*; Khandoker, Ahsan Habib *(Khalifa University of*
  *Science, Technology and Research)*

**ThCT18:  14:20-15:50**                                       Montgomery Hall
**Kalman Filtering** (Oral Session)
**Chair:**  Hamid, Laith *(University of Kiel)*

**14:20-14:35**                                                        ThCT18.1

**Self-Reported Well-Being Score Modelling and**
**Prediction: Proof-of-Concept of an Approach**
**based on Linear Dynamic Systems**
  Li, Xinyang *(National Univ. of Singapore)*; Poli, Riccardo *(Univ.*
  *of Essex)*; Valenza, Gaetano *(Univ. of Pisa)*; Scilingo, Enzo
  Pasquale *(Univ. of Pisa)*; Citi, Luca* *(Univ. of Essex)*

**14:35-14:50**                                                        ThCT18.2

**Removal of Spurious Phase Variations in Oscillatory Signals**
  Mortezapouraghdam, Zeinab* *(Saarland University)*;
  Strauss, Daniel J. *(Saarland University, Medical Faculty)*

**14:50-15:05**                                    ThCT18.3
**Spatial Projection as a Preprocessing Step for EEG Source Reconstruction using Spatiotemporal Kalman Filtering**
Hamid, Laith* *(Univ. of Kiel)*; Al Farawn, Ali *(Univ. of Kufa)*; Merlet, Isabelle *(INSERM - Universite de Rennes 1)*; Japaridze, Natia *(Dept. of Neuropediatrics, Christian-Albrechts-Univ. of)*; Heute, Ulrich *(Univ. of Kiel)*; Stephani, Ulrich *(Christian-Albrechts-Univ. of Kiel)*; Galka, Andreas *(Christian-Albrechts-Univ. of Kiel)*; Wendling, Fabrice *(INSERM - Université de Rennes 1)*; Siniatchkin, Michael *(Univ. of Kiel)*

**15:05-15:20**                                    ThCT18.4
**Source Reconstruction via the Spatiotemporal Kalman Filter and LORETA from EEG Time Series with 32 or Fewer Electrodes**
Hamid, Laith* *(Univ. of Kiel)*; Al Farawn, Ali *(Univ. of Kufa)*; Merlet, Isabelle *(INSERM - Universite de Rennes 1)*; Japaridze, Natia *(Dept. of Neuropediatrics, Christian-Albrechts-Univ. of)*; Heute, Ulrich *(Univ. of Kiel)*; Stephani, Ulrich *(Christian-Albrechts-Univ. of Kiel)*; Galka, Andreas *(Christian-Albrechts-Univ. of Kiel)*; Wendling, Fabrice *(INSERM - Université de Rennes 1)*; Siniatchkin, Michael *(Univ. of Kiel)*

**15:20-15:35**                                    ThCT18.5
**Detecting Dynamical Changes in Vital Signs using Switching Kalman Filter**
Almeida, Vania* *(Aston Univ.)*; Nabney, Ian T. *(Aston Univ.)*

**15:35-15:50**                                    ThCT18.6
**A Kalman Filter Approach with State Inequality Constraints for Real-Time Prediction of Intradialytic Hypotension using a PVDF Sensor**
Ansari, Sardar* *(Univ. of Michigan)*; Molaei, Somayeh *(Univ. of Michigan)*; Oldham, Kenn *(Univ. of Michigan)*; Heung, Michael *(Univ. of Michigan)*; Ward, Kevin *(Univ. of Michigan)*; Najarian, Kayvan *(Univ. of Michigan - Ann Arbor)*

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**ThDT1-01:  16:10-17:10**                         Roentgen Hall
**Adaptive Filtering I** (Poster Session)

**16:10-16:12**                                    ThDT1-01.1
**EEG-Based Emotion Estimation using Adaptive Tracking of Discriminative Frequency Components**
Liu, Shuang* *(Tianjin Univ.)*; Zhang, Di *(Tianjin Univ.)*; Tong, Jingjing *(Tianjin Univ.)*; He, Feng *(Tianjin Univ.)*; QI, Hongzhi *(Tianjin Univ.)*; Zhang, L. *(Tianjin Univ.)*; Ming, D. *(Tianjin Univ.)*

**16:12-16:14**                                    ThDT1-01.2
**A Template Subtraction Method for the Removal of Cardiogenic Oscillations on Esophageal Pressure Signals**
Graßhoff, Jan* *(University of Luebeck)*; Petersen, Eike *(University of Lübeck)*; Eger, Marcus *(Dräger Medical)*; Bellani, Giacomo *(Dept. of Experimental Medicine, University of Milan-Bicocca)*; Rostalski, Philipp *(Institute for Electrical Engineering in Medicine, University of)*

**16:14-16:16**                                    ThDT1-01.3
**FPGA Implementation of Adaptive Beamforming in Hearing Aids**
Samtani, Kartik *(National Institute of Tech. Karnataka)*; Thomas, Jobin *(National Institute of Tech. Karnataka)*; Varma, Abhinav *(National Institute of Tech. Karnataka)*; David S., Sumam *(National Institute of Tech. Karnataka, Surathkal)*; S. P., Deepu* *(National Institute of Tech. Karnataka)*

**16:16-16:18**                                    ThDT1-01.4
**Detection of user Independent Single Trial ERPs in Brain Computer Interfaces: An Adaptive Spatial Filtering Approach**
Leza Lahuerta, Cristina* *(Universidad Politecnica de Madrid)*; Puthusserypady, Sadasivan *(Technical University of Denmark)*

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**ThDT1-02:  16:10-17:10**                         Roentgen Hall
**Connectivity Analysis I** (Poster Session)

**16:10-16:12**                                    ThDT1-02.1
**Low-Latency VLSI Architecture for Neural Cross-Frequency Coupling Analysis**
O Leary, Gerard* *(University of Toronto)*; Valiante, Taufik A. *(University of Toronto)*; Genov, Roman *(University of Toronto)*

**16:12-16:14**                                    ThDT1-02.2
**Neuronal Desynchronization as Marker of an Impaired Brain Network**
Schulz, Steffen *(University of Applied Sciences Jena)*; Legorburu Cladera, Borja *(Universitat Politècnica de Catalunya)*; Giraldo, Beatriz *(Universitat Poiltècnica de Catalunya)*; Bolz, Mathias *(University Hospital Jena)*; Bär, Karl-Jürgen *(Friedrich-Schiller-University of Jena)*; Voss, Andreas* *(University of Applied Sciences Jena)*

**16:14-16:16**                                    ThDT1-02.3
**Coherence Analysis of Invasive Blood Pressure and Its Noninvasive Indicators for Improvement of Cuffless Measurement Accuracy**
Ding, Xiao-Rong *(The Chinese University of Hong Kong)*; Yan, Bryan P. *(Prince of Wales Hospital, The Chinese University of Hong Kong)*; Zhang, Yuan-Ting *(The Chinese University of Hong Kong)*; Liu, Jing *(The Chinese University of Hong Kong)*; Su, Peng *(The Chinese University of Hong Kong)*; Zhao, Ni* *(The Chinese University of Hong Kong)*

**16:16-16:18**                                    ThDT1-02.4
**Phase-Amplitude Coupling Analysis of Spontaneous EEG Activity in Alzheimer's Disease**
Poza, Jesus* *(University of Valladolid)*; Bachiller, Alejandro *(University of Valladolid)*; Gomez, Carlos *(University of Valladolid)*; Garcia, Maria *(University of Valladolid)*; Núñez, Pablo *(University of Valladolid)*; Gomez-Pilar, Javier *(University of Valladolid)*; Tola-Arribas, Miguel A. *(Dept. of Neurology, Hospital Universitario Río Hortega)*; Cano, Mónica *(Dept. of Clinical Neurophysiology, Hospital Universitario R)*; Hornero, Roberto *(University of Valladolid)*

**16:18-16:20**                                    ThDT1-02.5
**Study on the Effects of Brightness Contrast on Steady-State Motion Visual Evoked Potential**
Yan, Wenqiang *(Xi'an Jiaotong University)*; Xu, Guanghua* *(Xi'an Jiaotong University)*; Xie, Jun *(Xi'an Jiaotong University)*; Li, Min *(School of Mechanical Engineering, Xi'an Jiaotong University)*; Zhang, Sicong *(Xi'an Jiaotong University)*; Luo, Ailing *(Xi'an Jiaotong University)*

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**ThDT1-03:  16:10-17:10**                         Roentgen Hall
**Data Mining I** (Poster Session)

**16:10-16:12**                                    ThDT1-03.1
**Template-DTW based on Inertial Signals: Preliminary Results for Step Characterization**
Mantilla, Juan* *(Univ. Paris Descartes)*; Oudre, Laurent *(L2TI, Univ. Paris 13)*; Barrios, Rémi *(COGNAC G Univ. Paris Descartes)*; Vienne, Aliénor *(COGNACG, CNRS/SSA UMR 8257, Univ. Paris Descartes)*; Ricard, Damien *(COGNACG, CNRS/SSA UMR 8257, Univ. Paris Descartes)*

**16:12-16:14**                                    ThDT1-03.2
**Using Spatial Features for Classification of Combined Motions based on Common Spatial Pattern**
Lu, Huiyang *(School of Data and Computer Science, Sun Yat-sen Univ.)*; Zhang, Haoshi *(Shenzhen Institutes of Advanced Technology)*; Wang, Zhong *(School of Data and Computer Science, Sun Yat-sen Univ.)*; Wang, Ruomei *(School of Data and Computer Science, Sun Yat-sen Univ.)*; Li, Guanglin* *(Shenzhen Institutes of Advanced Technology)*

**16:14-16:16**                                    ThDT1-03.3
**Surgical Gesture Classification using Dynamic Time Warping and Affine Velocity**
Cifuentes Quintero, Jenny Alexandra *(Universidad Nacional de Colombia)*; Pham, Minh Tu* *(Institut National des Sciences Appliquées (INSA de Lyon))*; Moreau, Richard *(INSA-Lyon)*; Prieto, Flavio *(Unversidad Nacional de Colombia)*; Boulanger, Pierre *(University of Alberta)*

**16:16-16:18**                                    ThDT1-03.4
**Biological Tissues Identification from their Raman Spectral Signals Acquired by a Raman Needle**
Yang, Tangwen* *(Beijing Jiaotong University)*; Zheng, Jiawen *(Beijing Jiaotong University)*

**16:18-16:20**　　　　　　　　　　　　ThDT1-03.5
**Counting Malaria Parasites with a Two-Stage EM based Algorithm using Crowsourced Data**
Cabrera-Bean, Margarita* *(Univ. Politècnica de Catalunya, UPC, BarcelonaTECH)*; Pagès-Zamora, Alba *(Univ. Politècnica de Catalunya)*; Diaz-Vilor, Carles *(Univ. Politecnica de Catalunya)*; Postigo Camps, Maria *(Technical Univ. of Madrid)*; Cuadrado Sanchez, Daniel *(Technical Univ. of Madrid)*; Luengo-Oroz, Miguel Angel *(Univ. Politécnica de Madrid)*

**16:20-16:22**　　　　　　　　　　　　ThDT1-03.6
**Elastic Net based Sparse Feature Learning and Classification for Alzheimer's Disease Identification**
Wang, Ling *(University of Electronic Science and Technology of China)*; Liu, Yan* *(University of Chinese Academy of Sciences)*; Zeng, Xiangzhu *(Peking University Third Hospital, Beijing, China)*; Wang, Zheng *(Capital University of Medical Sciences)*

**16:22-16:24**　　　　　　　　　　　　ThDT1-03.7
**Reducing False Asystole Alarms in Intensive Care**
Dekimpe, Remi *(University Catholique de Louvain)*; Heldt, Thomas* *(Massachusetts Institute of Technology)*

ThDT1-04: 16:10-17:10　　　　　　　Roentgen Hall
**Nonlinear Dynamic Analysis III** (Poster Session)

**16:10-16:12**　　　　　　　　　　　　ThDT1-04.1
**Elimination of Power Line Interference from ECG Signals using Recurrent Neural Networks**
Qiu, Yue* *(Zhejiang University)*; Xiao, Feng *(Zhejiang University)*; Shen, Haibin *(Zhejiang University)*

**16:12-16:14**　　　　　　　　　　　　ThDT1-04.2
**A Novel Heart Rate Variability Analysis using Lagged Poincaré Plot: A Study on Hedonic Visual Elicitation**
Nardelli, Mimma *(University of Pisa)*; Greco, Alberto *(University of Pisa)*; Valenza, Gaetano *(University of Pisa)*; Lanata', Antonio *(University of Pisa)*; Bailon, Raquel *(University of Zaragoza)*; Scilingo, Enzo Pasquale* *(University of Pisa)*

**16:14-16:16**　　　　　　　　　　　　ThDT1-04.3
**Pressure Ulcer Risk Detection from Complexity of Activity**
Padhye, Nikhil* *(Univ of Texas Health Science Center)*; Bergstrom, Nancy *(The University of Texas Health Science Center at Houston)*; Rapp, Mary *(Retired)*; Etcher, LuAnn *(Spring Arbor University School of Human Services)*; Redeker, Nancy *(Yale School of Nursing)*

**16:16-16:18**　　　　　　　　　　　　ThDT1-04.4
**Feature Analysis of Dysphonia Speech for Monitoring Parkinson's Disease**
Rueda, Alice* *(Ryerson Univ.)*; Krishnan, Sridhar *(Ryerson Univ.)*

**16:18-16:20**　　　　　　　　　　　　ThDT1-04.5
**Heart Rate Variability in Patients with Major Depressive Disorder and Healthy Controls during Non-REM Sleep and REM Sleep**
Kwon, Hyunbin *(Seoul National Univ.)*; Yoon, Heenam *(Seoul National Univ.)*; Jung, Dawoon *(Seoul National Univ.)*; Choi, Sangho *(Seoul National Univ.)*; Choi, Jaewon *(Seoul National Univ. Hospital)*; Lee, Yujin *(Seoul National Univ. Hospital)*; Jeong, Do-Un *(Seoul National Univ. Hospital)*; Park, Kwang S.* *(Seoul National Univ.)*

**16:20-16:22**　　　　　　　　　　　　ThDT1-04.6
**Complexity Analysis of EEG under Magnetic Stimulation on Acupoint of Guangming (GB37)**
Geng, Yuehua* *(Hebei Univ. of Technology)*; Xing, Yangyang *(Hebei Univ. of Technology)*; Zhang, Xin *(Tianjin Polytechnic Univ.)*; Ge, Manling *(Hebei Univ. of Technology)*

**16:22-16:24**　　　　　　　　　　　　ThDT1-04.7
**Higuchi Fractal Dimension of the Electroencephalogram as a Biomarker for Early Detection of Alzheimer's Disease**
Al-nuaimi, Ali H. Husseen* *(Univ. of Plymouth)*; Jammeh, Emmanuel *(Plymouth Univ., School of Computing & Mathematics)*; Sun, Lingfen *(Plymouth Univ., School of Computing & Mathematics)*; Ifeachor, Emmanuel *(Univ. of Plymouth)*

**16:24-16:26**　　　　　　　　　　　　ThDT1-04.8
**Comparison of Different Shielding Methods in Acquisition of Physiological Signals**
Jiang, Yanbing *(Shenzhen Institutes of Advanced Tech.)*; Ji, Ning *(Shenzhen Institutes of Advanced Tech.)*; Wang, Hui *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Liu, Xueyu *(Chongqing University of Tech.)*; Geng, Yanjuan *(Shenzhen Institutes of Advanced Tech.)*; Li, Peng *(The Third Affiliated Hospital of Sun Yat-Sen University)*; Chen, Shixiong* *(Shenzhen Institutes of Advanced Tech.)*; Li, Guanglin *(Shenzhen Institutes of Advanced Tech.)*

**16:26-16:28**　　　　　　　　　　　　ThDT1-04.9
**Investigation of Lagged Poincaŕe Plot Reliability in Ultra-Short Synthetic and Experimental Heart Rate Variability Series**
Nardelli, Mimma *(University of Pisa)*; Greco, Alberto *(University of Pisa)*; Bolea, Juan *(Instituto de Investigación en Ingeniería de Aragón (I3A) Universi)*; Valenza, Gaetano *(University of Pisa)*; Scilingo, Enzo Pasquale* *(University of Pisa)*; Bailon, Raquel *(University of Zaragoza)*

ThDT2-01: 16:10-17:10　　　　　　　Cho Room
**Optical Imaging** (Poster Session)

**16:10-16:12**　　　　　　　　　　　　ThDT2-01.1
**Wound Scanning and Recovery Volume Prediction**
Kang, Juehyung *(Hanyang Univ.)*; Yoo, Hongki* *(Hanyang Univ.)*

**16:12-16:14**　　　　　　　　　　　　ThDT2-01.2
**Fiber-Based Rotary Joint for Ultra-High Resolution OCT**
Kim, JunYoung *(Hanyang University)*; Song, Joon Woo *(Guro Hospital, Korea University)*; Kim, Jin Won *(Korea University Guro Hospital)*; Yoo, Hongki* *(Hanyang University)*

**16:14-16:16**　　　　　　　　　　　　ThDT2-01.3
**Reflective Spectral Probe based on Microsphere**
Choi, Myunghwan* *(Sungkyunkwan University)*; Jo, Yongjae *(Sungkyunkwan University)*

**16:16-16:18**　　　　　　　　　　　　ThDT2-01.4
**Photoacoustic Imaging of Dental Implant**
Kim, Chulhong* *(Pohang University of Science and Technology)*; Lee, Donghyun *(POSTECH)*; Park, Sungjo *(POSTECH)*; Hyunjung, Kim *(POSTECH)*

**16:18-16:20**　　　　　　　　　　　　ThDT2-01.5
**Intravital Fluorescence Imaging of Reactive Oxygen Species in Murine Carotid Atherosclerotic Plaque**
Kim, Chang-Soo *(Hanyang University, Dept. of Biomedical Engineering)*; Park, Eun Jin *(Korea University Guro Hospital, Cardiovascular Center, Multimoda)*; Ryu, Jiheun *(Korea Advanced Institute of Science and Technology)*; Park, Kyeongsoon *(Chung-Ang University, Dept. of Systems Biotechnology)*; Kim, Jin Won *(Korea University Guro Hospital)*; Yoo, Hongki* *(Hanyang University)*

**16:20-16:22**　　　　　　　　　　　　ThDT2-01.6
**Development of Handheld Optical-Resolution Photoacoustic Probe**
Park, Kyungjin *(Pohang University of Science and Technology)*; Kim, Jin Young *(POSTECH)*; Lee, Changho *(Chonnam National University Medical School)*; Ryu, Seon Young *(POSTECH)*; Kim, Sehui *(POSTECH)*; Baik, Jin Woo *(Pohang University of Science and Technology)*; Kim, Jongbeom *(POSTECH)*; Kim, Chulhong* *(Pohang University of Science and Technology)*

**16:22-16:24**　　　　　　　　　　　　ThDT2-01.7
**Development of Indocyanine Green Fluorescence Imaging System using Near Infra-Red Light on Laparoscopic Surgery**
Park, Sunup *(OSONG Medical Innovation Foundation)*; Yoo, Sojeong *(OSONG Medical Innovation Foundation)*; Kang, Taegeon *(OSONG Medical Innovation Foundation)*; Kim, Seok-ki *(National Cancer Center)*; Lee, Seungrag* *(OSONG Medical Innovation Foundation)*

**16:24-16:26**                                              ThDT2-01.8
**Evaluation of Methods for Endoscopic 3D-Measurements using the Example of Endometriosis Diagnosis**
Schuldt, Dennis* *(University of Applied Sciences and Arts Dortmund)*; Sutorma, Andreas *(University of Applied Sciences and Arts Dortmund)*; Tanriverdi, Fatih *(University of Applied Sciences and Arts Dortmund)*; Thiem, Jörg *(University of Applied Sciences and Arts Dortmund)*

**16:26-16:28**                                              ThDT2-01.9
**Ex-Vivo Elasticity Assessment of Stroke Rat Brain using ARFI-OCE**
Chang, Yeon Hee *(DGIST)*; Kim, Jihun *(DGIST)*; Hwang, Jae Youn *(Daegu Gyeongbuk Institute of Science and Technology)*; Oh, Yong-Seok *(DGIST)*; Song, Cheol* *(DGIST)*

**16:28-16:30**                                              ThDT2-01.10
**Physically-Synthesized Porous Gold Nanoparticles for Biological Applications**
Wi, Jung-Sub* *(Korea Research Institute of Standards and Science)*; Park, Jisoo *(Korea Research Institute of Standards and Science)*; Kang, Heesung *(Korea Research Institute of Standards and Science)*; Lee, Sang-Won *(Korea Research Institute of Standards and Science)*; Lee, Tae Geol *(Korea Research Institute of Standards and Science)*

**ThDT2-02:  16:10-17:10**                              Cho Room
**Optical Imaging – Coherence Tomography** (Poster Session)

**16:10-16:12**                                              ThDT2-02.1
**Integrated Optical Coherence Tomography and Fluorescence Lifetime Imaging Catheter for Detecting Atherosclerotic Plaque in Vivo**
Lee, Min Woo *(Hanyang Univ.)*; Kang, Woo Jae *(KAIST)*; Nam, Hyeong Soo *(Hanyang Univ.)*; Song, Joon Woo *(Guro Hospital, Korea Univ.)*; Kim, Jin Won *(Korea Univ. Guro Hospital)*; Oh, Wang-Yuhl *(KAIST)*; Yoo, Hongki* *(Hanyang Univ.)*

**16:12-16:14**                                              ThDT2-02.2
**Visualization of Bioresorbable Vascular Scaffold Disruption by ECG-Triggered Ultra-High Speed OCT System and Investigation of Its Detrimental Effect on Arterial Healing by Integrated OCT/NIRF System**
Nam, Hyeong Soo *(Hanyang Univ.)*; Kim, Sunwon *(Korea Univ. Guro Hospital)*; Park, Hyun-Sang *(KAIST)*; Song, Joon Woo *(Guro Hospital, Korea Univ.)*; Oh, Wang-Yuhl *(KAIST)*; Kim, Jin Won *(Korea Univ. Guro Hospital)*; Yoo, Hongki* *(Hanyang Univ.)*

**16:14-16:16**                                              ThDT2-02.3
**Design and Fabrication of Gastrointestinal OCT Probe with Extended Depth of Focus**
Xing, Jingchao *(Hanyang Univ.)*; Yoo, Hongki* *(Hanyang Univ.)*

**ThDT2-03:  16:10-17:10**                              Cho Room
**Optical Imaging – Confocal Microscopy** (Poster Session)

**16:10-16:12**                                              ThDT2-03.1
**Boundary Detection Method in Skin Diseases by using Confocal Raman Micro-Spectroscopy**
Sohn, Wonbum *(Kyunghee University)*; Shin, Younggwan *(Kyung Hee University)*; Kim, Soogeun *(Kyung Hee University)*; Lee, Soo Yeol* *(Kyung Hee University)*

**ThDT2-04:  16:10-17:10**                              Cho Room
**Optical Imaging and Microscopy – Fluorescence Microscopy** (Poster Session)

**16:10-16:12**                                              ThDT2-04.1
**Automatic Segmentation of Z-Lines in Cardiac Cells from Microscope Fluorescence Images**
Nolla-Colomer, Carme* *(Universitat Politècnica de Catalunya)*; Vallmitjana, Alex *(Automatic Control Dept., Universitat Politecnica de Catalun)*; Marchena, Miquel *(Universitat Politècnica de Catalunya)*; Echebarria, Blas *(Universitat Politècnica de Catalunya)*; Herrainz, Adela *(Cardiovascular Research Center from the Spanish National Researc)*; Hove-Madsen, Leif *(Cardiovascular Research Center from the Spanish National Researc)*; Chen, S.R. Wayne *(University of Calgary)*; Benitez, Raul *(Universitat Politecnica de Catalunya)*

**ThDT2-05:  16:10-17:10**                              Cho Room
**Optical Imaging and Microscopy – Microscopy** (Poster Session)

**16:10-16:12**                                              ThDT2-05.1
**HerNet: An Automated HER-2 Scoring Tool for Breast Cancer Screening using Deep Learning**
Saha, Monjoy* *(Indian Institute of Technology Kharagpur)*; Arun, Indu *(TMC, West Bengal)*; Chakraborty, Chandan *(Indian Institute of Technology, Kharagpur)*

**16:12-16:14**                                              ThDT2-05.2
**3D Position Detection of Cell Nuclei in Hematoxylin -Stained Histological Sections**
Takano, Masashi *(Shibaura Institute of Technology)*; Takahashi, Masanobu* *(Shibaura Institute of Technology)*; Nakano, Masayuki *(Shonan Fujisawa Tokushukai Hospital)*

**16:14-16:16**                                              ThDT2-05.3
**Skin Cell Heat Damage Evaluation for the Safety of Laser Medical Devices**
Katagiri, Wataru* *(Keio Univ. Graduate School of Science and Tech.)*; Nyberg, Tobias *(Royal Institute of Tech., Sweden)*

**ThDT2-06:  16:10-17:10**                              Cho Room
**Optical Imaging and Microscopy – Multi Photon Imaging** (Poster Session)

**16:10-16:12**                                              ThDT2-06.1
**Microfluidics-on-a-Tongue Imaging Chamber for Taste Mapping in Vivo**
Han, Jisoo *(Sungkyunkwan University)*; Choi, Myunghwan* *(Sungkyunkwan University)*

**16:12-16:14**                                              ThDT2-06.2
**Real-Time Two-Photon Fluorescence Lifetime Imaging Microscopy for Deep-Tissue Tomography**
Ryu, Jiheun* *(Korea Advance Institute of Science and Technology (KAIST))*; Jeong, Jae-Heon *(Korea Advanced Institute of Science and Technology (KAIST))*; Yoo, Hongki *(Hanyang University)*; Gweon, Dae-Gab *(Korea Advanced Institute of Science and Technology (KAIST))*

**ThDT2-07:  16:10-17:10**                              Cho Room
**Optical Imaging and Microscopy – Near Infra-Red Spectroscopy** (Poster Session)

**16:10-16:12**                                              ThDT2-07.1
**Measurement of Brain Hemodynamic Change According to Dietary Intake using Near-Infrared Spectroscopy**
Fukuda, Keiko* *(Tokyo Metropolitan College of Industrial Technology)*; Yuki, Muramatsu *(Tokyo Metropolitan College of Industrial Technology)*; Hasegawa, Masahiro *(Tokyo Metropolitan College of Industrial Technology)*

**16:12-16:14**                                              ThDT2-07.2
**Design of an Endoscope for Thermal Inspection**
Kim, Keo-Sik* *(Electronics and Telecommunications Research Institute (ETRI))*; Min, Gihyeon *(Electronics and Telecommunications Research Institute (ETRI))*; Son, Dong Hoon *(Electronics and Telecommunications Research Institute (ETRI))*; Kang, Hyun Seo *(Electronics and Telecommunications Research Institute (ETRI))*; Kim, Sung Chang *(Electronics and Telecommunications Research Institute (ETRI))*

**ThDT2-08:  16:10-17:10**                              Cho Room
**Optical Imaging and Microscopy – Neuroimaging** (Poster Session)

**16:10-16:12**                                              ThDT2-08.1
**Spectral Reflectometry on the Myelinated Axon**
Kwon, Junhwan *(Center for Neuroscience Imaging Research, Inst. of Basic Sci)*; Choi, Myunghwan* *(Sungkyunkwan Univ.)*

**16:12-16:14**                                              ThDT2-08.2
**Simultaneous Optical and Electrical Measurements of Neural Activities from Clustered Neural Networks**
Kim, Raeyoung *(KAIST)*; Nam, Yoonkey* *(Korea Advanced Institute of Science and Technology)*

**ThDT3-01：16:10-17:10**
**Cardiac Imaging and Image Analysis** (Poster Session)

16:10-16:12                  ThDT3-01.1
**Cardiac Cycle Phase Classification for Four-Dimensional Imaging of Zebrafish Embryos**
He, Hengda *(School of Optical and Electronic Info., Huazhong Univ.)*; Cheng, Chang-Chieh\* *(Natl. Chiao Tung Univ.)*; Chen, Yen-Ling *(Dept. of Applied Chemistry and Dept. of Biological Sci)*; Liau, Ian *(Dept. of Applied Chemistry and Institute of Molecular Scien)*; Ching, YuTai *(Natl. Chiao Tung Univ.)*

16:12-16:14                  ThDT3-01.2
**Fully Automated Lumen Morphology Segmentation and 3D Reconstruction Algorithms for Optical Coherence Tomography**
Yang, Su *(Keimyung University)*; Yoon, Hyuck-Jun *(Keimyung University)*; Kim, Seon-Chil *(Keimyung University)*; Lee, Jong-Ha\* *(Keimyung University, School of Medicine)*

16:14-16:16                  ThDT3-01.3
**An Interactive Biventricular Modelling Tool using Subdivision Surface: Application to Congenital Heart Disease**
Mauger, Charlène Alice\* *(University of Auckland)*; Gilbert, Kathleen *(University of Auckland)*; Cowan, Brett *(University of Auckland)*; Suinesiaputra, Avan *(University of Auckland)*; Young, Alistair *(University of Auckland)*

**ThDT3-02：16:10-17:10**
**Dual-Energy X-Ray Imaging** (Poster Session)

16:10-16:12                  ThDT3-02.1
**Dual Energy-Based Metal Segmentation for Metal Artifact Reduction in Dental Computed Tomography**
Hegazy, Mohamed Abdalla Ahmed\* *(Dept. of Biomed Eng., Kyung Hee Univ.)*; Eldib, Mohamed Elsayed *(Dept. of Biomed Eng., Kyung Hee Univ.)*; Hernandez, Daniel *(Kyung Hee Univ.)*; Lee, Jeong Seok *(Korea Electrotechnology Research Institute)*; Mun, Yang Ji *(Dept. of Biomed Eng., Kyung Hee Univ.)*; Cho, Myung Hye *(Dept. of Biomed Eng., Kyung Hee Univ.)*; Cho, Min Hyoung *(Kyung Hee Univ.)*; Lee, Soo Yeol *(Kyung Hee Univ.)*

**ThDT3-03：16:10-17:10**
**EEG Imaging** (Poster Session)

16:10-16:12                  ThDT3-03.1
**SigViewer: Visualizing Multimodal Signals Stored in XDF (Extensible Data Format) Files**
Lin, Yida *(Columbia Univ.)*; Brunner, Clemens\* *(Univ. of Graz)*; Sajda, Paul *(Columbia Univ.)*; Faller, Josef *(Columbia Univ.)*

16:12-16:14                  ThDT3-03.2
**A Comparison of Single-Trial EEG Classification and EEG-Informed fMRI across Three MR Compatible EEG Recording Systems**
Faller, Josef\* *(Columbia University)*; Hong, Linbi *(Columbia University)*; Cummings, Jennifer *(Columbia University)*; Sajda, Paul *(Columbia University)*

16:14-16:16                  ThDT3-03.3
**Second Order Blind Identification and Support Vector Machine Technique towards Imagery Movement Identification from EEG Signals**
Kalogiannis, Gregory *(Aristotle University of Thessaloniki)*; Hassapis, George\* *(Aristotle University of Thesaloniki)*

**ThDT3-04：16:10-17:10**
**Micro-CT Imaging** (Poster Session)

16:10-16:12                  ThDT3-04.1
**Automatic Optimization of Segmentation-Free Empirical Beam Hardening Correction**
Mun, Yang Ji\* *(Dept. of Biomed Engineering, Kyung Hee Univ.)*; Hernandez, Daniel *(Kyung Hee Univ.)*; Hegazy, Mohamed Abdalla Ahmed *(Dept. of Biomed Engineering, Kyung Hee Univ.)*; Eldib, Mohamed Elsayed *(Dept. of Biomed Engineering, Kyung Hee Univ.)*; Cho, Min Hyoung *(Kyung Hee Univ.)*; Lee, Soo Yeol *(Kyung Hee Univ.)*

16:12-16:14                  ThDT3-04.2
**Ring Artifact Correction using Entropy Minimization**
Eldib, Mohamed Elsayed\* *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Hegazy, Mohamed Abdalla Ahmed *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Hernandez, Daniel *(Kyung Hee Univ.)*; Lee, Jeong Seok *(Korea Electrotechnology Research Institute)*; Mun, Yang Ji *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Cho, Myung Hye *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Cho, Min Hyoung *(Kyung Hee Univ.)*; Lee, Soo Yeol *(Kyung Hee Univ.)*

16:14-16:16                  ThDT3-04.3
**Automatic Geometric Calibration for Cone Beam Micro-CT**
Hernandez, Daniel\* *(Kyung Hee Univ.)*; Eldib, Mohamed Elsayed *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Hegazy, Mohamed Abdalla Ahmed *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*; Cho, Min Hyoung *(Kyung Hee Univ.)*; Lee, Soo Yeol *(Kyung Hee Univ.)*; Mun, Yang Ji *(Dept. of Biomedical Engineering, Kyung Hee Univ.)*

**ThDT3-05：16:10-17:10**
**PET and SPECT Imaging** (Poster Session)

16:10-16:12                  ThDT3-05.1
**Intracranial-Electrophysiologic Correlates of Cerebral Glucose Metabolic Abnormalities in Pediatric Epilepsy**
Jeong, Jeong-Won\* *(Wayne State Univ. School of Medicine)*; Asano, Eishi *(Depts of Pediatrics and Neurology, Wayne State Univ.)*; Juhasz, Csaba *(Wayne State Univ. School of Medicine)*

16:12-16:14                  ThDT3-05.2
**Using Cherenkov Radiation for Vertex Detection in a Compton Camera Setup for Nuclear Imaging**
Mielke, Matthias\* *(Univ. of Siegen)*; Brück, Rainer *(Univ. of Siegen)*; Fleck, Ivor *(Univ. Siegen, Dept. of Physics)*

16:14-16:16                  ThDT3-05.3
**Precise System Modeling for Image Reconstruction of Preclinical Quad-Head PET**
Lee, Sooyoung *(Korea Univ.)*; Bae, Seungbin *(ARALE Laboratory)*; Kim, Kwangdon *(Korea Univ.)*; Bae, Jaekeon *(Korea Institute of Radiological Medical Sciences)*; Lee, Hakjae *(Korea Univ.)*; Kim, Kyeong Min *(Korea Institute of Radiological and Medical Sciences)*; Lee, Kisung\* *(Korea Univ.)*

16:16-16:18                  ThDT3-05.4
**Feasibility Study of Data Acquisition System based on Oscilloscope for Radiation Detector**
Yang, Jingue *(Chonnam National University)*; Kang, Jihoon\* *(Chonnam National University)*

16:18-16:20                  ThDT3-05.5
**Evaluation of Single Photon Emission Computed Tomography/Computed Tomography (SPECT/CT) Image Applying to Three-Dimensional Printing Phantom**
Lee, Jooyoung *(Chungbuk National University, Songho College)*; Park, Hoon-Hee *(377 Gwangmyeong-ro, Seongnam, Shingu College)*; Lee, Tae Soo\* *(Chungbuk National University)*

16:20-16:22                  ThDT3-05.6
**Improved Patch-Based Maximum a Posteriori Reconstruction for Positron Emission Tomography**
Ren, Xue *(Paichai Univ.)*; Lee, Soo-Jin\* *(Paichai Univ.)*

**ThDT3-06：16:10-17:10**
**PET and SPECT Imaging Applications** (Poster Session)

16:10-16:12                  ThDT3-06.1
**Non-Invasive and Direct Measurement of Arterial Radioactivity using Scintillator Detectors**
Kim, Bo Kyoung *(Gachon Univ.)*; Jeong, Bong Hyuk *(Gachon Univ.)*; Kim, Jaeseung *(Gachon Univ.)*; Lee, Yongki *(Dongnam health univ.)*; Son, Young Don\* *(Gachon Univ.)*

16:12-16:14                  ThDT3-06.2
**Side-Readout Radiation Detector based on GAPD and LYSO for Hand-Held Radiation Imager**
Han, Sookyeong *(Chonnam National University)*; Kang, Jihoon\* *(Chonnam National University)*

**16:14-16:16**  ThDT3-06.3

**Comparison of 18F-FDG PET/CT Standardized Uptake Values**

Park, Hoon-Hee* *(377 Gwangmyeong-ro, Seongnam, Shingu College)*; Lee, Jooyoung *(Chungbuk National University, Songho College)*; Lee, Tae Soo *(Chungbuk National University)*

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**ThDT3-07:**  16:10-17:10

**X-Ray – Fluoroscopy** (Poster Session)

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**16:10-16:12**  ThDT3-07.1

**Distance-Weighted and Normalized Correlation Coefficient based Algorithm for Tracking Hyoid Bone**

Kim, Hang-Keun* *(Gachon Univ.)*; Kim, Taejin *(Gachon Univ.)*; Park, Soyun *(Gachon Univ.)*; Cho, Hyeon *(Gachon Univ.)*; Son, Young Don *(Gachon Univ.)*; Moon, Jong Hoon *(Gachon Univ.)*; Cho, Hwi-young *(Gachon Univ.)*

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**ThDT3-08:**  16:10-17:10

**X-Ray CT Imaging** (Poster Session)

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**16:10-16:12**  ThDT3-08.1

**Determination of the Optimal Projection Angles of Coronary Artery Bifurcation for Stent Placement based on Coronary Computed Tomographic Angiography**

Lin, Yi-Chen* *(Natl. Taiwan Univ.)*; Wang, Tzung-Dau *(Cardiovascular Center and Division of Cardiology)*; Lee, Wen-Jeng *(Dept. of Medical Imaging, Natl. Taiwan Univ. Hospital)*; Ko, Wei-Chun *(Natl. Taiwan Univ. Hospital)*; Hung, Wei-Hsin *(Natl. Taiwan Univ.)*; Chen, Chung-Ming *(Natl. Taiwan Univ.)*

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**16:12-16:14**  ThDT3-08.2

**Application of Calcium Subtraction Method to Phantom Image Including Motion Artifact in M-DCT**

Lee, Jongmin* *(Kyungpook National Univ.)*; Park, YuJin *(Kyungpook National Univ.)*; Kim, Junghun *(Kyungpook National Univ.,)*; Park, Jieun *(Kyungpook National Univ.)*

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**16:14-16:16**  ThDT3-08.3

**A Novel High Precision Measurement Method for Small Airway Wall Thickness in CT Imaging**

Yang, Zepa *(Seoul National University)*; Jin, Hyeongmin *(Seoul National University)*; Heo, Changyong *(Seoul National University)*; Kim, Jong Hyo* *(Seoul National University)*

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**16:16-16:18**  ThDT3-08.4

**Evaluation of Natural Head Position Reproduction Accuracy of Cone Beam Computed Tomography Image using Three-Dimensional Structured Light Scanner**

Choi, Min Hyuk *(Seoul National Univ.)*; Lee, Sang Jeong *(Seoul National Univ.)*; Woo, Sang-Yoon *(Seoul National Univ.)*; Yoo, Ji Yong *(Seoul National Univ.)*; Kang, Se Ryong *(Seoul National Univ.)*; Yi, WonJin* *(Seoul National Univ Sch of Dentistry)*

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**16:18-16:20**  ThDT3-08.5

**Radiomic Analysis of Pulmonary Adenocarcionomas on CT Images**

Odo, Tsukasa* *(Yamaguchi University)*; Kido, Shoji *(Graduate School of Science and Technology for Innovation, Yamagu)*; Hirano, Yasushi *(Yamaguchi University)*; Hashimoto, Noriaki *(Yamaguchi University)*; Tanaka, Nobuyuki *(Saiseikai Yamaguchi General Hospital)*

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**16:20-16:22**  ThDT3-08.6

**Improved Median-Regularized Transmission Reconstruction using Incremental Optimization Transfer Algorithm**

Jung, Ji Eun *(Paichai University and Kumamoto University)*; Lee, Soo-Jin* *(Paichai University)*

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**ThDT3-09:**  16:10-17:10

**X-Ray Imaging Applications** (Poster Session)

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**16:10-16:12**  ThDT3-09.1

**Effect of Detector Energy Resolution on Detection Limit of Gold Nanoparticles during Benchtop X-Ray Fluorescence Computed Tomography (XFCT)**

Manohar, Nivedh *(Georgia Institute of Technology)*; Reynoso, Francisco *(Washington University in St. Louis)*; Cho, Sang Hyun* *(The University of Texas MD Anderson Cancer Center)*

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**16:12-16:14**  ThDT3-09.2

**Development and Verification of a Reference Phantom for Certified Length in Medical Image**

Kim, Hojae *(Yonsei University)*; Hong, Cheolpyo *(Catholic University of Daegu)*; Teo-Jeon, Shin *(Dep. Pediatric dentistry, Seoul National University, School of D)*; Hee-Joung, Kim *(Yonsei University)*; Cho, Hyo-Min* *(KRISS)*

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**16:14-16:16**  ThDT3-09.3

**An Artifact Reduction Evaluation in INER Prototype Tomosynthesis**

Shen, Yu-Hsiang* *(Inst. of Nuclear Energy Research, Taiwan)*; Tseng, Fan-Pin *(Inst. of Nuclear Energy Research, Taiwan)*; Lin, Chia-Yu *(Inst. of Nuclear Energy Research, Taiwan)*; Chang, Chia-Hao *(Inst. of Nuclear Energy Research, Taiwan)*; Ni, Yu-Ching *(Inst. of Nuclear Energy Research, Taiwan)*; Tseng, Sheng-Pin *(Inst. of Nuclear Energy Research, Taiwan)*

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**ThDT4-01:**  16:10-17:10  Min Room

**Integrated Wearable Systems I** (Poster Session)

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**16:10-16:12**  ThDT4-01.1

**Noninvasive Hemoglobin Measurement using Unmodified Smartphone Camera and White Flash**

Wang, Edward* *(University of Washington)*; Li, William *(University of Washington)*; Zhu, Junyi *(University of Washington)*; Rana, Rajneil *(University of Washington)*; Patel, Shwetak *(University of Washington)*

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**16:12-16:14**  ThDT4-01.2

**Development of a Portable Sensorised Handle for the Objective Assessment of the Effectiveness and Concordance of Intervention Plans in Dementia**

Ma, Jianjia* *(Loughborough University)*; Zecca, Massimiliano *(Loughborough University)*

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**16:14-16:16**  ThDT4-01.3

**Personalized Cumulative UV Tracking on Mobiles and Wearables**

Dey, Soumyabrata *(Samsung R & D Institute, Bangalore, India)*; Sahoo, Saswata *(Samsung R & D Institute, Bangalore, India)*; Agrawal, Harshit *(Samsung Research Institute Bangalore)*; Mondal, Arindam *(Samsung R&D Institute India Bangalore)*; Bhowmik, Tanmoy* *(Samsung Research Institute)*; Tiwari, Vijay Narayan *(Samsung Research India, Banglore)*

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**16:16-16:18**  ThDT4-01.4

**A Gaussian Process Regression Model for Walking Speed Estimation using a Head-Worn IMU**

Zihajehzadeh, Shaghayegh* *(PhD Student, Simon Fraser University)*; Tae, Chul-Gyu *(Bigmotion Technologies)*; Park, Edward J. *(Simon Fraser University)*

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**16:18-16:20**  ThDT4-01.5

**Wearable Bio Signal Monitoring System Applied to Aviation Safety**

Kim, Sungho *(Air Force Academy)*; Choi, Booyong *(Air Force Academy)*; Cho, Taehwan *(Air Force Academy)*; Lee, Yongkyun *(Air Force Academy)*; Koo, Hyojin *(Air Force Academy)*; Kim, Dongsoo* *(Air Force Academy)*

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**ThDT4-02:**  16:10-17:10  Min Room

**Wearable Sensing I** (Poster Session)

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**16:10-16:12**  ThDT4-02.1

**A Simple Algorithm for Emotion Recognition, using Physiological Signals of a Smart Watch**

Pollreisz, David *(TU Wien)*; TaheriNejad, Nima* *(TU Wien)*

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**16:12-16:14**  ThDT4-02.2

**A Prospective Study of Examining Physiological Signals for Estimating Occurrence of Nocturnal Enuresis**

Moon, Junhyung* *(Yonsei Univ.)*; Lee, Sangyeop *(Yonsei Univ.)*; Lee, Taeho *(Yonsei Univ.)*; Kye, Saewon *(Yonsei Univ.)*; Lee, Yong Seung *(Yonsei Univ.)*; Shin, Seung-chul *(Yonsei Univ.)*; Lee, Kyoungwoo *(Yonsei Univ.)*

**16:14-16:16**  ThDT4-02.3

**Wearable Internet of Things – From Human Activity Tracking to Clinical Integration**

Kumari, Poonam *(Kyung Hee University)*; Loópez-Beniítez, Miguel *(University of Liverpool)*; Lee, Gyu Myoung *(Liverpool John Moores University)*; Kim, Tae-Seong *(Kyung Hee University)*; Minhas, Atul Singh\* *(University of Liverpool)*

**16:16-16:18**  ThDT4-02.4

**Reconstructing Physical Activity Monitoring Outcome Measures using an Interval Sampling Approach**

Amor, James *(University of Warwick)*; James, Christopher\* *(University of Warwick)*

**16:18-16:20**  ThDT4-02.5

**Levels of Activity Identification and Sleep Duration Detection with a Wrist-Worn Accelerometer-Based Device**

Verma, Vijay Kumar\* *(Chang Gung University)*; Lin, Wen-Yen *(Chang Gung University)*; Lee, Ming-Yih *(Chang Gung University)*; Lai, Chao-Sung *(Chang Gung University)*

**16:20-16:22**  ThDT4-02.6

**A Monitoring System for Walking Rehabilitation after THR or TKR Surgeries**

Zheng, Qianpeng *(Tsinghua Univ.)*; Chen, Hong\* *(Tsinghua Univ.)*

**16:22-16:24**  ThDT4-02.7

**A Wearable Sensor based Multi-Criteria-Decision-System for Real-Time Seizure Detection**

Ahmed, Abdullah *(National University of Sciences and Technology)*; Ahmad, Waqas *(NUST)*; Khan, Muhammad Jazib *(National University of Sciences and Technology)*; Siddiqui, Shoaib Ahmed *(National University of Sciences and Technology)*; Cheema, Hammad M.\* *(School of Electrical Engineering and Computer Science, National)*

**16:24-16:26**  ThDT4-02.8

**A Novel Method to Monitor Human Stress States using Ultra-Short-Term ECG Spectral Feature**

Hwang, Bosun *(Seoul National University)*; Ryu, Ji Woo *(Kwangwoon University)*; Park, Cheolsoo *(Imperial College London)*; Zhang, Byoung-Tak\* *(Seoul National University)*

**16:26-16:28**  ThDT4-02.9

**A Wearable Action Recognition System based on Acceleration and Attitude Angles using Real-Time Detection Algorithm**

Zhao, Guoru\* *(Shenzhen Institutes of Advanced Tech. Chinese Academy of Sci)*; Wang, Bo *(Wuhan University of Tech.)*; Liang, Shengyun *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Ni, Xie *(Core Laboratory, Shenzhen Second People's Hospital, First Affili)*; Ma, Yingnan *(Beijing Research Center of Urban System Engineering)*; Gao, Xing *(Beijing Research Center of Urban System Engineering)*

**ThDT4-03: 16:10-17:10**  Min Room
**Wearable Systems I** (Poster Session)

**16:10-16:12**  ThDT4-03.1

**IoT/M2M Wearable-Based Activity-Calorie Monitoring and Analysis for Elders**

Soraya, Sabrina Ifahdini *(National Chiao Tung University)*; Chiang, Ting-Hui *(National Chiao Tung University)*; Chan, Guo-Jing *(National Chiao Tung University)*; Su, Yi-Juan *(National Chiao Tung University)*; Yi, Chih-Wei *(National Chiao Tung University)*; Tseng, Yu-Chee *(National Chiao Tung University)*; Ching, YuTai\* *(National Chiao Tung University)*

**16:12-16:14**  ThDT4-03.2

**High-Density Ear-EEG**

Kappel, Simon Lind\* *(Aarhus University, Denmark)*; Kidmose, Preben *(Aarhus University, Denmark)*

**16:14-16:16**  ThDT4-03.3

**A Model based Analysis of Optimality of Sit-to-Stand Transition**

Madhushri, Priyanka *(University of Alabama in Huntsville)*; Jovanov, Emil\* *(University of Alabama in Huntsville)*; Milenkovic, Aleksandar *(University of Alabama in Huntsville)*; Shtessel, Yuri *(University of Alabama in Huntsville)*

**16:16-16:18**  ThDT4-03.4

**A Novel, Low Cost, Wearable Contact-Based Device for Breathing Frequency Monitoring**

Cesareo, Ambra\* *(Dipartimento di Elettronica, Informazione e Bioingegneria, Polit)*; Gandolfi, Stefano *(Dipartimento di Elettronica, Informazione e Bioingegneria, Polit)*; Pini, Ilaria *(Dipartimento di Elettronica, Informazione e Bioingegneria, Polit)*; Biffi, Emilia *(Scientific Institute Eugenio Medea, Bosisio Parini)*; Reni, Gianluigi *(IRCCS)*; Aliverti, Andrea *(Politecnico di Milano)*

**16:18-16:20**  ThDT4-03.5

**Gait Speed Estimation using Kalman Filtering on Inertial Measurement Unit Data**

Alam, Md Nafiul *(University of North Dakota)*; Munia, Tamanna Tabassum Khan *(University of North Dakota)*; Fazel-Rezai, Reza\* *(University of North Dakota)*

**16:20-16:22**  ThDT4-03.6

**Patient Cloth with Motion Recognition Sensors based on Flexible Piezoelectric Materials**

Cha, Youngsu\* *(Korea Institute of Science and Technology)*; Nam, Kihyuk *(Korea Institute of Science and Technology)*; Kim, Doik *(Korea Institute of Science and Technology)*

**16:22-16:24**  ThDT4-03.7

**Towards an IoT-Based Upper Limb Rehabilitation Assessment System**

Jiang, Yizhou *(Fudan Univ.)*; Qin, Yajie\* *(Fudan Univ.)*; Kim, IkHwan *(Fudan Univ.)*; Wang, Yuanyuan *(Fudan Univ.)*

**16:24-16:26**  ThDT4-03.8

**Experimental Characterization and Analysis of the BITalino Platforms against a Reference Device**

Batista, Diana\* *(Instituto Superior Técnico)*; Plácido da Silva, Hugo *(IST - Instituto Superior Técnico)*; Fred, Ana *(IT - Instituto de Telecomunicações)*

**16:26-16:28**  ThDT4-03.9

**Wearable PPG Sensor based Alertness Scoring System**

Dey, Jishnu *(Samsung R&D Institute India, Bangalore)*; Bhowmik, Tanmoy\* *(Samsung Research Institute)*; Sahoo, Saswata *(Samsung R & D Institute, Bangalore, India)*; Tiwari, Vijay Narayan *(Samsung Research India, Banglore)*

**16:28-16:30**  ThDT4-03.10

**Impedance Spectroscopy of Tripolar Concentric Ring Electrodes with Ten20 and TD246 Pastes**

Nasrollaholhosseini, Seyed Hadi\* *(University of Rhode Island)*; Besio, W. G. *(University of Rhode Island)*; Salazar Herrera, Daniel *(University of Rhode Island)*

**ThDT5-01: 16:10-17:10**  Lee Room
**Bio-Electric Sensors – Sensing Methods** (Poster Session)

**16:10-16:12**  ThDT5-01.1

**Bioengineered Enzymatic Electrochemical Glucose Sensor Composed of Well Dispersed Functionalized Multiwall Carbon Nanotubes in Nafion Doped with Polypyrrole Globular Arrays**

Shrestha, Bishnu\* *(Chonbuk National Univ.)*; Shrestha, Sita *(Chonbuk National Univ.)*; Bhattarai, Deval Prasad *(Chonbuk National Univ.)*; Park, Chan Hee *(Chonbuk National Univ.)*; Kim, Cheol Sang *(Chonbuk National Univ.)*

**16:12-16:14**  ThDT5-01.2

**A Facile and Reusable Computer Numeric Control-Milled Micro-fluidic Platform for Colorimetric and Biochemical Analysis**

Lee, Seung Ho *(Kyung Hee Univ.)*; Kim, Wansun *(Kyung Hee Univ.)*; Ahn, Yong Jin *(Kyung Hee Univ.)*; Park, Hun-Kuk *(Kyung Hee Univ.)*; Choi, Samjin\* *(Kyung Hee Univ.)*

**16:14-16:16**  ThDT5-01.3

**An Advanced Contact Resistance Compensation Method towards Wearable Bioelectrical Impedance Analyzer with Miniature Electrodes**

Jung, Myoung Hoon *(Samsung Advanced Institute of Tech.)*; Namkoong, Kak\* *(Samsung Advanced Institute of Tech., Samsung Electronics Co)*

**16:16-16:18**                                    ThDT5-01.4
**Highly Sensitive Self-Powered Glucose Biosensor**
Kulkarni, Tanmay *(University of Maryland Baltimore County)*;
Slaughter, Gymama\* *(University of Maryland Baltimore County)*

**16:18-16:20**                                    ThDT5-01.5
**Optimization of Electrical Conductivity of Thermally-Drawn SU-8/MWCNT Composite Microprobes for Biosensing**
Yang, DaSom *(Yonsei University)*; Shin, Hye In *(Yonsei University)*; Ryu, WonHyoung\* *(Yonsei University)*

**16:20-16:22**                                    ThDT5-01.6
**Comparison of Electrode Materials for Pasteless EEG Recording in the Ear**
Kim, Do Youn *(Interdisciplinary Program, Bioeng., Graduate School, Seou)*; Ku, Yunseo *(Seul Natl. Univ., Samsung Advanced Inst. of Tech.)*; Ahn, J.W. *(Seoul Natl. Univ.)*; Sohn, J. *(Seoul Natl. Univ.)*; Kim, H.C.\* *(Seoul Natl. Univ.)*

**16:22-16:24**                                    ThDT5-01.7
**A Differential Ion-Sensitive Sensor with Wide Dynamic Range**
Lee, Kang-Ho\* *(Korea Institute of Machinery & Materials)*; Lee, Dongkyu *(Korea Institute of Machinery & Materials)*; Yoon, Jongsu *(Korea Institute of Machinery & Materials)*; Kwon, Ohwon *(Korea Institute of Machinery & Materials)*; Lee, Jaejong *(Korea Institute of Machinery & Materials)*

**16:24-16:26**                                    ThDT5-01.8
**A Rapid Method for Determining the Erythrocyte Sedimentation Rate, Aggregation, Hematocrit and Dielectric Properties of Blood**
Zhbanov, Alexander *(Gwangju Institute of Science and Technology (GIST))*; Yang, Sung\* *(Gwangju Institute of Science and Technology (GIST))*

**16:26-16:28**                                    ThDT5-01.9
**Development of a Magnetoencephalography System and Sensor Configuration Analysis for Rats**
Kim, Ji-Eun *(Korea research Inst. of standards and science)*; Kim, InSeon *(Korea Research Inst. of Standards and Science)*; Kim, Kiwoong\* *(Korea Research Inst. of Standards and Science)*; Lim, Sanghyun *(Korea Research Inst. of Standards and Science (KRISS) and Un)*; Kwon, Hyuk Chan *(Korea Research Inst. of Standards and Science)*; Yu, Kwon Kyu *(Korea Research Inst. of Standards and Science)*; Lee, Yong Ho *(Korea Research Inst. of Standards and Science)*

**16:28-16:30**                                    ThDT5-01.10
**Interdigitated and Chain-Shaped Electrode for Real-Time Monitoring of Sodium Selenite Cytotoxicity on HEK 293/GFP Cells**
Park, Jinsoo *(Gachon Advanced Institute for Health Science and Technology(GAIH)*; Reddy, Chinnadayyala Somasekhar *(Gachon University)*; Cho, Sungbo\* *(Gachon Univ.)*

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**ThDT5-02:  16:10-17:10**                          Lee Room
**Bio-Electric Sensors – Sensor Systems** (Poster Session)

**16:10-16:12**                                    ThDT5-02.1
**An Electrochemical Immunosensor for Detection of Pepsin Utilizing Gold/Polypyrrole Nanocorals**
Lee, Doyeon *(Kyung Hee Univ.)*; Ahn, Yong Jin *(Kyung Hee Univ.)*; Lee, Jaemyeon *(Kyunghee Univ.)*; Lee, Young Ju *(Kyung Hee Univ.)*; Lee, Gi-Ja\* *(Kyung Hee Univ.)*

**16:12-16:14**                                    ThDT5-02.2
**Verification of Novel Electrochemical Detection Method for Aptamer-Based Biosensors**
Yoo, Hyun Ji *(Ewha Womans Univ.)*; Ji, Chang-Hyeon *(Ewha Womans Univ.)*; Jun, Sang Beom\* *(Ewha Womans Univ.)*

**16:14-16:16**                                    ThDT5-02.3
**Development of Assessment Guidelines for Analytical Performance of POCT Type Hemoglobin Analyzer**
Lee, Seung-ro\* *(Ministry of Food and Drug Safety)*; Min, Hye-kyoung *(Ministry of Food and Drug Safety)*; Kim, Bora *(Ministry of Food and Drug Safety)*; Kim, Jieun *(Ministry of Food and Drug Safety)*; Park, Chang Won *(National Institute of Food and Drug Safety Evaluation, Ministry)*

**16:16-16:18**                                    ThDT5-02.4
**High Resolution Raman 3D Mapping for Nondestructive Analysis of Single Wall Carbon Nanotube Immobilized Transparent Electrodes**
Kim, Joong Hyun\* *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Chung, Chan Ho *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Seo, Hyukjun *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Lee, Dong uk *(Daegu-Gyeongbuk Medical Innovation Foundation)*

**16:18-16:20**                                    ThDT5-02.5
**A Novel Blood Pressure Estimation using Pulse Transit Time and Impedance Plethysmography**
Huynh, Huu Toan *(Pukyong National University)*; Chung, Wan-Young\* *(Pukyong National University)*

**16:20-16:22**                                    ThDT5-02.6
**Surface Charge Dependence of DNA Translocation through Polymer based In-Plane Nanopore**
Jia, Zheng *(Louisiana State Univ.)*; Choi, Junseo *(Louisiana State Univ.)*; Park, Sunggook\* *(Louisiana State Univ.)*

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**ThDT5-03:  16:10-17:10**                          Lee Room
**Chemo/Bio-Sensing – Biological Sensors and Systems** (Poster Session)

**16:10-16:12**                                    ThDT5-03.1
**Effect of Ph on Successive Ionic Layer Absorption-Reaction Synthesis for Surface Enhanced Raman Scattering-Functionalized Paper Strip**
Kim, Wansun *(Kyung Hee Univ.)*; Ahn, Yong Jin *(Kyung Hee Univ.)*; Lee, Seung Ho *(Kyung Hee Univ.)*; Park, Hun-Kuk *(Kyung Hee Univ.)*; Choi, Samjin\* *(Kyung Hee Univ.)*

**16:12-16:14**                                    ThDT5-03.2
**A Sensitive Electrochemical Prohibitin Sensor based on the Three-Dimensional Porous Gold-Foamed Electrode**
Kwon, Hee Jung *(GIST)*; Yun, Young-ran *(GIST)*; Hong, Sung A *(GIST)*; Yang, Sung\* *(Gwangju Inst of Science & Tech0 (GIST))*

**16:14-16:16**                                    ThDT5-03.3
**Development of Ph Electrode for Diagnosis of Gastroesophageal Reflux Disease**
Kim, EungBo *(Hanbat National University)*; Kim, SungIl *(Hanbat National University)*; Cho, SungHwan *(Hanbat National University)*; Joung, YeunHo\* *(Hanbat National University)*

**16:16-16:18**                                    ThDT5-03.4
**High Selective Glucose Sensor via Red Blood Cell Membrane and Its Glucose Transporter -1**
Kim, Insu *(Korea Univ.)*; Kwon, DoHyung *(Korea Univ.)*; Lee, Wonseok *(Yonsei University)*; Lee, Sang Won *(Korea University)*; Yoon, Dae Sung\* *(Korea University)*

**16:18-16:20**                                    ThDT5-03.5
**Harnessing Antibody-Modified Magnetic Nanoparticles for Competitive Assay based Detection of Bisphenol A**
Xue, Xue *(Sungkyunkwan University)*; Nundy, Srijita *(Sungkyunkwan University)*; Kwon, Oh-Hyep *(Komabiotech)*; Choe, Woo-Seok\* *(Sungkyunkwan University)*

**16:20-16:22**                                    ThDT5-03.6
**A Paper-Based Colorimetric Detection of Hydrogen Sulfide from Live Cancer Cells**
Lee, Jaemyeon *(Kyunghee Univ.)*; Lee, Young Ju *(Kyung Hee Univ.)*; Ahn, Yong Jin *(Kyung Hee Univ.)*; Choi, Samjin *(Kyung Hee Univ.)*; Lee, Gi-Ja\* *(Kyung Hee Univ.)*

**16:22-16:24**                                    ThDT5-03.7
**Machine Learning Algorithm-Based Molecular Dynamic Simulation for Understanding the Molecular Mechanism of Amyloid-Related Diseases**
Yoon, Gwonchan *(Texas Tech University)*; Lee, Myeongsang *(Korea University)*; Na, Sungsoo *(Korea University)*; Seo, Sung Eun *(Korea Research Institute of Bioscience & Biotechnology)*; Lee, Jiyeon *(KRIBB)*; Kwon, Oh Seok *(Korea Research Institute of Bioscience and Biotechnology)*; Chong, Jo Woon\* *(Texas Tech University)*

**ThDT5-04:** 16:10-17:10            Lee Room
**Chemo/Bio-Sensing – Chemical Sensors
and Systems** (Poster Session)

16:10-16:12            ThDT5-04.1
**Large-Amplitude Fast Square Wave Cyclic Voltammetry
(FSWCV) for Differentiation of Neurotransmitters**
Park, CheonHo *(Hanyang University)*; Kang, Yumin *(Hanyang
University)*; Shin, Hojin *(Hanyang University)*; Cho, Hyunwoo
*(Hanyang University)*; Jang, DongPyo\* *(Hanyang University)*;
Kim, In-Young *(Hanyang University)*

16:12-16:14            ThDT5-04.2
**An Enzyme-Based Wearable Lactate Sensor
Incorporating Complementary Organic Field
Effect Transistors for High Sensitivity**
Baek, Sanghoon\* *(Pohang University of Science and
Technology (POSTECH))*; Kwon, Jimin *(Dept. of Creative IT
Engineering, Pohang University of Science)*; Sungjune, Jung
*(Pohang University of Science & Technology)*

16:14-16:16            ThDT5-04.3
**An Electrochemical Methylated DNA Sensor with Ion
Concentration Polarization**
Hong, Sung A *(GIST)*; Yang, Sung\* *(Gwangju Institute of
Science and Technology (GIST))*

16:16-16:18            ThDT5-04.4
**Self-Powered Triboelectric Aptasensor for Label-Free
Highly Specific Thrombin Detection**
Jung, Yun Kyung\* *(Inje University)*; Park, Sung Heum *(Pukyong
National University)*

16:18-16:20            ThDT5-04.5
**Development of Biopsy Needle with Flexible Multi-Modal
Physical/Chemical Sensors towards Accurate Needle Positioning**
Park, Jaeho *(Korea Advanced Institute of Science and
Technology (KAIST))*; Jeong, Yongrok *(KAIST)*; Kim, Kyuyoung
*(Korea Advanced Institute of Science and Technology)*; Gu,
Jimin *(KAIST)*; Park, Inkyu\* *(Korea Advanced Institute of
Science and Technology (KAIST))*

16:20-16:22            ThDT5-04.6
**High-Performance Detection of CRP using Au
Nanoparticles in a "μ -Capillary ELISA"**
Cho, Hyoyoung *(ETRI)*; Kim, Wan-joong *(ETRI)*;
Park, Heekyeong *(ETRI)*; Kim, Young-jun\* *(ETRI)*

**ThDT6-01:** 16:10-17:10        Zworykin Room
**Biomaterial-Cell Interactions – Biologics** (Poster Session)

16:10-16:12            ThDT6-01.1
**Matrix Stiffening Promotes Malignancy of
Gastric Cancer Cells**
Jang, Minjeong *(KAIST)*; Cheong, Jae-Ho *(Yonsei University
College of Medicine)*; Kim, Pilnam\* *(Korea Advanced Institute of
Science and Technology)*

16:12-16:14            ThDT6-01.2
**Assessment of Invasion Characteristics of GBM Cells in
Patient-Derived ECM-Based in Vitro Tumor Model**
Koh, Ilkyoo *(KAIST)*; Cha, Junghwa *(KAIST)*; Park, Jungseong
*(Yonsei University)*; Choi, Junjeong *(Yonsei University)*; Kang,
Seok-Gu *(Yonsei University)*; Kim, Pilnam\* *(Korea Advanced
Institute of Science and Technology)*

16:14-16:16            ThDT6-01.3
**Effect of Nanopillar and Nanopit Structures on Osteogenic
Differentiation of Mesenchymal Stem Cells**
Yun, Young-Shik *(Yonsei University)*; Ji, Seungmuk *(Yonsei
Institute of Convergence Technology, Yonsei University)*; Kang,
Eun-Hye *(Dept. of Plastic & Reconstruction Surgery, College of
Medicine)*; Yun, In-Sik *(Dept. of Plastic & Reconstruction
Surgery, College of Medicine)*; Kim, Yong-Oock *(Dept. of
Plastic & Reconstruction Surgery, College of Medicine)*; Yeo,
Jong-Souk\* *(Yonsei University)*

16:16-16:18            ThDT6-01.4
**Free Thiol-Inducing Microgels to Trap Invading Cancer Cells**
Cha, Junghwa *(KAIST)*; Kim, Pilnam\* *(Korea Advanced Institute
of Science and Technology)*

**ThDT6-02:** 16:10-17:10        Zworykin Room
**Biomaterial-Cell Interactions – Engineered Vascular Tissue**
(Poster Session)

16:10-16:12            ThDT6-02.1
**Lamination-Based Assembly of Hydrogels with Integrated
Channels using Nanoparticle Adhesives**
Attalla, Rana\* *(McMaster University)*; Celine, Ling *(McMaster
University)*; Selvaganapathy, Ravi *(McMaster University)*

16:12-16:14            ThDT6-02.2
**Fabrication of Micro-Channels using Wire-Network Molding
(WNM) and Its Evaluation of Micro-Channel Guided
Vascularization in Biomimetic Hydrogels**
Jaeyeon, Lee *(College of Medicine, Korea Univ.)*; Park, Yongdoo\*
*(Korea Univ.)*; Se-Hwan, Lee *(Division of Mechanical &
Automotive Engineering, College of En)*; Young-sam, Cho
*(Division of Mechanical & Automotive Engineering, College of En)*

16:14-16:16            ThDT6-02.3
**In Vitro Study of Apoptotic Macrophages on Endothelial Cells
in Mimicking Atherosclerosis Microenvironment**
Kim, Wanho\* *(Korea Advanced Institute of Science and Tech.)*;
Son, Jegoo *(Korea Advanced Institute of Science and Tech.)*;
Jeon, Jessie *(Massachusetts Institute of Tech.)*

**ThDT6-03:** 16:10-17:10        Zworykin Room
**Biomaterial-Cell Interactions – Functional
Biomaterials** (Poster Session)

16:10-16:12            ThDT6-03.1
**A Multifunctional Bio-Ink for Invasive Neural Interfaces**
Righi, Martina\* *(Scuola Superiore Sant'Anna)*; Shin, Su
*(Harvard Medical School)*; Liu, Hua *(Zhejiang University)*;
Micera, Silvestro *(Scuola Superiore Sant'Anna)*;
Khademhosseini, Ali *(Harvard-MIT)*

**ThDT6-04:** 16:10-17:10        Zworykin Room
**Biomaterials – Chemical and Electrochemical
Sensors** (Poster Session)

16:10-16:12            ThDT6-04.1
**Analysis of Surface Potential Generated by MoS2 Field-Effect
Transistors for the Detection of Biomolecules using Kelvin
Probe Force Microscopy**
Kim, Min-Hyung *(Yonsei University, Dept. of Biomedical
Engineering)*; Lim, Jongwon *(Yonsei University)*; Choi,
Seungyeop *(Younsei University)*; Lee, Hyungbeen *(Yonsei
University)*; Lee, Sang Woo\* *(Yonsei University)*

16:12-16:14            ThDT6-04.2
**Closed-Type of Pre-Treatment Device for Point-of-Care-
Testing of Infectious Disease**
Park, Hyun-ju\* *(Sungkyunkwan University)*; Jang, Yo Chang
*(Samsung Medical Center)*; Lee, Min young *(Samsung Medical
Center)*; Lee, Kyu-Sung *(Samsung Medical Center)*

**ThDT6-05:** 16:10-17:10        Zworykin Room
**Biomaterials – DNA Sensors** (Poster Session)

16:10-16:12            ThDT6-05.1
**Surface Potential Characterization of DNA-Capped
Nanoparticles for Point Mutation Detection**
Lee, Hyungbeen *(Yonsei University)*; Park, Insoo *(Yonsei
University, Dept. of Biomedical Engineering)*; Choi, Seungyeop
*(Younsei University)*; Lim, Jongwon *(Yonsei University)*; Lee,
Wonseok *(Yonsei University)*; Yoon, Dae Sung *(Korea
University)*; Lee, Sang Woo\* *(Yonsei University)*

16:12-16:14            ThDT6-05.2
**Bioplasmonic Paper for Chromatographic Separation and
Sensitive Detection of Multiple PCR Probes**
Kim, yeaji *(Sungkyunkwan University)*; Kang, Minhee\* *(Samsung
Medical Center)*; Choi, Dongil *(Samsung Medical Center)*

**Micro- and Nano-Technology** (Poster Session)

16:10-16:12                       ThDT6-06.1
**3D-Sharpened, Microfabricated Tool for Insertion of Flexible Electrode Arrays into Brain**
Chen, Supin *(Lawrence Livermore Natl. Lab)*; Fan, Jiang Lan* *(Univ. of California, San Francisco)*; Chung, Jason E. *(Univ. of California, San Francisco)*; Joo, Hannah *(Univ. of California, San Francisco)*; Pebbles, Jeanine *(Lawrence Livermore Natl. Lab)*; Frank, Loren *(Univ. of California, San Francisco)*; Tolosa, Vanessa *(Lawrence Livermore Natl. Lab)*

16:12-16:14                       ThDT6-06.2
**Applications of Dielectrophoretic Techniques for Simultaneous Analysis from Molecule to Cell Level**
Park, Insoo *(Yonsei Univ., Dept. of Biomedical Engineering)*; Choi, Seungyeop *(Younsei Univ.)*; Lim, Jongwon *(Yonsei Univ.)*; Lee, Sang Woo* *(Yonsei Univ.)*

16:14-16:16                       ThDT6-06.3
**Controllable Fabrication of Taper-Nanopore Arrays using Anodic Aluminum Oxide (AAO)**
Park, Hyung joon *(Korea University)*; Lee, Min young *(Korea University)*; Lee, Kyu Back* *(Korea University)*

16:16-16:18                       ThDT6-06.4
**Bioimaging of Mesenchymal Stem Cells using Hyaluronic Acid Conjugated Carbon Dots**
Li, Wen-Tyng* *(Chung-Yuan Christian University)*

16:18-16:20                       ThDT6-06.5
**Temperature Cycling Effect on Amyloid Fibrillation**
Lee, Wonseok *(Yonsei University)*; Lee, Hyungbeen *(Yonsei University)*; Lee, Sang Won *(Korea University)*; Choi, Yeseong *(Korea Univ.)*; Kim, Insu *(Korea Univ.)*; Lee, Gyudo *(Korea University)*; Yoon, Dae Sung* *(Korea University)*

16:20-16:22                       ThDT6-06.6
**A Portable Fluorescence Cell Counter for Evaluating Somatic Cells in Dairy Cows**
Lee, Yu Jin *(Kyung Hee Univ.)*; Kim, Byeongyeon* *(Kyung Hee Univ.)*; Park, Jong Gwan *(Kyunghee Univ.)*; You, Dongwon *(Kyunghee Univ.)*; Choi, Sung Young *(Kyung Hee Univ.)*

ThDT6-07: 16:10-17:10                     Zworykin Room
**Nano-Bio Technology Design** (Poster Session)

16:10-16:12                       ThDT6-07.1
**Non-Epigenetic Approach for Modulation of Cell Activity by Mimicking Cell-Substrate Interaction**
Park, Jae Seong *(Kyung Hee University)*; Lee, EunAh* *(Kyung Hee University)*; Choi, Da Heui *(Chung-Ang University)*; Hong, Jinkee *(Chung-Ang University)*; Oh, Tong In *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*; Park, Jong Kuk *(Korea Institute of Radiological and Medical Sciences)*

16:12-16:14                       ThDT6-07.2
**Multi-Layer Coating of Mesenchymal Stem Cells using Hyaluronic Acid and Collagen**
Lee, EunAh* *(Kyung Hee Univ.)*; Jang, Seo Young *(Kyung Hee Univ.)*; Park, Jae Seong *(Kyung Hee Univ.)*; Choi, Da Heui *(Chung-Ang Univ.)*; Hong, Jinkee *(Chung-Ang Univ.)*; Oh, Tong In *(Kyunghee Univ.)*; Woo, Eung Je *(Kyung Hee Univ.)*

ThDT6-08: 16:10-17:10                     Zworykin Room
**Biomaterial-Cell Interactions – Stimuli-Sensitive Biomaterials** (Poster Session)

16:10-16:12                       ThDT6-08.1
**Electropolymerized Polydopamine Thin Film Coating Loaded with Bortezomib Adjunct to Hyperthermia Therapy for Therapeutic Nitinol Stent Application**
Aguilar, Ludwig Erik* *(Chonbuk National Univ.)*; Kim, Minjeong *(Chonbuk National Univ.)*; Kim, Ju Yeon *(Chonbuk National Univ.)*; Park, Chan Hee *(Chonbuk National Univ.)*; Kim, Cheol Sang *(Chonbuk National Univ.)*

ThDT7-01: 16:10-17:10                      Herrick Room
**Brain-Computer/Machine Interface** (Poster Session)

16:10-16:12                       ThDT7-01.1
**Compare of Lower Limb Movement Recognition Method by EEG and Kinematics**
Jiang, Shenglong* *(Tianjin University)*; Yi, Weibo *(Tianjin University)*; Dong, Kaixian *(Tianjin University)*; He, Feng *(Tianjin University)*; Zhou, Peng *(Tianjin University)*; Qi, Hongzhi *(Tianjin University)*; Ming, Dong *(Tianjin University)*

16:12-16:14                       ThDT7-01.2
**Deep Recurrent Convolutional Network for Classifying Motor Imagery based Brain-Computer Interface**
Kim, Hyun Seok *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

16:14-16:16                       ThDT7-01.3
**Effects of Soft Drink on Brain Computer Interface**
Meng, Jianjun* *(Univ. of Minnesota)*; Mundahl, John *(Univ. of Minnesota - Dept. of Biomedical Engineering)*; He, Jeffrey *(Mounds View High School)*; He, Bin *(Univ. of Minnesota)*

16:16-16:18                       ThDT7-01.4
**Task Complexity Impact on Brain-Computer Interface Performance**
Maaroofmashat, Mohammadebrahim *(Shanghai Jiao Tong University, China)*; Zhang, Dingguo* *(Shanghai Jiao Tong University)*

16:18-16:20                       ThDT7-01.5
**Novel System Architecture for Low Complex DWT based Eye Blink Identification for Controlling IoT Environments**
Bandaru, Jagadish* *(Indian Institute of Tech. Hyderabad)*; M. P. R., Sai Kiran *(Indian Institute of Tech. Hyderabad)*; P, Rajalakshmi *(Indian Institute of Tech. Hyderabad)*; Ramkrishna, Bharath *(Indian institute of Tech. Hyderabad)*

16:20-16:22                       ThDT7-01.6
**Classification Performance in Accuracy and Delay for Real-Time fNIRS-Based BCI System**
Trakoolwilaiwan, Thanawin *(Daegu Gyeongbuk Institute of Science and Technology)*; Kim, Kyungsoo *(Daegu Gyeongbuk Institute of Science and Technology)*; Choi, Ji-Woong* *(Daegu Gyeongbuk Institute of Science and Technology)*

16:22-16:24                       ThDT7-01.7
**Three-Class Motor Imagery EEG Classification for ALS Patients**
Huang, Shiuan *(National Taipei University of Technology)*; Huang, Yi-De *(National Taipei University of Technology)*; Huang, Hao-Chung *(National Taipei University of Technology)*; Liu, Yi-Hung* *(National Taipei University of Technology)*

16:24-16:26                       ThDT7-01.8
**Flickering Action Video Improves Accuracy of Brain Computer Interface (BCI)**
Lim, Hyunmi *(Keimyung Univ.)*; Ku, Jeonghun* *(Keimyung Univ.)*

16:26-16:28                       ThDT7-01.9
**EEG-Based Brain-Computer Interface for Real-Time Binary Communication of Patients in Completely Locked-In State**
Han, Chang-Hee *(Hanyang University)*; Kim, Yong-Wook *(Hanyang University)*; Kim, Do Yeon *(Hanyang University)*; Im, Chang-Hwan* *(Hanyang University)*

16:28-16:30                       ThDT7-01.10
**Classification of Selective Attention to Spatially Separated Auditory Stimuli using Near-Infrared Spectroscopy (NIRS)**
Min, Jun-Hong *(Chonnam National Univ.)*; Han, Chang-Hee *(Hanyang Univ.)*; Shim, Miseon *(Hanyang Univ.)*; Kim, Yong-Wook *(Hanyang Univ.)*; Im, Chang-Hwan *(Hanyang Univ.)*; Kim, Do-Won* *(Chonnam National Univ.)*

**ThDT7-02:** 16:10-17:10      Herrick Room
**Neural Stimulation – Deep Brain** (Poster Session)

16:10-16:12      ThDT7-02.1
**Optimizing of Medial Forebrain Bundle Stimulation Parameters for Operant Conditioning in Rats**
Kong, Chanho *(Yonsei Univ.)*; Shin, Jaewoo *(Yonsei Univ.)*; Koh, Chin Su *(Yonsei Univ.)*; Yoon, Min-Sik *(Yonsei Univ.)*; Lee, Jihyeon *(Yonsei Univ.)*; Lee, Yena *(Ehwa Univ.)*; Cho, Yoon Kyung *(Ehwa Univ.)*; Kim, Soonyoung *(Ewha Womans Univ.)*; Jung, Hyun Ho *(Yonsei Univ.)*; Jun, Sang Beom *(Ewha Womans Univ.)*; Chang, Won Seok *(Yonsei Univ.)*; Chang, Jin Woo* *(Yonsei Univ.)*

16:12-16:14      ThDT7-02.2
**Towards Responsive Deep Brain Stimulation for Treatment of Medically Refractory Freezing of Gait in Parkinson's Disease**
Molina, Rene *(University of Florida)*; Opri, Enrico *(University of Florida)*; Gunduz, Aysegul* *(University of Florida)*

16:14-16:16      ThDT7-02.3
**Prolonged High Frequency Stimulation of Afferent Axons Can Suppress Epileptiform Spikes in the Hippocampus**
Wang, Zhaoxiang *(Zhejiang University)*; Feng, Zhouyan* *(Zhejiang University)*; Zhou, Wenjie *(Zhejiang University)*; Ma, Weijian *(Zhejiang University)*

16:16-16:18      ThDT7-02.4
**Temporally-Varying Stimulation Paradigms Generate Stable Neuronal Responses**
Cai, Ziyan *(College of Biomedical Engineering and Instrument Science, Zhejia)*; Feng, Zhouyan* *(Zhejiang University)*; Guo, Zheshan *(Zhejiang University)*; Qiu, Chen *(Zhejiang University)*

16:18-16:20      ThDT7-02.5
**Thalamic DBS Parameter-Specific Modulation of M1 Neurons**
Bello, Edward* *(University of Minnesota)*; Agnesi, Filippo *(Mayo Clinic)*; Xiao, YiZi *(University of Minnesota)*; Johnson, Matthew *(University of Minnesota)*

16:20-16:22      ThDT7-02.6
**Electrical Stimulation on Amygdala for Animal Locomotion Control via Fear Modulation**
Lee, Youjin *(Ewha Womans Univ.)*; Lee, Jee Won *(Ewha Womans Univ.)*; Cho, Yoon Kyung *(Ehwa Univ.)*; Kim, Soonyoung *(Ewha Womans Univ.)*; Lee, Yena *(Ehwa Univ.)*; Hwang, Seo Young *(Ewha Womans Univ.)*; Yoo, Hyun Ji *(Ewha Womans Univ.)*; Jeong, Hee Soo *(Ewha Womans Univ.)*; Kong, Chanho *(Yonsei Univ.)*; Shin, Jaewoo *(Yonsei Univ.)*; Koh, Chin Su *(Yonsei Univ.)*; Jung, Hyun Ho *(Yonsei Univ.)*; Chang, Jin Woo *(Yonsei Univ.)*; Jun, Sang Beom* *(Ewha Womans Univ.)*

16:22-16:24      ThDT7-02.7
**High-Frequency Caudate Stimulation Biases Decision-Making in Multi-Armed Bandit Task**
Santacruz, Samantha R.* *(University of California, Berkeley)*; Carmena, Jose M. *(University of California, Berkeley)*

16:24-16:26      ThDT7-02.8
**Low-Intensity Focused Ultrasound (LIFU) for Post-Stroke Motor Rehabilitation with Focal Ischemic Mice Model**
Baek, Hongchae *(Korea Institute of Science and Tech.)*; Kim, Min-Ju *(Korea Institute of Science and Tech.)*; Pahk, Ki Joo *(Center for Bionics, Biomedical Research Institute, Korea Institu)*; Kim, Hyungmin* *(Korea Institute of Science and Tech.)*

16:26-16:28      ThDT7-02.9
**Enhanced Motor Cortex Activity after Behavior Training**
Lee, Jee Won *(Ewha Womans University)*; Cho, Yoon Kyung *(Ehwa University)*; Lee, Youjin *(Ewha Womans University)*; Kim, Soonyoung *(Ewha Womans University)*; Jeong, Hee Soo *(Ewha Womans University)*; Kong, Chanho *(Yonsei University)*; Shin, Jaewoo *(Yonsei University)*; Koh, Chin Su *(Yonsei University)*; Jung, Hyun Ho *(Yonsei University)*; Chang, Jin Woo *(Yonsei University)*; Jun, Sang Beom* *(Ewha Womans University)*

16:28-16:30      ThDT7-02.10
**Non-Training based Rat Movement Control using Electrical Stimulation**
Koh, Chin Su *(Yonsei University)*; Park, Haeyong *(Hallym University)*; Yoon, Min-Sik *(Yonsei University)*; Shin, Jaewoo *(Yonsei University)*; Kong, Chanho *(Yonsei University)*; Ahn, Seung-Hee *(Seoul National University)*; Chang, Won Seok *(Yonsei University)*; Jung, Hyun Ho *(Yonsei University)*; Shin, Hyung-Cheul *(Hallym University)*; Kim, Sung June *(Seoul National University)*; Chang, Jin Woo* *(Yonsei University)*

16:30-16:32      ThDT7-02.11
**Rat Behavioral Control with Liquid Crystal Polymer based Electrodes in 3D-Maze**
Yoon, Min-Sik *(Yonsei Univ.)*; Ahn, Seung-Hee *(Seoul Natl. Univ.)*; Koh, Chin Su *(Yonsei Univ.)*; Shin, Jaewoo *(Yonsei Univ.)*; Kong, Chanho *(Yonsei Univ.)*; Lee, Jihyeon *(Yonsei Univ.)*; Shin, Soowon *(Seoul Natl. Univ.)*; Yun, Seunghyeon *(Seoul Natl. Univ.)*; Kim, Chaebin *(Seoul Natl. Univ.)*; Chang, Won Seok *(Yonsei Univ.)*; Jung, Hyun Ho *(Yonsei Univ.)*; Kim, Sung June *(Seoul Natl. Univ.)*; Chang, Jin Woo* *(Yonsei Univ.)*

**ThDT8-01:**      Schwan Room
**Human Performance III** (Poster Session)

16:10-16:12      ThDT8-01.1
**Using Cognitive Fit Theory to Evaluate Patient Understanding of Medical Images**
Gichoya, Judy* *(Indiana University)*; Alarifi, Mohammad *(IUPUI)*; Bhaduri, Ria *(Indiana University Purdue University Indianapolis)*; Tahir, Bilal *(Indiana University)*; Purkayastha, Saptarshi *(Indiana University Purdue University Indianapolis)*

16:12-16:14      ThDT8-01.2
**Computing the Variations in the Self-Similar Properties of the Various Gait Intervals in Parkinson Disease Patients**
Manjeri Keloth, Sana *(RMIT)*; Poosapadi Arjunan, Sridhar* *(RMIT University)*; Kant Kumar, Dinesh *(RMIT University)*

16:14-16:16      ThDT8-01.3
**CNN based Approach for Activity Recognition using a Wrist-Worn Accelerometer**
Panwar, Madhuri *(IIT Hyderabad)*; Sristi, Ram Dyuthi *(Indian Institute of Technology Hyderabad)*; Konkimalla, Chandra Prakash *(Indian Institute of Technology Hyderabad)*; Biswas, Dwaipayan *(Univ. of Southampton)*; Acharyya, Amit* *(Indian Institute of Technology Hyderabad)*; Maharatna, Koushik *(Univ. of Southampton)*; Gautam, Arvind Kumar *(IIT Hyderabad)*; Naik, Ganesh R *(Univ. of Technology Sydney)*

16:16-16:18      ThDT8-01.4
**The Timing of Theta Phase Synchronization Accords with Vigilant Attention**
Wei, Jinwen *(Tianjin University)*; Ke, Yufeng *(Tianjin University)*; Sun, Chang *(Tianjin University)*; An, Xingwei *(Tianjin University)*; QI, Hongzhi *(Tianjin University)*; Ming, Dong *(Tianjin University)*; Zhou, Peng* *(Tianjin University)*

16:18-16:20      ThDT8-01.5
**Role of Multisensory Stimuli in Vigilance Enhancement – A Single Trial Event Related Potential Study**
Abbasi, Nida Itrat* *(National Univ. of Singapore)*; Bodala, Indu Prasad *(National Univ. of Singapore)*; Bezerianos, Anastasios *(National Univ. of Singapore)*; Sun, Yu *(National Univ. of Singapore)*; Al-Nashash, Hasan *(American Univ. of Sharjah)*; Thakor, Nitish *(Johns Hopkins Univ.)*

16:20-16:22      ThDT8-01.6
**Automatic Visual Impairment Detection System for Age-Related Eye Diseases through Gaze Analysis**
Yow, Ai Ping* *(Institute for Infocomm Research)*; Wong, Damon *(Institute for Infocomm Research)*; Liu, Huiying *(Institute for Infocomm Research)*; Zhu, Hongyuan *(Tan Tock Seng Hospital)*; Ong, Jing Wen Ivy *(Tan Tock Seng Hospital)*; Laude, Augustinus *(Tan Tock Seng Hospital)*; Lim, Tock Han *(Tan Tock Seng Hospital)*

**16:22-16:24**                                   ThDT8-01.7
**Towards Understanding Addiction Factors of Mobile Devices: An Eye Tracking Study on Effect of Screen Size**
Wibirama, Sunu* *(Universitas Gadjah Mada)*; Adi Nugroho, Hanung *(Universitas Gadjah Mada)*

**16:24-16:26**                                   ThDT8-01.8
**Effects of Galvanic Skin Response Feedback on User Experience in Gaze-Controlled Gaming: A Pilot Study**
Larradet, Fanny Isabelle* *(Istituto Italiano di tecnologia)*; Barresi, Giacinto *(Istituto Italiano di Tecnologia)*; Mattos, Leonardo *(IIT - Istituto Italiano di Tecnologia)*

**16:26-16:28**                                   ThDT8-01.9
**Stimulation Time Determination for Lower Limb FES by using Gait Event and a "Delay"**
Bao, Xueliang *(Southeast Southeast University, State Key Lab of Bioelectronics)*; Bi, Zhengyang *(Southeast Southeast University, State Key Lab of Bioelectronics)*; Lü, Xiaoying *(Southeast University)*; Wang, Zhigong* *(Southeast University)*

**16:28-16:30**                                   ThDT8-01.10
**Characterization of the Pierce Two-Node Model under Exercise Load by Parameter Optimization Toward Construction of a Modified Thermal Model for Persons with Spinal Cord Injury**
Takizawa, Kenta* *(Tokyo Institute of Tech., Natl. Rehab. Center)*; Suzurikawa, Jun *(Research Institute of Natl. Rehab. Center for Persons)*; Higuchi, Yukiharu *(Natl. Rehab. Center for Persons with Disabilities)*; Huang, Ming *(Nara Institute of Science and Tech.)*; Tamura, Toshiyo *(Waseda Univ.)*; Kurabayashi, Daisuke *(Tokyo Institute of Tech.)*; Inoue, Takenobu *(Research Institute of Natl. Rehab. Center for Persons)*; Ogata, Toru *(Natl. Rehab. Center for Persons with Disabilities)*; Takashima, Atsushi *(Natl. Rehab. Center for Persons with Disabilities)*

**16:30-16:32**                                   ThDT8-01.11
**Evaluation of Different Cochlear Implants in Unilateral Hearing Patients during Word Listening Tasks: A Brain Connectivity Study**
Maglione, Anton Giulio *(Univ. of Rome Sapienza)*; Cartocci, Giulia *(Univ. of Rome Sapienza)*; Modica, Enrica *(Univ. of Rome Sapienza)*; Rossi, Dario *(Univ. of Rome Sapienza)*; Colosimo, Alfredo *(Univ. of Rome "Sapienza")*; Di Flumeri, Gianluca* *(Univ. of Rome Sapienza)*; Malerba, Paolo *(Cochlear)*; Babiloni, Fabio *(Univ. of Rome)*

**16:32-16:34**                                   ThDT8-01.12
**Estimation of Joint Position Error**
Agostini, Valentina* *(Politecnico di Torino)*; Rosati, Samanta *(Politecnico di Torino)*; Balestra, Gabriella *(Politecnico di Torino)*; Trucco, Marco *(Presidio San Camillo, Torino)*; Visconti, Lorenzo *(Studi Fisioterapici di Montagna, Aosta)*; Knaflitz, Marco *(Politecnico di Torino)*

**16:34-16:36**                                   ThDT8-01.13
**Measuring Vigilance Decrement using Computer Vision Assisted Eye Tracking in Dynamic Naturalistic Environments**
Bodala, Indu Prasad* *(National Univ. of Singapore)*; Abbasi, Nida Itrat *(National Univ. of Singapore)*; Sun, Yu *(National Univ. of Singapore)*; Bezerianos, Anastasios *(National Univ. of Singapore)*; Al-Nashash, Hasan *(American Univ. of Sharjah)*; Thakor, Nitish *(Johns Hopkins Univ.)*

**16:36-16:38**                                   ThDT8-01.14
**Correlation of Reaction Time and EEG Log Bandpower from Dry Frontal Electrodes in a Passive Fatigue Driving Simulation Experiment**
Foong, Ruyi* *(Agency for Science, Technology and Research (A*Star), Nanyang Te)*; Ang, Kai Keng *(Institute for Infocomm Research)*; Quek, Chai *(Nanyang Technological University)*

**16:38-16:40**                                   ThDT8-01.15
**Differences in Lower Limb Muscle Activation Patterns during Sit to Stand Task for Different Heel Heights**
Naik, Ganesh R* *(Univ. of Tech. Sydney)*; Pratihast, Manisha *(Univ. of Tech. Sydney)*; Al-Ani, Ahmed *(Univ. of Tech., Sydney)*; Chai, Rifai *(Univ. of Tech., Sydney)*; Nguyen, Hung T. *(Univ. of Tech., Sydney)*; Acharyya, Amit *(Indian Inst. of Tech. Hyderabad)*

**16:40-16:42**                                   ThDT8-01.16
**Learning Classifier to Evaluate Movement Quality in Unassisted Pick-and-Place Exercises for Post-Stroke Patients: A Preliminary Study**
Jung, Hee-Tae* *(Daegu Univ.)*; Kim, Hwan *(Daegu Univ.)*; Oh Mi Young, Oh Mi Young *(Heeyeon Hospital)*; Ryu, Taekyeong *(Heeyeon Hospital)*; Kim, Yangsoo *(Heeyeon Hospital)*

**16:42-16:44**                                   ThDT8-01.17
**EEG-Based Emergency Braking Intention Prediction for Brain-Controlled Driving Considering Electrode Falling-Off**
Wang, Huikang *(Beijing Institute of Tech.)*; Bi, Luzheng* *(Beijing Institute of Tech.)*; Teng, Teng *(Beijing Institute of Tech.)*

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**ThDT8-02: 16:10-17:10**                          Schwan Room
**Neuromuscular Systems II** (Poster Session)

**16:10-16:12**                                   ThDT8-02.1
**The Role of Nonmotor Brain Regions during Human Motor Control**
Johnson, Jacob J. *(Indian Institute of Tech. Guwahati)*; Breault, Macauley S.* *(Johns Hopkins Univ.)*; Sacré, Pierre *(Johns Hopkins Univ.)*; Kerr, Matthew *(Johns Hopkins Univ.)*; Johnson, Matthew *(Cleveland Clinic)*; Bulacio, Juan *(Cleveland Clinic)*; Gonzalez-Martinez, Jorge *(Cleveland Clinic)*; Sarma, Sridevi V. *(Johns Hopkins Univ.)*; Gale, John *(Cleveland Clinic)*

**16:12-16:14**                                   ThDT8-02.2
**Influence of Pre-Processing in the Extraction of Muscle Synergies during Human Locomotion**
Rimini, Daniele *(Politecnico di Torino)*; Agostini, Valentina *(Politecnico di Torino)*; Rosati, Samanta *(Politecnico di Torino)*; Castagneri, Cristina *(Politecnico di Torino)*; Balestra, Gabriella *(Politecnico di Torino)*; Knaflitz, Marco* *(Politecnico di Torino)*

**16:14-16:16**                                   ThDT8-02.3
**Feature Selection for Bayes Classification of Prolonged Fatigue on Rectus Femoris Muscle**
Jamaluddin, Nurul Fauzani *(Universiti Putra Malaysia)*; Siti Anom, Ahmad* *(Universiti Putra Malaysia)*

**16:16-16:18**                                   ThDT8-02.4
**Importance of Muscle Selection for EMG Signal Analysis during Upper Limb Rehabilitation of Stroke Patients**
Costa, Álvaro* *(Brain Science Institute (BSI) BSI-Toyota Collaboration Center (B)*; Itkonen, Matti *(Brain Science Institute (BSI), RIKEN)*; Yamasaki, Hiroshi *(Brain Science Institute (BSI) BSI-Toyota Collaboration Center (B)*; Alnajjar, Fady SK *(BTCC, RIKEN)*; Shimoda, Shingo *(RIKEN)*

**16:18-16:20**                                   ThDT8-02.5
**Variance Distribution Analysis of Surface EMG Signals based on Marginal Maximum Likelihood Estimation**
Furui, Akira* *(Hiroshima University)*; Hayashi, Hideaki *(Hiroshima University)*; Kurita, Yuichi *(Hiroshima University)*; Tsuji, Toshio *(Hiroshima University)*

**16:20-16:22**                                   ThDT8-02.6
**Influence of Trans-Spinal Magnetic Stimulation in Electrophysiological Recordings for Closed-Loop Rehabilitative Systems**
Insausti-Delgado, Ainhoa* *(Eberhard Karls University of Tübingen)*; López-Larraz, Eduardo *(University of Tübingen)*; Bibián, Carlos *(University Tübingen)*; Nishimura, Yukio *(NIPS)*; Birbaumer, Niels *(Eberhard-Karls-University)*; Ramos-Murguialday, Ander *(Eberhard Karls University of Tubingen/TECNALIA)*

**16:22-16:24**                                   ThDT8-02.7
**Evaluation of Postural Instability in Stroke Patient during Quiet Standing**
Wang, Wei *(School of Control Science and Engineering, Shandong University)*; Li, Ke* *(Shandong University)*; Wei, Na *(Dept. of Geriatrics, Qilu Hospital, Shandong University)*; Yin, Cuiping *(Dept. of Physical Medicine and Rehabilitation, Qilu Hospital)*; Yue, Shouwei *(Dept. of Physical Medicine and Rehabilitation, Qilu Hospital)*

16:24-16:26      ThDT8-02.8

**Influence of Light Finger Touch on Postural Stability during Upright Stance with Cold-Induced Plantar Hypoesthesia**
Oshita, Kazushige* *(Kyushu Kyoritsu University)*;
Yano, Sumio *(Kobe University)*

16:26-16:28      ThDT8-02.9

**Entropy of Surface EMG Reflects Object Weight in Grasp-and-Lift Task**
Li, Yuqi* *(City University of Hong Kong)*; Jelfs, Beth *(RMIT University)*; Chan, Rosa H. M. *(City University of Hong Kong)*

16:28-16:30      ThDT8-02.10

**Muscle Synergy Analysis in Dart Throwing**
Tran, Nguyen Bao* *(Tokyo Univ. of Agriculture and Tech.)*;
Yano, Shiro *(Tokyo Univ. of Agriculture and Tech.)*; Kondo, Toshiyuki *(Tokyo Univ. of Agriculture and Tech.)*

16:30-16:32      ThDT8-02.11

**Estimation of Joint Angle based on Surface Electromyogram Signals Recorded at Different Load Levels**
Azab, Ahmed* *(Univ. of Sheffield)*; Arvaneh, Mahnaz *(Univ. of Sheffield)*; Mihaylova, Lyudmila *(Univ. of Sheffield)*

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**ThDT9-01:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging III** (Poster Session)

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16:10-16:12      ThDT9-01.1

**Spatiotemporal Properties of Magnetic Fields Induced by Auditory Speech Sound Imagery and Perception**
Uzawa, Shihomi* *(Kobe Univ.)*; Takiguchi, Tetsuya *(Kobe Univ.)*; Ariki, Yasuo *(Kobe Univ.)*; Nakagawa, Seiji *(Chiba Univ.)*

16:12-16:14      ThDT9-01.2

**Prefrontal Cortical Activation while Viewing Urban and Garden Scenes: A Pilot fNIRS Study**
Yu, Juanhong* *(Institute for Infocomm Research, Agency for Science, Technology and)*; Ang, Kai Keng *(Institute for Infocomm Research)*; Ho, Cyrus SH *(National University Hospital)*; Sia, Angelia *(National Parks of Singapore)*; Ho, Roger *(National University Hospital)*

16:14-16:16      ThDT9-01.3

**Physiological Fluctuations Show Frequency-Specific Networks in fNIRS Signals during Resting State**
Fernandez Rojas, Raul* *(University of Canberra)*; Huang, Xu *(University of Canberra)*; Hernandez-Juarez, Jesus *(UABJO)*; Ou, Keng-Liang *(Taipei Medical University)*

16:16-16:18      ThDT9-01.4

**Analysis of Cognitive Fatigue using EEG Parameters**
Sengupta, Anwesha* *(IIT KHARAGPUR)*; Tiwari, Abhishek *(IIT KHARAGPUR)*; Routray, Aurobinda *(Indian Institute of Technology, Kharagpur, India)*

16:18-16:20      ThDT9-01.5

**Cortical Activity Changes as Related to Oral Irritation – An fNIRS Study**
Zeng, Tianjiao *(Rutgers University)*; Peru, Deborah *(Colgate Palmolive)*; Maloney, Venda Porter *(Colgate Palmolive)*; Najafizadeh, Laleh* *(Rutgers University)*

16:20-16:22      ThDT9-01.6

**Correlated Alpha Activity with the Facial Expression Processing Network in a Simultaneous EEG-fMRI Experiment**
Simões, Marco *(Univ. of Coimbra)*; Direito, Bruno *(FCTUC, Univ. of Coimbra)*; João, Lima *(IBILI, Univ. of Coimbra)*; Castelhano, João *(ICNAS, Univ. of Coimbra)*; Ferreira, Carlos *(ICNAS, Univ. of Coimbra)*; Couceiro, Ricardo* *(Univ. of Coimbra)*; de Carvalho, Paulo *(Univ. of Coimbra)*; Castelo-Branco, Miguel *(Univ. of Coimbra)*

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**ThDT9-02:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging – Connectivity and Information Flow** (Poster Session)

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16:10-16:12      ThDT9-02.1

**Functional Connectomes using Kalman-Filter Beamforming and Phase Locking Value**
Nguyen, Thanh Duc* *(Gwangju Institute of Science and Tech.)*;
Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

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**ThDT9-03:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging – EEG** (Poster Session)

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16:10-16:12      ThDT9-03.1

**Time-Frequency Analysis of the Electroencephalogram Related to the Skin Conductance Response Evoked by Emotional Events**
Seo, Pukyeong *(Yonsei Univ.)*; Choi, Jeong Woo *(Yonsei Univ.)*; Kim, Hyun *(Yonsei)*; Yeo, Donghoon *(Yonsei Univ.)*; Her, Seong Jin *(Yonsei Univ.)*; Kim, Kyung Hwan* *(Yonsei Univ.)*

16:12-16:14      ThDT9-03.2

**BCI based Word Speller using SSVEP and Electro-Ocular Gram Signals**
Ryu, Jaehwan *(INHA University)*; Kim, Deok-Hwan* *(INHA University)*; Lee, Miran *(Korea Institute of Science and Tech.)*; Youn, Inchan *(Korea Institute of Science and Tech.)*

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**ThDT9-04:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging – Evoked potentials** (Poster Session)

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16:10-16:12      ThDT9-04.1

**A Basic Study on Emotion-Related Brain Potentials for Quantitative Emotion Analysis**
Hirakochi, Ren* *(Tokyo City Univ.)*; Ishii, Takayuki *(Tokyo City Univ.)*; Matsumoto, Kana *(Tokyo City Univ.)*; Shimatani, Yuichi *(Tokyo City Univ.)*; Kyoso, Masaki *(Tokyo City Univ.)*

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**ThDT9-05:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging – Mapping** (Poster Session)

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16:10-16:12      ThDT9-05.1

**Emotion Associated Brain Functional Network Analysis in Human EEG using Graph Measures**
Gonuguntla, Venkateswarlu *(Kyungpook National Univ.)*; Shafiq, Ghufran *(Kyungpook National Univ.)*; Mallipeddi, Rammohan *(Kyungpook National Univ.)*; Veluvolu, Kalyana C.* *(Kyungpook National Univ.)*

16:12-16:14      ThDT9-05.2

**A Somatosensory Brain Map Generation System based on Stereotactic Device and tFUS Brain Stimulation**
Kim, Kihyun *(Samsung Electronics)*; Jang, Gyeongcheol *(INHA Univ.)*; Kim, Taeksoo *(Samsung Electronics)*; Lee, Eunjung *(Samsung Electronics)*; Jeon, Seung Ryong* *(Yonsei Univ.)*

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**ThDT9-06:** 16:10-17:10      Plonsey Room
**Brain Functional Imaging – MEG** (Poster Session)

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16:10-16:12      ThDT9-06.1

**Ostensible Alpha-Band Correlation with Memory Performance Shown during Memory Encoding: An MEG Study**
Yokosawa, Koichi* *(Hokkaido University)*; Chitose, Ryota *(Hokkaido University)*; Kimura, Keisuke *(Hokkaido University)*

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**ThDT9-07:** 16:10-17:10      Plonsey Room
**Brain Physiology and Modeling – Cognition, Memory, Perception** (Poster Session)

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16:10-16:12      ThDT9-07.1

**in Vivo Single Fiber Recording Method for the Temporal Analysis of Texture Stimulation-Evoked Spike Trains from Rat Skin**
Park, Jinoh *(Hanyang University)*; Cho, Kyeong Won *(Hanyang Univ.)*; Choi, Jeongbong *(Hanyang Univ.)*; Park, Kyong Hwan *(Hanyang Univ.)*; Yook, Sunhyun *(Hanyang Univ.)*; Kim, In-Young *(Hanyang Univ.)*; Jung, Sung Jun *(Hanyang Univ.)*; Jang, DongPyo* *(Hanyang Univ.)*

**ThDT9-08:** 16:10-17:10 — Plonsey Room
**Brain Physiology and Modeling – Neural Dynamics and Computation** (Poster Session)

16:10-16:12 — ThDT9-08.1
**Multiphysics Simulation of Cyclic Voltammetry Neurotransmitter Sensing under Mechanical Motion**
Han, Seonhye *(Norfolk State University)*; Polanco, Michael *(Old Dominion University)*; Bawab, Sebastian *(Old Dominion University)*; Yoon, Hargsoon* *(Norfolk State University)*

16:12-16:14 — ThDT9-08.2
**Neurophysiological Correlates of Emotional Arousal in Healthy Adults**
Kim, Hyun *(Yonsei Univ.)*; Choi, Jeong Woo *(Yonsei Univ.)*; Cha, Kwang Su *(Yonsei Univ.)*; Yeo, Donghoon *(Yonsei Univ.)*; Seo, Pukyeong *(Yonsei Univ.)*; Her, Seong Jin *(Yonsei Univ.)*; Kim, Kyung Hwan* *(Yonsei Univ.)*

**ThDT9-09:** 16:10-17:10 — Plonsey Room
**Brain Physiology and Modeling – Sensory-Motor** (Poster Session)

16:10-16:12 — ThDT9-09.1
**Amplitude Variation of Somatosensory Evoked Potentials Due to Vibration of Perception Subthreshold Applied to Achilles Tendon in Elderly**
Kim, Dong-Wook *(Chonbuk National Univ.)*; Kim, Huigyun* *(Chonbuk National Univ.)*; Kwak, Kiyoung *(Chonbuk National Univ.)*; Kim, Jaeseong *(Chonbuk National Univ.)*

**ThDT9-10:** 16:10-17:10 — Plonsey Room
**Neural Signal Processing** (Poster Session)

16:10-16:12 — ThDT9-10.1
**Denoising of Local Field Potentials from Deep Leads Affected by Pneumatic Noise Artifact**
Opri, Enrico *(University of Florida)*; Cernera, Stephanie *(University of Florida)*; Molina, Rene *(University of Florida)*; Gunduz, Aysegul* *(University of Florida)*

16:12-16:14 — ThDT9-10.2
**The Activation of Posterior Cingulate Cortex in Response to Emotional Pictures: An Electroencephalogram Current Source Density Analysis**
Yeo, Donghoon *(Yonsei Univ.)*; Choi, Jeong Woo *(Yonsei Univ.)*; Cha, Kwang Su *(Yonsei Univ.)*; Kim, Hyun *(Yonsei Univ.)*; Seo, Pukyeong *(Yonsei Univ.)*; Her, Seong Jin *(Yonsei Univ.)*; Kim, Kyung Hwan* *(Yonsei Univ.)*

16:14-16:16 — ThDT9-10.3
**Variability Reduction in Cortical Potentials Evoked by Pitch Matched Electroacoustic Stimulation**
Heydarzadeh, Mehrdad* *(The University of Texas at Dallas)*; Tan, Chin-Tuan *(University of Texas, Dallas)*

16:16-16:18 — ThDT9-10.4
**Simultaneous Measurements of Cortical Somatosensory and Spinal Cord Evoked Potential Before and After Spinal Cord Injury in Rat**
Matsumoto, Kana* *(Tokyo City University)*; Hirakochi, Ren *(Tokyo City University)*; Ishii, Takayuki *(Tokyo City University)*; Kyoso, Masaki *(Tokyo City University)*; Shimatani, Yuichi *(Tokyo City University)*

16:18-16:20 — ThDT9-10.5
**The Automatic Massage Chairs' Effects on Sustained Attention**
Lim, Jeong-Hwan* *(Bodyfriend)*; Choi, Youra *(Bodyfreind)*; Jeon, Chuljin *(Bodyfriend)*; Cho, Soo Hyun *(Bodyfriend)*

16:20-16:22 — ThDT9-10.6
**Individual Identification based on Electroencephalogram (EEG)**
Kim, Eun-ji *(Kumoh National Institute of Technology)*; Kang, Ye Na *(Kumoh National Institute of Technology)*; Kim, Kyoungmin *(Kumoh National Institute of Technology)*; Choi, Soo-In *(Kumoh National Institute of Technology)*; Hwang, Han-Jeong* *(Kumoh National Institute of Technology)*

16:22-16:24 — ThDT9-10.7
**Comparison of Synergistic Muscle Activation Extracted from EMG Signals during the Arm Cycling in Different Intensity Levels**
Alizadeh Saravi, Leila *(Sejong University)*; Han, JiHye *(Sejong University)*; Lim, Dohyung* *(Sejong Univ.)*

16:24-16:26 — ThDT9-10.8
**A Clinical Study on the Automatic Massage Chairs using EEG Analysis**
Lim, Jeong-Hwan* *(Bodyfriend)*; Jeon, Chuljin *(Bodyfriend)*; Cho, Soo Hyun *(Bodyfriend)*

16:26-16:28 — ThDT9-10.9
**An Artificial Neural Network Model for the Evaluation of Carotid Artery Stenting Prognosis using a National-Wide Database**
Cheng, Chun An *(Taipei Medical University)*; Chiu, Hung-Wen* *(Taipei Medical University)*

**ThDT9-11:** 16:10-17:10 — Plonsey Room
**Sensory Neuroprostheses – Visual** (Poster Session)

16:10-16:12 — ThDT9-11.1
**Influence of Return Electrode Position on Voltage Transient of Electrical Stimulation in Suprachoroidal Retinal Prosthesis**
Terasawa, Yasuo* *(Nidek Co., Ltd.)*; Nakano, Yukari *(Nidek Co., Ltd.)*; Yodogawa, Satoshi *(Nidek Co., Ltd.)*; Shodo, Kenzo *(Nidek Co., Ltd.)*

16:12-16:14 — ThDT9-11.2
**Observation of Temporal Change in Retinal Degeneration of an RCS Rat using Optical Coherence Tomography (OCT)**
Nakano, Yukari* *(Nidek Co., Ltd.)*; Terasawa, Yasuo *(Nidek Co., Ltd.)*

16:14-16:16 — ThDT9-11.3
**Retinal Ganglion Cell Responses to Low-Frequency Focused Ultrasound Stimulation**
Zhao, Huixia* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Qiu, Weibao *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Qiuju, Jiang *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*

**ThDT10-01:** 16:10-17:10 — Schmitt Room
**Health Informatics – Computer-Aided Decision Making I** (Poster Session)

16:10-16:12 — ThDT10-01.1
**Combination of Static and Temporal Data Analysis to Predict Mortality and Readmission in the Intensive Care**
Venugopalan, Janani *(Georgia Institute of Technology)*; Chanani, Nikhil *(Emory Univ. School of Medicine)*; Maher, Kevin *(Kids Heart)*; Wang, May D.* *(Georgia Tech and Emory Univ.)*

16:12-16:14 — ThDT10-01.2
**Functional Hemispheric Asymmetry in Female Prefrontal Hemodynamics Corresponding to Changes in Auditory Sense during Pregnancy and Child Raising**
Kotani, Hiroko *(Tokyo Future Univ.)*; Kato, Misa *(Tokyo Future Univ.)*; Matsuno, Maka *(Tokyo Future Univ.)*; Kuramoto, Kasumi *(Tokyo Future Univ.)*; Nakagawa, Hidenori* *(Tokyo Denki Univ.)*

16:14-16:16 — ThDT10-01.3
**Queue-Based Modelling and Detection of Parameters Involved in Stroke Outcome**
Vilic, Adnan* *(Technical Univ. of Denmark)*; Petersen, Asger *(Bispebjerg Hospital)*; Wienecke, Troels *(Zealand Univ. Hospital, Roskilde)*; Kjaer, Troels W. *(Roskilde Univ. Hospital)*; Sorensen, Helge B D *(Technical Univ. of Denmark)*

16:16-16:18 — ThDT10-01.4
**Pattern Discovery and Similarity Assessment for Robust Heart Sound Segmentation**
Nunes, Diogo *(Univ. of Coimbra)*; de Carvalho, Paulo *(Univ. of Coimbra)*; Henriques, Jorge *(Univ. of Coimbra)*; Teixeira, César *(Univ. of Coimbra)*; Ruano, M. Graça* *(FCT, Univ. of Algarve & CISUC-Univ. of Coimbra)*

**16:18-16:20**  ThDT10-01.5
**The Application of Individual Virtual Nostalgic Game Design to the Evaluation of Cognitive Function**
Hou, Chun-Ju *(Southern Taiwan Univ. of Science and Tech.)*; Huang, Min-Wei *(National Cheng Kung Univ.)*; Zhou, Jia-Ying *(Asia Univ. Dept. of Psychology)*; Hsu, Pin Chen *(Southern Taiwan Univ. of Science and Tech.)*; Zeng, Jia Hong *(Southern Taiwan Univ. of Science and Tech.)*; Chen, Yen-Ting* *(Southern Taiwan Univ. of Science and Tech.)*

**16:20-16:22**  ThDT10-01.6
**Correlation of P300 ERPs with Visual Stimuli and its Application to Vigilance Detection**
Samima, Shabnam* *(Indian Institute of Technology Kharagpur)*; Sarma, Monalisa *(Indian Institute of Technology Kharagpur)*; Samanta, Debasis *(Indian Institute of Technology Kharagpur)*

**16:22-16:24**  ThDT10-01.7
**Mobile Concussion Management Application for Amateur Sports**
Fischer, Joshua* *(Stellenbosch Univ.)*; Smith, Gerard *(Stellenboch Univ.)*; Rodriquez, Rafael *(Federal Univ. of Paraná)*; Afzal, Muhammad Raheel *(Gyeongsang National Univ.)*; Van Den Heever, Dawie *(Stellenbosch Univ.)*; Viviers, Pierre *(Stellenbosch Univ.)*; Viljoen, Jeandre *(Institute of Sport and Exercise Medicine, Division of Orthopaedi)*

**ThDT10-02:  16:10-17:10**  Schmitt Room
**Health Informatics – Health Data Acquisition, Transmission, Management and Visualization I** (Poster Session)

**16:10-16:12**  ThDT10-02.1
**Efficient Implementation of Stockwell Transform for Real-Time Embedded Processing of Physiologic Signals**
Holmes, David* *(Mayo Clinic)*; Cerqueira Pinto, Samuel *(Instituto Tecnológico de Aeronáutica)*; Felton, Christopher *(Mayo Clinic)*; Smital, Lukas *(Brno Univ. of Technology, Brno, CZ)*; Leinveber, Pavel *(St. Anne's Univ. Hospital)*; Jurak, Pavel *(Inst of Scientific Instruments Academy)*; Gilbert, Barry *(Mayo Clinic College of Medicine)*; Haider, Clifton *(Mayo Clinic)*

**16:12-16:14**  ThDT10-02.2
**APEX_SCOPE: A Graphical User Interface for Visualization of Multi-Modal Data in Inter-Disciplinary Studies**
Kanbar, Lara* *(McGill University)*; Shalish, Wissam *(McGill University)*; Precup, Doina *(McGill University)*; Brown, Karen *(McGill University)*; Sant'Anna, Guilherme Mendes *(McGill University)*; Kearney, Robert Edward *(McGill University)*

**16:14-16:16**  ThDT10-02.3
**CTG Analyzer: A Graphical User Interface for Cardiotocography**
Sbrollini, Agnese *(Univ. Politecnica delle Marche)*; Agostinelli, Angela *(Polytechnic University of Marche)*; Burattini, Luca *(Univ. Politecnica delle Marche)*; Morettini, Micaela *(Univ. Politecnica delle Marche)*; Di Nardo, Francesco *(Polytechnic University of Marche)*; Fioretti, Sandro *(Univ. Politecnica delle Marche)*; Burattini, Laura* *(Univ. Politecnica delle Marche)*

**16:16-16:18**  ThDT10-02.4
**A Comparative Study of Electronic Stethoscopes for Cardiac Auscultation**
Pinto, Cristiana *(Instituto de Telecomunicações, Faculdade de Ciências da Universi)*; Pereira, Daniel *(Faculty of Medicine, University of Porto)*; Ferreira-Coimbra, João *(Internal Medicine Dept., Centro Hospitalar de São João)*; Português, João *(Serviço de Cardiologia do Hospital Senhora da Oliveira)*; Gama, Vasco *(Hospital Santos Silva)*; Coimbra, Miguel* *(Instituto de Telecomunicações / Universidade do Porto)*

**ThDT10-03:  16:10-17:10**  Schmitt Room
**Health Informatics – Information Technologies for Healthcare Delivery and Management I** (Poster Session)

**16:10-16:12**  ThDT10-03.1
**Symptom-Based Data Preprocessing for the Detection of Disease Outbreak**
Duangchaemkarn, Khanita* *(Chiang Mai Univ.)*; Boonchieng, Ekkarat *(Chiang Mai Univ.)*; Chaovatut, V. *(Chiang Mai Univ.)*; Wiwatanadate, P. *(Faculty of Medicine, Chiang Mai Univ.)*

**16:12-16:14**  ThDT10-03.2
**Predictive Modeling to Identify Scheduled Radiology Appointments Resulting in Non-Attendance in a Hospital Setting**
Mieloszyk, Rebecca* *(Philips Healthcare, University of Washington)*; Rosenbaum, Joshua *(University of Washington)*; Bhargava, Puneet *(University of Washington)*; Hall, Christopher *(Philips Healthcare, University of Washington)*

**16:14-16:16**  ThDT10-03.3
**New Tele-Diagnostic Model using Volume Sweep Imaging for Rural Areas**
Ferrer, Jose *(Pontificia Univ. Catolica del Peru)*; Castañeda, Benjamín* *(Pontificia Univ. Católica del Perú)*; Chaumont, Thomas *(Medical Innovation & Tech.)*; Garra, Gail *(Medical Imaging Ministries of the Americas)*; Garra, Katherine *(Medical Imaging Ministries of the Americas)*; Stephens, Nicole *(Medical Imaging Ministries of the Americas)*; Jacobo, Sylvia *(Medical Imaging Ministries of the Americas)*; Waks, Erin *(Medical Imaging Ministries of the Americas)*; Miele, Frank *(Medical Imaging Ministries of the Americas)*; Stewart, Pilar *(Medical Innovation & Tech.)*; Fernandez, Italo *(Medical Innovation & Tech.)*; Campos, Maria Fernanda *(Medical Innovation & Tech.)*; Trujillo, Leslie *(Medical Innovation & Tech.)*; Guerrero, Jorge *(Oncosalud)*; Garra, Brian *(Washington DC VA Medical Center and Center for Devices & Radiolo)*

**16:16-16:18**  ThDT10-03.4
**Exploratory Multivariate Analysis of Hospital Admissions Data in Conjunction with Workforce Data**
Xie, Yang* *(CSIRO (Commonwealth Scientific and Industrial Research Organisat)*; Good, Norm *(CSIRO Australian e-Health Research Centre)*; Khanna, Sankalp *(CSIRO Australian e-Health Research Centre)*; Boyle, Justin *(CSIRO)*

**16:18-16:20**  ThDT10-03.5
**Design of an Mhealth System for Maternal and Children HIV Care**
Koesoema, Allya Paramita* *(UNSW)*; Ariani, Arni *(University of New South Wales)*; Irawan, Yoke Saadia *(Institut Teknologi Bandung)*; Soegijoko, Soegijardjo *(Dept. of Electrical Engineering, Institut Teknologi Nasiona)*

**16:20-16:22**  ThDT10-03.6
**Modelling and Analysis of Four Telemedicine Italian Experiences**
Rosati, Samanta *(Politecnico di Torino)*; Zema, Maddalena *(Reply S.p.A.)*; Castagneri, Cristina *(Politecnico di Torino)*; Marchetti, Fulvio *(Healthy Reply)*; Balestra, Gabriella* *(Politecnico di Torino)*

**ThDT10-04:  16:10-17:10**  Schmitt Room
**Health Informatics – Knowledge Discovery and Management I** (Poster Session)

**16:10-16:12**  ThDT10-04.1
**Towards Objective and Reproducible Study of Patient-Doctor Interaction: Automatic Text Analysis based VR-CoDES Annotation of Consultation Transcripts**
Charlotte, Birkett *(Univ. of St Andrews)*; Arandjelovic, Ognjen* *(Univ. of St Andrews)*; Humphris, Gerald *(Univ. of St Andrews)*

**16:12-16:14**  ThDT10-04.2
**An Ordinal Classification Approach for CTG Categorization**
Georgoulas, George *(TEI of Epirus)*; Karvelis, Petros *(University of Ioannina)*; Gavrilis, Dimitris *(University of Patras)*; Stylios, Chrysostomos* *(TEI of Epirus)*; Nikolakopoulos, George *(Luleå University of Technology)*

**16:14-16:16**  ThDT10-04.3
**A Dynamic Decision Support System for Obstetricians based on Fuzzy Cognitive Maps**
Chouliara, Spyridoula *(University of Ioannina,)*; Stylios, Chrysostomos* *(Technological Educational Institute of Epirus)*; Georgopoulos, Voula *(Technological Educal Inst of Patras)*; Stefos, Theodoros *(Medical School, University of Ioannina)*

**16:16-16:18**    ThDT10-04.4

**An Interpretable Data-Driven Approach for Rules Construction: Application to Cardiovascular Risk Assessment**

Mendes, Diana *(Universidade de Coimbra)*; Paredes, Simao *(Instituto Politécnico de Coimbra)*; Rocha, Teresa *(Inst Superior de Eng de Coimbra)*; de Carvalho, Paulo *(University of Coimbra)*; Henriques, Jorge\* *(University of Coimbra)*; Morais, João *(Hospital de Santo André, Leiria)*

**16:20-16:22**    ThDT10-04.6

**Classification Models to Predict Vasopressor Administration for Septic Shock in the Emergency Department**

Prasad, Varesh\* *(Massachusetts Institute of Tech.)*; Lynch, James *(Massachusetts Institute of Tech.)*; Pasakarnis, Corey *(Massachusetts General Hospital)*; Thorsen, Jill *(Massachusetts General Hospital)*; Filbin, Michael *(Massachusetts General Hospital)*; Reisner, Andrew *(Massachusetts General Hospital)*; Heldt, Thomas *(Massachusetts Institute of Tech.)*

**16:22-16:24**    ThDT10-04.7

**Reconciliation of SNOMED CT and Domain Clinical Model for Interoperable Medical Knowledge Creation**

Ali, Taqdir *(Kyung Hee University, South Korea)*; Lee, Sungyoung\* *(Kyung Hee University)*

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**ThDT10-05:**  **16:10-17:10**    Schmitt Room

**Health Informatics – Telemedicine I** (Poster Session)

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**16:10-16:12**    ThDT10-05.1

**Design and Development of a Customizable Telemedicine Platform for Improving Access to Healthcare for Underserved Populations**

Goel, Neha\* *(Johns Hopkins University)*; Alam, Amal Afroz *(Johns Hopkins University)*; Eggert, Emily *(Johns Hopkins University)*; Acharya, Soumyadipta *(Johns Hopkins University)*

**16:12-16:14**    ThDT10-05.2

**Wireless Gyroscope Platform Enabled by a Portable Media Device for Quantifying Wobble Board Therapy**

LeMoyne, Robert\* *(Northern Arizona University)*; Mastroianni, Timothy *(Independent)*

**16:14-16:16**    ThDT10-05.3

**Improving the Accuracy of Existing Camera based Fall Detection Algorithms through Late Fusion**

Baldewijns, Greet *(KU Leuven Campus Geel, AdvISe Technology Lab, Belgium)*; Debard, Glen *(Thomas More Kempen)*; Mertes, Gert\* *(KU Leuven)*; Croonenborghs, Tom *(KU Leuven Campus Geel, AdvISe Technology Lab, Belgium)*; Vanrumste, Bart *(Katholieke Universiteit Leuven)*

**16:16-16:18**    ThDT10-05.4

**An Integrated System for the Monitoring of Therapy and Drug's Side Effects in Lymphoproliferative Disorders**

Vollero, Luca\* *(Università Campus Bio-Medico di Roma)*; Annibali, Ombretta *(UOC Ematologia, Trapianto di Cellule Staminali)*; Schena, Emiliano *(University of Rome Campus Bio-Medico)*; Tomarchio, Valeria *(Campus Biomedico University)*; Cimino, Giuseppe *(Ospedale Santa Maria Goretti, Latina, Italia)*; Cenfra, Natalia *(UOC Ematologia, Ospedale Santa MAria Goretti Latina)*; Avvisati, Giuseppe *(UOC Ematologia Trapainto di cellule Staminali, Università Campus)*

**16:18-16:20**    ThDT10-05.5

**Real-Time WebRTC-Based Design for a Telepresence Wheelchair**

Ha, Van Kha Ly\* *(University of Technology, Sydney)*; Chai, Rifai *(University of Technology, Sydney)*; Nguyen, Hung T. *(University of Technology, Sydney)*

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**ThDT11-01:**  **16:10-17:10**    Greatbatch Room

**Modeling Cellular Function and Structure I** (Poster Session)

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**16:10-16:12**    ThDT11-01.1

**Model Evaluation-Based Approaches for Endothelial Function**

Asami, Naoya\* *(Aichi Prefectural University)*; Yamazaki, Yoichi *(Kwansei Gakuin University)*; Kamiyama, Yoshimi *(Aichi Prefectural University)*

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**16:12-16:14**    ThDT11-01.2

**Tracking of Non-Dividing Cells by using Generalized Voronoi Diagram**

Pengdong, Xiao\* *(National Heart Centre Singapore)*; Zhong, Liang *(National Heart Centre Singapore)*

**16:14-16:16**    ThDT11-01.3

**A Mathematical Model of the Effects of Anoctamin-1 Loss on Intestinal Slow Wave Entrainment**

Qian, Anna *(The University of Auckland)*; Means, Shawn *(The University of Auckland)*; Cheng, Leo K *(The University of Auckland)*; Sneyd, James *(The University of Auckland)*; Du, Peng\* *(The University of Auckland)*

**16:16-16:18**    ThDT11-01.4

**A Computational Model of Intracellular Calcium Oscillations in Urinary Bladder Smooth Muscle Cells**

Gupta, Suranjana\* *(IIT Bombay)*; Majawadia, Avni *(SGSITS, Indore)*; Manchanda, Rohit *(IIT Bombay)*

**16:18-16:20**    ThDT11-01.5

**A Computational Study of the Role of Mitochondrial Organization on Cardiac Bioenergetics**

Ghosh, Shouryadipta *(Univ. of Melbourne)*; Crampin, Edmund *(Univ. of Auckland)*; Hanssen, Eric *(Univ. of Melbourne)*; Rajagopal, Vijayaraghavan\* *(Univ. of Melbourne)*

**16:20-16:22**    ThDT11-01.6

**Cell Dynamic Morphology Analysis by Deep Convolutional Features**

Li, Heng *(Beijing Institute of Technology)*; Liu, Zhiwen\* *(Beijing Institute of Technology)*; Pang, Fengqian *(Beijing Institute of Technology)*; Shi, Yonggang *(Beijing Institute of Technology)*

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**ThDT11-02:**  **16:10-17:10**    Greatbatch Room

**Modeling Medical Devices, Diseases and Therapies I** (Poster Session)

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**16:10-16:12**    ThDT11-02.1

**A Pharmacokinetic Model of Drug-Drug Interaction between Clopidogrel and Omeprazole at CYP 2C19 in Humans**

Tangamornsuksan, Wimonchat *(Naresuan University)*; Thiansupornpong, Pongpak *(Naresuan University)*; Morasuk, Thirawut *(Naresuan University)*; Lohitnavy, Ornrat *(Center of Excellence for Environmental Health and Toxicology, Na)*; Lohitnavy, Manupat\* *(Naresuan University)*

**16:12-16:14**    ThDT11-02.2

**Improved MicroRNA Biomarkers to Predict Stages in Lung Adenocarcinoma via Clustering of MicroRNA-Target Dysregulations**

Tran, Nhat\* *(University of Texas at Arlington)*; Gao, Jean *(University of Texas)*

**16:14-16:16**    ThDT11-02.3

**Multi-Scale Immunological and Biomechanical Model of Emphysema Progression**

Ceresa, Mario\* *(Universitat Pompeu Fabra)*; Olivares, Andy *(University Pompeu Fabra, Barcelona Spain)*; Fernández Suelves, Silvia *(University Pompeu Fabra, Barcelona Spain)*; Noailly, Jérôme *(University Pompeu Fabra, Barcelona Spain)*; Gonzalez Ballester, Miguel Angel *(Universitat Pompeu Fabra)*

**16:16-16:18**    ThDT11-02.4

**A Continuum Model of Electrical Stimulation of Multi-Compartment Retinal Ganglion Cells**

Alqahtani, Abdulrahman\* *(Univ. of New South Wales)*; Al Abed, Amr *(Univ. of New South Wales)*; Guo, Tianruo *(Univ. of New South Wales)*; Lovell, Nigel H. *(Univ. of New South Wales)*; Dokos, Socrates *(Univ. of New South Wales)*

**16:18-16:20**    ThDT11-02.5

**The Tensile Stress Caused Nonuniform Degradation of a Poly (lactic-Co-Glycolic Acid) Stent – A Finite Element Analysis**

Guo, Meng *(Beihang University)*; Chu, Zhaowei *(Beihang University)*; Yao, Jie *(Beihang University)*; Feng, Wentao *(Beihang University)*; Wang, Lizhen *(Beihang University)*; Fan, Yubo\* *(Beihang University)*

**16:20-16:22**                                   ThDT11-02.6
**In Silico Investigation of the Effects of Hemolysis on the Hyperspectral Absorptance of Blood in Motion**
Van Leeuwen, Spencer Richard* *(University of Waterloo)*; Baranoski, Gladimir Valerio Guimaraes *(University of Waterloo)*; Kimmel, Bradley William *(University of Waterloo)*

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**ThDT11-03:** 16:10-17:10                         Greatbatch Room
**Pharamacokinetics, Systems Biology, and Synthetic Biology I** (Poster Session)

**16:10-16:12**                                   ThDT11-03.1
**A Physiologically-Based Pharmacokinetic Model of Methotrexate Incorporating Hepatic Excretion via Multidrug-Resistance-Associated Protein 2 (Mrp2) in Mice, Rats, Dogs, and Humans**
Lohitnavy, Manupat* *(Naresuan University)*; Lu, Yasong *(Dept. of Environmental & Radiological Health Sciences, Colo)*; Lohitnavy, Ornrat *(Center of Excellence for Environmental Health and Toxicology, Na)*; Yang, Raymond *(Dept. of Environmental & Radiological Health Sciences, Colo)*

**16:12-16:14**                                   ThDT11-03.2
**Development of a Physiologically based Pharmacokinetic Model of Paraquat**
Lohitnavy, Manupat* *(Naresuan University)*; Chitsakhon, Arnon *(Center of Excellence for Environmental Health and Toxicology, Na)*; Jomprasert, Kritsada *(Center of Excellence for Environmental Health and Toxicology, Na)*; Lohitnavy, Ornrat *(Center of Excellence for Environmental Health and Toxicology, Na)*; Reisfeld, Brad *(Colorado State University)*

**16:14-16:16**                                   ThDT11-03.3
**ActiveMotif: Interactive Motif Discovery with Human Feedback**
Kim, Younghoon* *(Hanyang University)*; Lee, Woonghee *(Hanyang University)*; Kim, Keonwoo *(Hanyang University)*

**16:16-16:18**                                   ThDT11-03.4
**An in Silico Method to Predict Net Calcium Transfer during Hemodialysis**
Maheshwari, Vaibhav* *(Renal Research Institute)*; Cherif, Alhaji *(Renal Research Institute)*; Fuertinger, Doris *(Renal Research Institute)*; Schappacher, Gudrun *(University of Graz)*; Preciado, Priscila *(Renal Research Institute)*; Thijssen, Stephan *(Renal Research Institute)*; Bushinsky, David *(University of Rochester Medical Center)*; Kotanko, Peter *(Renal Research Institute)*

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**ThDT11-05:** 16:10-17:10                         Greatbatch Room
**Computational Modeling – Biological Networks** (Poster Session)

**16:10-16:12**                                   ThDT11-05.1
**Network Motifs in the Integrated Transcriptional Regulation and Protein Interaction Networks of Shewanella**
Ding, Dewu *(Southeast Univ.)*; Sun, Xiao* *(Southeast Univ.)*

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**ThDT11-06:** 16:10-17:10                         Greatbatch Room
**Computational Modeling – Structural Bioinformatics** (Poster Session)

**16:10-16:12**                                   ThDT11-06.1
**Estimation of Vascular Peripheral Resistance during FMD Test using a Hemodynamics Simulation Model**
Tsukamoto, Akira* *(Aichi Prefectural University)*; Asami, Naoya *(Aichi Prefectural University)*; Kamiyama, Yoshimi *(Aichi Prefectural University)*

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**ThDT11-08:** 16:10-17:10                         Greatbatch Room
**Modeling of Cell, Tissue, and Regenerative Medicine – 2D and 3D Cell Modeling** (Poster Session)

**16:10-16:12**                                   ThDT11-08.1
**A Study on Effects of Intercellular Adhesion on Collective Cell Migration during Re-Epithelialization**
Zhao, Jieling *(Univ. of Illinois at Chicago)*; Cao, Youfang *(Los Alamos National Lab)*; Liang, Jie* *(Univ. of Illinois at Chicago)*

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**ThDT11-09:** 16:10-17:10                         Greatbatch Room
**Models of Medical Devices** (Poster Session)

**16:10-16:12**                                   ThDT11-09.1
**Super-Resolution Photoacoustic Microscopy using a Plasmonic Metal Nanoaperture: A Simulation Study**
Park, Byullee *(POSTECH)*; Kim, Chulhong* *(Pohang University of Science and Technology)*

**16:12-16:14**                                   ThDT11-09.2
**Design of a Tongue Displacement Device for Head and Neck Radiation Therapy**
Na, Chohee *(Sungkyungwan)*; Ju, Sanggyu* *(Samsung Medical Center)*; Ahn, Yong Chan *(Samsung Medical Center)*; Hong, Chae Seon *(Samsung Medical Center)*; Oh, Dongryul *(Samsung Medical Center)*

**16:14-16:16**                                   ThDT11-09.3
**Contact Pressure Distribution Analysis of Ultrasonic Scalpels using Finite Element Method**
Kim, Tae Hyong *(Sungkyunkwan Univ.)*; Youn, Su Hyun *(Sungkyunkwan Univ.)*; Jung, Hyunwoo *(Sungkyunkwan Univ.)*; Lee, Dong Jun *(Sungkyunkwan Univ.)*; Mun, Joung Hwan *(Sungkyunkwan Univ.)*; Kim, Hyunggun* *(Sungkyunkwan Univ.)*

**16:16-16:18**                                   ThDT11-09.4
**Reverse Engineering of Medical Device using 3D Scanning and Geomagic Design X**
Choi, Chang Jun* *(Medical Device Development Center, KBIO)*; Ahn, Jin Woo *(KBIO)*; Kim, Guk Han *(Daesung Maref Co., Ltd.)*; Moon, Jin-hee *(Medical Device Development Center of Osong Medical Innovation Fo)*

**16:18-16:20**                                   ThDT11-09.5
**Heat Transfer Analysis of Electrode with Saline Irrigation for Radiofrequency Cardiac Ablation**
Ahn, Jin Woo* *(KBIO)*; Lee, Seung-A *(Osong Medical Innovation Foundation)*; Lee, Kang Moo *(KBIO)*; Jung, Hachul *(KBIO)*; Lee, Sanghun *(Osong Medical Innovation Foundation)*; Moon, Jin-hee *(Medical Device Development Center of Osong Medical Innovation Fo)*

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**ThDT11-10:** 16:10-17:10                         Greatbatch Room
**Models of Organ Physiology** (Poster Session)

**16:10-16:12**                                   ThDT11-10.1
**Numerical Simulations of Optical Coherence Tomography (OCT)-Derived Non-Invasive Fractional Flow Reserve in a Patient-Specific Coronary Region of Interest by using Vessel-Length Method**
Lee, Kyung Eun *(Kangwon National Univ.)*; Shin, Sung Woong *(Dept. of Mechnical & Biomedical Engineering, Kangwon Nation)*; Shim, Eun Bo* *(Kangwon National Univ.)*

**16:12-16:14**                                   ThDT11-10.2
**Mechanistic Insight into Electro-Mechanical Responses of Human Failing Ventricle under D172N KCNJ2 Mutation during Reentrant: A Simulation Study**
Heikhmakhtiar, Aulia Khamas *(Kumoh National Institute of Tech.)*; Rasyidin, Fakhmi Adi *(Kumoh National Institute of Tech.)*; Jeong, Daun *(Kumoh National Institute of Tech.)*; Baek, DongGuen *(Kumoh National Institute of Tech.)*; Lim, Ki Moo* *(Kumoh National Institute of Tech.)*

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**ThDT12-01:** 16:10-17:10                         Geddes Room
**Ambulatory Diagnostic and Therapeutic Devices – Ambulatory and ADL Technologies** (Poster Session)

**16:10-16:12**                                   ThDT12-01.1
**Vocal Stereotypy Detection: Initial Step to Communication with Non-Verbal Children with Autism**
Fetzner, John *(University of St. Thomas)*; Min, Cheol-Hong* *(University of St. Thomas)*

ThDT12-02: 16:10-17:10        Geddes Room
**Ambulatory Diagnostic Devices –**
**Point of Care Technologies** (Poster Session)

16:10-16:12        ThDT12-02.1
**An Optical System for Monitoring Urine Components for**
**Home Healthcare – Accuracy Assessment using**
**Urine from Multiple Diabetic Subjects**
  Suzuki, Ikuto* *(Graduate School of Natural Science &*
*Technology, Kanazawa Univer)*; Seino, Kimihiro *(Kanazawa*
*Univ.)*; Nogawa, Masamichi *(Kanazawa Univ.)*; Naito, Hisashi
*(Kanazawa Univ.)*; Ikarashi, Akira *(Aino Univ.)*; Ogawa,
Mitsuhiro *(Teikyo Univ.)*; Yamakoshi, Ken-ichi *(Kanazawa*
*Univ.)*; Tanaka, Shinobu *(Kanazawa Univ.)*

16:12-16:14        ThDT12-02.2
**Portable Fluorescence Reader for Low Cost Detection of**
**Chlamydia Trachomatis and Neisseria Gonorrhoeae**
  Radhakrishnan, Geethanjali* *(Adiuvo Diagnostics PVT Ltd)*;
Radhakrishnan, Geethanjali *(Adiuvo Diagnostics PVT Ltd)*;
Saluja, Daman *(University of Delhi)*; Wasnik, Kirti *(DSS Image*
*Tech)*; Khandhari, Ajay *(DSS Image Tech)*

16:14-16:16        ThDT12-02.3
**Study on a Portable Wireless Device for**
**Hematocrit Level Monitoring**
  Lee, Dae-Sik* *(ETRI)*

ThDT12-04: 16:10-17:10        Geddes Room
**Cardiovascular Assessment and Diagnostic**
**Technologies** (Poster Session)

16:10-16:12        ThDT12-04.1
**A Visually Assistive Approach for the Diagnosis of Heart**
**Murmurs by using Time-Frequency Transform Techniques**
  Lin, Hong *(National Taipei Univ. of Technology)*; Chen, Hung-
En *(National Taipei Univ. of Technology)*; Lu, Chih-Cheng*
*(National Taipei Univ. of Technology)*

16:12-16:14        ThDT12-04.2
**Application of High-Resolution CMOS Flat Panel Detector for**
**Fluoroscopy on Mobile C-Arm System**
  Cha, Bo Kyung* *(KERI)*

ThDT12-05: 16:10-17:10        Geddes Room
**Clinical Engineering** (Poster Session)

16:10-16:12        ThDT12-05.1
**MCNP6 Neutron Detector Simulation Validation using a**
**Varian True Beam LinAc**
  Morató, Sergio* *(Inst. for Industrial, Radiophysical &*
*Environmental Safety)*; Martinez, Lucia *(ISIRYM)*; Juste, Belen
*(Polytechnic Univ. of Valencia)*; Miró, Rafael *(Polytechnic Univ. of*
*Valencia)*; Verdú, Gumersindo *(Polytechnic Univ. of Valencia)*

16:12-16:14        ThDT12-05.2
**Development of New Type Tourniquet using**
**EHD Pump as Driving Source**
  Takei, Yusuke* *(Univ of Tokyo Denki)*

16:14-16:16        ThDT12-05.3
**Seizure Prediction and Mechanism Analysis of Generalized**
**Epilepsy based on Heart Rate Variability**
  Sakane, Fumiya* *(Kyoto Univ.)*; Fujiwara, Koichi *(Kyoto Univ.)*;
Miyajima, Miho *(Tokyo Medical and Dental Univ.)*; Suzuki, Yoko
*(Tokyo Medical and Dental Univ.)*; Yamakawa, Toshitaka
*(Kumamoto Univ.)*; Kano, Manabu *(Kyoto Univ.)*; Maehara,
Taketoshi *(Tokyo Medical and Dental Univ.)*

16:16-16:18        ThDT12-05.4
**3D-Printed Foldable Indirect Ophthalmoscope for**
**Smartphone**
  Kim, Geonyoung *(Seoul National Univ.)*; An, Jieun *(Seoul*
*National Univ.)*; Baek, Changhoon *(Seoul National Univ.)*; Seo,
Jong Mo* *(Seoul National Univ., School of Engineering)*

ThDT12-06: 16:10-17:10        Geddes Room
**Clinical Engineering – Device Alarm, Alert, and**
**Communication Systems** (Poster Session)

16:10-16:12        ThDT12-06.1
**Detection of Facial Palsy for Stroke Patients**
**using Face Recognition**
  Nam, Gibaek *(Health-IT Acceleration Center, Yonsei Univ.*
*College of Medi)*; Shin, Yeongcheol *(Health-IT Acceleration*
*Center, Yonsei Univ. College of Medi)*; Park, Eunjeong
*(Cardiovascular Research Institute, Yonsei Univ. College of)*;
Chang, Hyuk-Jae* *(Dept. of Internal Medicine, Severance*
*Cardiovascular Hospital)*

16:12-16:14        ThDT12-06.2
**A Flow Rate Monitor for Intravenous PCA Infusion Systems**
  Ro, Jung Hoon* *(Pusan National University)*

ThDT12-07: 16:10-17:10        Geddes Room
**Clinical Laboratory, Assay and Pathology**
**Technologies** (Poster Session)

16:10-16:12        ThDT12-07.1
**Development of Oxygen Tension Controllable Microfluidic**
**Cover Device for Commercial Cell Culture Plate**
  Lee, Seung Yeob *(GIST)*; Yang, Sung* *(Gwangju Institute of*
*Science and Technology (GIST))*

16:12-16:14        ThDT12-07.2
**The Efficacy of Non-Invasive Skin Measurement Devices**
  Yang, Hye Min *(Sungkyunkwan Univ.)*; Lee, Jong Hee* *(Samsung*
*Medical Center, Sungkyunkwan Univ. School of Medici)*

16:14-16:16        ThDT12-07.3
**3-D Photoacoustic Imaging using Capacitive Micromachined**
**Ultrasonic Transducer (CMUT) 2-D Sparse Array**
  Kim, Young Hun *(Hanyang University)*;
Park, Kwan Kyu* *(Hanyang University)*

16:16-16:18        ThDT12-07.4
**Encoded Microparticle Array for Protein**
**Capture from Skin Surface**
  Oh, Dong Yoon* *(Seoul National University)*; Song, Seowoo
*(Seoul National University)*; Kwon, Sunghoon *(Dept. of*
*Electrical and Computer Engineering, Seoul National)*

ThDT12-08: 16:10-17:10        Geddes Room
**Diagnostic Devices – Physiological Monitoring** (Poster Session)

16:10-16:12        ThDT12-08.1
**Microplate-Based Colorimetric Assay for the Detection of**
**Hydrogen Sulfide from Living Cells**
  Ahn, Yong Jin *(Kyung Hee Univ.)*; Lee, Young Ju *(Kyung Hee*
*Univ.)*; Lee, Jaemyeon *(Kyunghee Univ.)*; Lee, Doyeon *(Kyung*
*Hee Univ.)*; Lee, Gi-Ja* *(Kyung Hee Univ.)*

16:12-16:14        ThDT12-08.2
**Detection of Scleral Structure with Glass Microneedle Insertion**
  Park, Seung Hyun *(Yonsei University)*; Ryu, Suho *(Yonsei*
*University)*; Yun, Jae Hyoung *(Yonsei University)*; Joo, Chulmin
*(Yonsei University)*; Ryu, WonHyoung* *(Yonsei University)*

16:14-16:16        ThDT12-08.3
**Development of Respiratory Volume Analyzer**
**using Pressure Change Analysis**
  U, One Sang *(Kangwon National University)*;
Kang, Seong Min *(Kangwon National University)*;
Choi, Seong Wook* *(Kangwon National University)*

16:16-16:18        ThDT12-08.4
**Current Trends of Standardization on Medical Devices in**
**Traditional Medicine**
  Moon, Jinseok* *(Korea Institute of Oriental Medicine)*;
Choi, Jeong-Hee *(Korea Institute of Oriental Medicine)*;
Lim, Chang-Sung *(Korea Institute of Oriental Medicine)*;
Choi, Sun-mi *(Korea Institute of Oriental Medicine)*

**16:18-16:20**      **ThDT12-08.5**

**Raman Spectral Characteristics under Varying Skin Temperature**
Kim, Soogeun* *(Kyung Hee University)*; Shin, Younggwon *(Kyung Hee University)*; Byun, Kyung Min *(Kyung Hee University)*; Lee, Soo Yeol *(Kyung Hee University)*

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**ThDT12-09:** 16:10-17:10      Geddes Room
**FNIR and Near-Infrared Scanning and Assessment** (Poster Session)

**16:10-16:12**      **ThDT12-09.1**

**A Magnetohydrodynamic Study for Magnetic Therapies**
Nakagawa, Hidenori* *(Tokyo Denki University)*; Ohuchi, Mikio *(Tokyo Denki University)*

**16:12-16:14**      **ThDT12-09.2**

**Sensitivity Analysis for Detecting Oxygen Saturation of Deep Veins with Non-Invasive Near Infrared Spectroscopy**
Wang, Chiao-Yi* *(National Taiwan Univ.)*; Yu, Ting-Wen *(National Taiwan Univ.)*; Sung, Kung-Bin *(National Taiwan Univ.)*

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**ThDT13-01:** 16:10-17:10      Dunn Room
**Artificial Organs (Including Heart, Kidney, Liver, Pancreas, Retina)** (Poster Session)

**16:10-16:12**      **ThDT13-01.1**

**Mock System for In-Vitro Test of Wearable Artificial Kidney**
Lim, Hyung Soo *(Seoul National University)*; Cho, Woo Sang *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*

**16:12-16:14**      **ThDT13-01.2**

**Optical Tissue Phantom Simulating Skin Pigmentation**
Park, Jihoon *(Yonsei Univ.)*; Jung, Byungjo* *(Yonsei Univ.)*

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**ThDT13-03:** 16:10-17:10      Dunn Room
**Heart and Circulatory Support Devices** (Poster Session)

**16:10-16:12**      **ThDT13-03.1**

**Sensorless Detection of Venous Collapse during Extracorporeal Membrane Oxygenation**
Kim, Hyunsoo *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*; Kim, Hee Chan *(Seoul National University)*

**16:12-16:14**      **ThDT13-03.2**

**Mechano-Chronotropic Unloading in Acute Myocardial Infarction Markedly Reduces Infarct Size and Prevents the Progression of Heart Failure in the Long-Term**
Sunagawa, Genya* *(Kyushu University)*; Saku, Keita *(Kyushu University)*; Sakamoto, Takafumi *(Kyushu University)*; Kishi, Takuya *(Kyushu University Graduate School of Medical Sciences)*; Sunagawa, Kenji *(Kyushu University)*

**16:14-16:16**      **ThDT13-03.3**

**Preclinical Efficacy Evaluation for the Development of Coronary Drug-Eluting Stents at DGMIF-LAC**
Ryu, Rae-Hyung* *(Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF))*; An, Sang-Hyun *(Laboratory Animal Center (LAC), Daegu-Gyeongbuk Medical Innovati)*; Kim, Jun-Sik *(Laboratory Animal Center (LAC), Daegu-Gyeongbuk Medical Innovati)*; Kim, Choong-Yong *(Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF))*; Kum, Chang-Hun *(Osstem Cardiotec)*

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**ThDT13-04:** 16:10-17:10      Dunn Room
**Image-Guided Devices – Biopsy** (Poster Session)

**16:10-16:12**      **ThDT13-04.1**

**Automatic Classification of Spinal Cord Tumors using Autofluorescence Spectroscopy Analysis**
Zhu, Mingyu *(Tsinghua University)*; Chen, Fang *(Dept. of Biomedical Engineering)*; Yang, Feng *(Beijing Tsinghua Chang Gung Hospital)*; Liao, Hongen* *(Tsinghua University;)*

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**ThDT13-05:** 16:10-17:10      Dunn Room
**Image-Guided Devices – HIFU** (Poster Session)

**16:10-16:12**      **ThDT13-05.1**

**Basic Study on Vessel Tracking Algorithm using HSV Model in Ultrasonic Superficial Varicose Vein Therapy**
Kim, Ju Young *(Inje Univ.)*; Song, Hayoung *(Inje Univ.)*; Kim, Seong Cheol *(inje Univ.)*; Noh, Si Cheol *(International Univ. of Korea)*; Choi, Heung Ho* *(Inje Univ.)*

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**ThDT13-06:** 16:10-17:10      Dunn Room
**Image-Guided Devices – Interstitial Thermal Therapy** (Poster Session)

**16:10-16:12**      **ThDT13-06.1**

**Quantitative Evaluation of Tumor Response to Magnetic Hyperthermia Treatment Combined with Chemotherapy using Magnetic Particle Imaging**
Ohki, Akiko* *(Graduate School of Medicine, Osaka University)*; Tanoue, Minori *(Osaka University)*; Kobayashi, Sayumi *(Osaka University)*; Murase, Kenya *(Osaka University)*

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**ThDT13-07:** 16:10-17:10      Dunn Room
**Image-Guided Devices – MRI-Compatible Instrumentation and Device Management** (Poster Session)

**16:10-16:12**      **ThDT13-07.1**

**Mechanism Design of a Compact 4-DOF Robotic Needle Guide for MRI-Guided Prostate Intervention**
Zhang, Shihao *(University of Central Florida)*; Saenz Aldea, Eduardo *(University of Central Florida)*; Biswas, Pradipta *(University of Central Florida)*; Simms, Leslie Simms *(University of Central Florida)*; Singh, Shane *(University of Central Florida)*; Ortiz Nieves, Marilu *(University of Central Florida)*; Song, Sang-Eun* *(University of Central Florida)*

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**ThDT13-08:** 16:10-17:10      Dunn Room
**Image-Guided Devices – RF and Microwave Ablation** (Poster Session)

**16:10-16:12**      **ThDT13-08.1**

**Microwave Ablation Planning and Monitoring using Nanoparticle Enhanced Through-Transmission Ultrasound**
Perlman, Or* *(Technion - Israel Institute of Technology)*; Weitz, Iris Sonia *(ORT Braude College)*; Azhari, Haim *(Technion - Israel Institute of Technology)*

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**ThDT13-09:** 16:10-17:10      Dunn Room
**Muscle Stimulation** (Poster Session)

**16:10-16:12**      **ThDT13-09.1**

**Evaluation of Potential Therapeutic Effects by using Multi-Mechanical Stimulation in Muscle Atrophy**
Hwang, Dong Hyun *(Yonsei Univ.)*; Kim, Seo Hyun *(Yonsei University, Dept. of Biomedical Engineering)*; Lee, Han A *(Yonsei Univ.)*; Kim, HanSung* *(Yonsei Univ.)*

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**ThDT13-10:** 16:10-17:10      Dunn Room
**Neural Stimulation (Including Deep Brain Stimulation)** (Poster Session)

**16:10-16:12**      **ThDT13-10.1**

**in Vivo Mapping of Brain Response during Electrical Stimulation using MREIT**
Katoch, Nitish *(Kyung Hee University)*; Choi, Bup Kyung *(Kyung Hee University)*; Sajib, Saurav Z K *(Kyung Hee University)*; Kim, Hyung Joong *(Kyung Hee University)*; Kwon, Ohin *(Konkuk University)*; Woo, Eung Je* *(Kyung Hee University)*

**16:12-16:14**      **ThDT13-10.2**

**Deep Brain Stimulation Modulates 200-400Hz Local Field Potentials**
Sinclair, Nicholas Campbell* *(Bionics Institute)*; Perera, Thushara *(Bionics Institute)*; Fallon, James *(Bionics Institute)*; Bulluss, Kristian *(St Vincent's Hospital)*; Thevathasan, Wesley *(Bionics Institute)*; McDermott, Hugh *(Bionics Institute)*

**ThDT14-01:** 16:10-17:10           Schaldach Room
**Retinal Imaging** (Poster Session)

16:10-16:12           ThDT14-01.1
**Retinal Vessel Segmentation using
Second-Order Image Moments**
    Tiwari, Ashwani Kumar *(Wipro)*; Kanhangad, Vivek* *(Indian Inst. of
    Tech. Indore)*; Pachori, Ram Bilas *(Indian Inst. of Tech. Indore)*

**ThDT14-02:** 16:10-17:10           Schaldach Room
**Retinal Vascular Imaging** (Poster Session)

16:10-16:12           ThDT14-02.1
**Improvement of Retinal Vessel Segmentation by Combination
of Multiple Segmentation Algorithms**
    Rieger, Steffen* *(TU Ilmenau)*; Baumgarten, Daniel *(Ilmenau
    University of Technology)*; Dutz, Silvio *(Ilmenau University of
    Technology)*; Klee, Sascha *(Ilmenau University of Technology)*

**ThDT14-03:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Breast** (Poster Session)

16:10-16:12           ThDT14-03.1
**A New Modified Homographic Registration Method based on
SIFT Algorithm for 3-D Automated Breast Ultrasound System
with Dual Wide Field-of-View Scanners**
    Lee, Hojung *(Sogang Univ.)*; Kang, Jinbum *(Sogang Univ.)*;
    Song, Ilseob *(Sogang Univ.)*; Yoo, Yangmo* *(Sogang Univ.)*

**ThDT14-04:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Doppler** (Poster Session)

16:10-16:12           ThDT14-04.1
**A Wide Field of View Microvascular Imaging using a Curved
Array Transducer and Diverging Transmit Beams**
    Go, Dooyoung *(Sogang University)*; Kang, Jinbum *(Sogang
    University)*; Yoo, Yangmo* *(Sogang University)*

**ThDT14-05:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Elastography** (Poster Session)

16:10-16:12           ThDT14-05.1
**Ultrasound Image Reconstruction using Compressive Sensing**
    Ni, Pavel *(Gwangju Institute of Science and Tech.)*; Lee,
    Heung-No* *(Gwangju Institute of Science and Tech. (GIST))*

16:12-16:14           ThDT14-05.2
**The Feasibility of the SWE with a Transvaginal Transducer for
the Evaluation of Uterine Fibroids HIFU Therapy**
    Kim, Heeran* *(Sogang Univ.)*; Bae, Sua *(Sogang Univ.)*; Kim,
    Pilsu *(Sogang Univ.)*; Kim, Kidong *(Seoul National Univ.
    Bundang Hospital)*; Jeong, Jiyeoun *(Seoul National Univ.
    Bundang Hospital)*; Song, Tai-Kyong *(Sogang Univ.)*

16:14-16:16           ThDT14-05.3
**Phase Aberration Correction using Average
Sound Speed for SWEI**
    Kim, Heeran* *(Sogang Univ.)*; Bae, Sua *(Sogang Univ.)*; Yoon,
    Changhan *(Inje Univ.)*; Song, Tai-Kyong *(Sogang Univ.)*

16:16-16:18           ThDT14-05.4
**A Multimodal Biomicroscopic System based on High-
Frequency Ultrasound Elaostography and Multispectral
Imaging Techniques for Tissue Characterization Ex Vivo**
    Kim, Jihun* *(DGIST)*; Kim, Jun-Young *(Kyungpook National
    Univ. Hospital)*; Seo, Anna *(Kyungpook National Univ.)*; Kim,
    Eunjoo *(Daegu Gyeongbuk Inst. of Science & Tech.)*; Hwang,
    Jae Youn *(Daegu Gyeongbuk Inst. of Science and Tech.)*

**ThDT14-06:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Interventional** (Poster Session)

16:10-16:12           ThDT14-06.1
**Analysis of X-Ray Induced Acoustic Waves for a
New Intratherapy Dosimetry**
    Park, Eunyeong *(Pohang Univ. of Science and Tech. (POSTECH))*;
    Kim, Chulhong* *(Pohang Univ. of Science and Tech.)*

**ThDT14-07:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Other Organs** (Poster Session)

16:10-16:12           ThDT14-07.1
**A New Synthetic Aperture Technique using Plane Waves:
Exact Solution and Experimental Verification**
    Song, Hyunwoo* *(Sogang Univ.)*; Song, Tai-Kyong *(Sogang Univ.)*

16:12-16:14           ThDT14-07.2
**Ultrasound Harmonic Imaging using
Narrow-Band Signal Synthesis**
    Lee, Kunkyu* *(Sogang Univ)*; Bae, Sua *(Sogang University)*;
    Song, Tai-Kyong *(Sogang University)*

16:14-16:16           ThDT14-07.3
**Fermat's Spiral Scanning for 3D Plane Wave Ultrasound Imaging**
    Bae, Sua* *(Sogang Univ.)*; Song, Tai-Kyong *(Sogang Univ.)*

16:16-16:18           ThDT14-07.4
**Reconstruct Ultrasonic Muscle Image to Analyze
Muscle Density for Sarcopenia**
    Song, Yu-Lin* *(Asia University)*

**ThDT14-08:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Prenatal** (Poster Session)

16:10-16:12           ThDT14-08.1
**A New High Definition Multi-Planar Reconstruction Method
with Voxel based Beamforming in 3-D Ultrasound Imaging**
    Kim, Sung Chan *(Sogang Univ.)*; Kang, Jinbum *(Sogang Univ.)*;
    Song, Ilseob *(Sogang Univ.)*; Yoo, Yangmo* *(Sogang Univ.)*

**ThDT14-09:** 16:10-17:10           Schaldach Room
**Ultrasound Imaging – Vascular Imaging** (Poster Session)

16:10-16:12           ThDT14-09.1
**Characterization of Atherosclerotic Plaques in IVUS Image using
Co-Occurrence Matrix and Gabor Filter with Random Forests**
    Huang, Zhijie *(Institute of Medical Information, School of
    Biomedical Engineeri)*; Wang, Qing* *(Southern Medical Univ.)*

16:12-16:14           ThDT14-09.2
**Laser-Induced Thermal Strain Imaging for Lipid Differentiation**
    Choi, Changhoon *(Pohang Univ. of Science and Technology)*;
    Ahn, Joongho *(Pohang Univ. of Science and Technology)*;
    Jeon, Seungwan *(Pohang Univ. of Science and Technology)*;
    Kim, Chulhong* *(Pohang Univ. of Science and Technology)*

**ThDT14-10:** 16:10-17:10           Schaldach Room
**Functional Image Analysis** (Poster Session)

16:10-16:12           ThDT14-10.1
**Altered Resting-State Functional Connectivity in
Adolescent Major Depressive Disorder**
    Han, Kiwan* *(National Center for Mental Health)*; Lee,
    Hyeongrae *(National Center for Mental Health)*; Park, Subin
    *(National Center for Mental Health)*

16:12-16:14           ThDT14-10.2
**Development of a Method for Assessing the Function of
Pulmonary Mucociliary Transport using
Magnetic Particle Imaging**
    Murase, Kenya* *(Osaka University)*

16:14-16:16           ThDT14-10.3
**Discrimination Analysis of Patients with Major Depressive
Disorder using Resting-State Functional Connectivity**
    Lee, Hyeongrae* *(Natl. Center for Mental Health)*; Lee, Dong-
    Kyun *(Natl. Center for Mental Health)*; Sim, M. *(Natl. Center for
    Mental Health)*; Lee, J.H. *(Natl. Center for Mental Health)*

16:16-16:18           ThDT14-10.4
**Temporal Functional Network Connectivity Dynamics in
Fibromyalgia Patients – An Exploratory fMRI Study**
    Jarrahi, Behnaz* *(Stanford Univ.)*; Martucci, Katherine *(Stanford
    School of Medicine)*; Nilakantan, Aneesha *(Stanford School of
    Medicine)*; Mackey, Sean *(Stanford Univ. School of Medicine)*

**ThDT14-11:** 16:10-17:10             Schaldach Room
**Image Enhancement** (Poster Session)

16:10-16:12                 ThDT14-11.1
**Improvement of Conductivity Images using Independent Component Analysis for Visualizing Obstructive Sleep Apnea**
Ayoub, Ghazal *(Kyunghee University)*; Kim, Young Eun *(Kyung Hee University)*; Oh, Tong In* *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*

16:12-16:14                 ThDT14-11.2
**Directional Two-Dimensional Synthetic Aperture Focusing Technique for Photoacoustic Microscopy**
Jeon, Seungwan *(Pohang Univ. of Science and Technology)*; Park, Jihoon *(Pohang Univ. of Science and Technology)*; Managuli, Ravi *(Hitachi Aloka Medical America, Inc.)*; Kim, Chulhong* *(Pohang Univ. of Science and Technology)*

**ThDT14-12:** 16:10-17:10             Schaldach Room
**Image Visualization** (Poster Session)

16:10-16:12                 ThDT14-12.1
**An Automated Tracking System for Quantifying Morphological Dynamics of Golgi Tubules**
Yaothak, Jindaporn *(Chung Yuan Christian University)*; Lin, Chun-Cheng *(National Chin-Yi University of Technology)*; Simpson, Jeremy C. *(University College Dublin)*; Tsai, Yuh-Show* *(Chung Yuan Christian University)*

16:12-16:14                 ThDT14-12.2
**Deformable Body Formulation for Virtual Surgery**
Kuocheng, Wang *(Univ. of Illinois at Urbana-Champaign)*; Kesavadas, Thenkurussi* *(Univ. of Illinois at Urbana-Champaign)*

**ThDT15-01:** 16:10-17:10             Webster Room
**Cardiac Mechanics, Structure and Function – Cardiac Structure from Imaging** (Poster Session)

16:10-16:12                 ThDT15-01.1
**A Virtual Reality Environment for Virtual Heart Modelling**
Pengdong, Xiao *(National Heart Centre Singapore)*; Zhao, Xiaodan *(National Heart Centre Singapore)*; Tan, Ru San *(National Heart Center)*; Wong, Philip *(National Heart Centre Singapore)*; Zhong, Liang* *(National Heart Centre Singapore)*

**ThDT15-03:** 16:10-17:10             Webster Room
**Cardiovascular Regulation – Blood Pressure Variability** (Poster Session)

16:10-16:12                 ThDT15-03.1
**Pre-Ejection Period Estimation using Ballistocardiogram and Electrocardiogram Measured on Chest for Continuous Blood Pressure Monitoring**
Yang, Seungman *(Seoul National Univ.)*; Park, Jonghyun *(Seoul National Univ., Graduate School)*; Lee, Joonnyong *(Seoul National Univ.)*; Sohn, Jangjay *(Seoul National Univ.)*; Yoo, Byeongwook *(Interdisciplinary Program of Bioengineering, Seoul National Univ)*; Lee, Saram *(Seoul National Univ. Hospital)*; Kim, Hee Chan* *(Seoul National Univ.)*

**ThDT15-04:** 16:10-17:10             Webster Room
**Cardiovascular Regulation – Heart Rate Variability** (Poster Session)

16:10-16:12                 ThDT15-04.1
**A Study on Heart Rate Variability Related to Internet Game Addiction**
Hong, Sung jun *(Hanyang University)*; Kim, Dohyun *(Hanyang University)*; Park, Jinsick *(Hanyang University)*; Lee, Jong-Shill *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

16:12-16:14                 ThDT15-04.2
**Effects of Exercise Training on Heart Rate Variability in Response to Restraint Stress**
Park, Dajeong* *(Korea Institute of Science and Technology)*; Park, Sunghee *(Korea Institute of Science and Technology)*; Seong, Joon-Kyung *(Korea University)*; Youn, Inchan *(Korea Institute of Science and Technology)*

**ThDT15-05:** 16:10-17:10             Webster Room
**Cellular and Molecular Cardiorespiratory Engineering – Cardiovascular Regeneration** (Poster Session)

16:10-16:12                 ThDT15-05.1
**Fibroblast-Derived Matrix-Coated Anti-Inflammatory Scaffold for Renal Tissue Regeneration**
Kim, Yun Ah *(Korea Institute of Science and Tech.)*; Lih, Eugene *(Korea Institute of Science and Tech.)*; Han, Cheol-Min *(Korea Institute of Science and Tech.)*; Koh, Won-Gun *(Yonsei Univ.)*; Joung, Yoon Ki *(Korea Institute of Science and Tech.)*; Han, Dong Keun* *(Korea Institute of Science and Tech.)*

**ThDT15-06:** 16:10-17:10             Webster Room
**Coronary Artery Disease** (Poster Session)

16:10-16:12                 ThDT15-06.1
**A Newly Derived Method which Seems to Replace the Fractional Flow Reserve without Hyperemia and Passage of Wire**
Choi, Joon Hyuk* *(Jeju National Univ. Hospital)*; Kang, Gwansuk *(Jeju National Univ.)*; Choi, Min Joo *(Jeju National Univ.)*; Joo, Seung-Jae *(Jeju National Univ. Hospital)*

**ThDT15-07:** 16:10-17:10             Webster Room
**Coronary Blood Flow** (Poster Session)

16:10-16:12                 ThDT15-07.1
**Using Computational Fluid Dynamics to Assess Functional Significance of Tandem Coronary Lesions**
Zhang, Jun-Mei *(National Heart Center)*; Low, Ris *(National Heart Center Singapore)*; Huo, Yunlong *(Purdue University)*; Kassab, Ghassan *(Purdue University)*; Lim, Soo Teik *(National Heart Centre Singapore)*; Tan, Ru San *(National Heart Center)*; Zhong, Liang* *(National Heart Centre Singapore)*

**ThDT15-08:** 16:10-17:10             Webster Room
**Vascular Mechanics and Hemodynamics – Arterial Pressure in Cardiovascular Disease** (Poster Session)

16:10-16:12                 ThDT15-08.1
**A Study of LVAD Pressure Waveforms Measured at the Radial Artery using a Mock Circulatory System**
Lee, Ju-Yeon* *(Institute of Applied Medical Engineering, Helmholtz Institute)*; Jansen-Park, So-Hyun *(Dept. of Cardiovascular Engineering, Institute of Applied)*; Lommel, Moritz *(Dept. of Cardiovascular Engineering, Institute of Applied)*; Kang, HeeJung *(Daeyomedi Co., Ltd)*; Shin, Sang Hoon *(Sangji University Oriental Biomedical Engineering)*; Steinseifer, Ulrich *(RWTH Aachen University)*

16:12-16:14                 ThDT15-08.2
**Model-Based Oscillometric Central Blood Pressure Monitoring**
Natarajan, Keerthana *(Michigan State Univ.)*; Cheng, Hao-min *(Taipei Veterans General Hospital)*; Liu, Jiankun *(Michigan State Univ.)*; Gao, Mingwu *(Michigan State Univ.)*; Sung, Shih-Hsien *(Taipei Veterans General Hospital)*; Chen, Chen-Huan *(National Yang-Ming Univ.)*; Hahn, Jin-Oh *(Univ. of Maryland)*; Mukkamala, Ramakrishna* *(Michigan State Univ.)*

**ThDT15-09:** 16:10-17:10             Webster Room
**Vascular Mechanics and Hemodynamics – Vascular Disease** (Poster Session)

16:10-16:12                 ThDT15-09.1
**Finite Element Analysis of Self-Expanding Nitinol Stent under Torsion and Shortening Conditions of Superficial Femoral Artery**
Zhu, Xiaodong* *(Waseda Univ.)*; Umezu, Mitsuo *(Waseda Univ. Graduate School)*; Iwasaki, Kiyotaka *(Waseda Univ.)*

16:12-16:14                 ThDT15-09.2
**Mussel Inspired Self-Expandable Tubular Hydrogel with Shape Memory under NIR for Potential Biomedical Application**
Obiweluozor, Francis* *(Chonbuk National University)*; Ghavaminejad, Amin *(Chonbuk National University)*; Maharjan, Bikendra *(Chonbuk National University)*; Kim, Jinwoo *(Chonbuk National University)*; Park, Chan Hee *(Chonbuk National University)*; Kim, Cheol Sang *(Chonbuk National University)*

**ThDT16-01:** 16:10-17:10　　　　　　　　　Rushmer Room
**Applied Tissue and Organ Models and
Motion Analysis** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-01.1
**Three Dimensional Active Relocation Test for
Shoulder Joint Proprioception during Shoulder
Flexion with and without a Load**
　Kong, Juae *(Hoseo University)*; Park, Subin *(Hoseo University)*;
Park, Chanwon *(Hoseo University)*; Park, Hyunjung *(Hoseo
University)*; Hwang, Seonhong\* *(Yonsei University)*

**ThDT16-02:** 16:10-17:10　　　　　　　　　Rushmer Room
**Dynamics in Musculoskeletal Biomechanics** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-02.1
**Evaluation of Standing Balance in Patients with
Idiopathic Scoliosis**
　Yoo, Hakje *(Sungkyunkwan University)*; Sim, Taeyong
*(Sungkyunkwan University)*; Choi, Ahnryul\* *(Catholic Kwandong
University)*; Mun, Joung Hwan *(Sungkyunkwan University)*

16:12-16:14　　　　　　　　　　　　　ThDT16-02.2
**Simulation of Muscle Activity during Cycling with Full and
Reduced Muscle Strengths of the Leg**
　Tagawa, Yoshihiko *(Kurume University)*; Ogata, Yuta\* *(Kurume
University)*; Yamamoto, Naosuke *(Kurume University)*

16:14-16:16　　　　　　　　　　　　　ThDT16-02.3
**Prototype of Bone Conduction Vibration System using
Photoacoustic Effect**
　Wadamori, Naoki\* *(Nagaoka University of Technology)*

**ThDT16-03:** 16:10-17:10　　　　　　　　　Rushmer Room
**Joint Biomechanics** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-03.1
**Effect of a Knee Brace on Knee Position Sense
in the Healthy Adults**
　Ko, Chang-Yong\* *(Rehab. Eng. Research Institute)*; Yunhee,
Chang *(Rehab. Eng. Research Institute)*; Bora, Jung *(Rehab.
Eng. Research Institute)*; Gyoosuk, Kim *(Rehab. Eng. Research
Institute)*; Jeicheong, Ryu *(Rehab. Eng. Research Institute)*

**ThDT16-04:** 16:10-17:10　　　　　　　　　Rushmer Room
**Mechanics of Locomotion and Balance** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-04.1
**Characteristics of Balance Ability and Aging with Time
Period in Sit-to-Stand Five Times Test by IMU Sensor**
　Seo, Jeongwoo *(Konkuk Univ.)*; Kim, Tae Ho *(Konkuk Univ.)*;
Cho, Haemi *(Kokkuk Univ.)*; Tack, Gye-Rae\* *(Konkuk Univ.)*

16:12-16:14　　　　　　　　　　　　　ThDT16-04.2
**Relationship between Sit-to-Stand Five Times Test
and Berg Balance Scale by IMU Sensor**
　Cho, Haemi *(Kokkuk Univ.)*; Kim, Tae Ho *(Konkuk University)*;
Tack, Gye-Rae\* *(Konkuk University)*

**ThDT16-05:** 16:10-17:10　　　　　　　　　Rushmer Room
**Modeling and Simulation in Biomechanics –
Orthotics** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-05.1
**Simulation of Counter-Pulsation Control VAD of Arrhythmia
Patients using 4-Element Windkessel Model**
　Kim, Joon Yeong *(Kangwon National University)*; Kang, Seong
Min *(Kangwon National University)*; Choi, Seong Wook\*
*(Kangwon National University)*

16:12-16:14　　　　　　　　　　　　　ThDT16-05.2
**Control of Real-Liver-Model Elasticity using Hydraulic
Powered Vein-Like Channel**
　Saito, Kenjiro *(Teikyo Heisei University)*; Kim, Daeyoung
*(Teikyo Heisei University)*; Kobayashi, Etsuko\* *(The University
of Tokyo)*; Sakuma, Ichiro *(The University of Tokyo)*; Asano,
Takehide *(Clinical Research Center, National Hospital
Organization Chiba-E)*

**ThDT16-06:** 16:10-17:10　　　　　　　　　Rushmer Room
**Modeling and Simulation in Musculoskeletal
Biomechanics** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-06.1
**Simulated Laparoscopic Training and Measurement Systems
based on a Low-Cost sEMG and IMU Armband**
　Bolingot, Harold Jay\* *(Ateneo Innovation Center)*; Abrajano,
Gemalyn *(Ateneo Innovation Center)*; Libatique, Nathaniel
Joseph *(Ateneo Innovation Center)*; Salvaña, Mary Lai *(Ateneo
Innovation Center)*; Tangonan, Gregory *(Ateneo Innovation
Center)*; Reyes, Deogracias Alberto *(Center for Advanced
Skills, Simulation, and Training Innovation,)*; Ngeo, Jimson
*(Nara Institute of Science and Technology)*; Shibata, Tomohiro
*(Kyushu Institute of Technology)*

**ThDT16-07:** 16:10-17:10　　　　　　　　　Rushmer Room
**Multiscale Biomechanics** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-07.1
**Live-Cell Rheometry for Characterizing Medical Conditions**
　Pokki, Juho\* *(Stanford University)*; Nabar, Namita *(Stanford
University)*; Franklin, J. Matthew *(Stanford University)*; Merola,
Maria Consiglia *(Stanford University)*; Fuller, Gerald G.
*(Stanford University)*

**ThDT16-08:** 16:10-17:10　　　　　　　　　Rushmer Room
**New Technologies and Methodologies in Biomechanics** (Poster
Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-08.1
**Gray Anodization of Titanium Alloys in Alkaline Electrolyte**
　Lee, Suwon *(OSONG Medical Innovation Foundation)*;
Jung, Tae-Gon *(OSONG Medical Innovation Foundation)*;
Yang, Jae-Woong *(OSONG Medical Innovation Foundation)*;
Jeong, Jae-Young *(OSONG Medical Innovation Foundation)*;
Park, Kwang-Min *(OSONG Medical Innovation Foundation)*;
Jeong, Yong-Hoon\* *(OSONG Medical Innovation Foundation)*

16:12-16:14　　　　　　　　　　　　　ThDT16-08.2
**Comparison Study of Elasticity of Swine Liver
in Vivo and in Vitro**
　Kim, Daeyoung *(Teikyo Heisei University)*; Kobayashi, Etsuko\*
*(The University of Tokyo)*; Sato, Ryutaro *(Teikyo Heisei
University)*; Kiguchi, Kazuo *(Kyushu University)*; Sakuma, Ichiro
*(The University of Tokyo)*

16:14-16:16　　　　　　　　　　　　　ThDT16-08.3
**Recognition of Turn during Normal Walking using FSRs**
　Lee, Chang Min *(Korea Institute of Science and Tech.)*; Park, Ji
Su *(Korea Institute of Science and Tech.)*; Park, Shinsuk *(Dept.
of Mechanical Engineering, Korea University)*; Kim, Choong
Hyun\* *(Korea Institute of Science and Tech.)*

**ThDT16-09:** 16:10-17:10　　　　　　　　　Rushmer Room
**New Technologies and Methodologies in Human
Movement Analysis** (Poster Session)

16:10-16:12　　　　　　　　　　　　　ThDT16-09.1
**Robot-Assistance in Understanding and Education of Tooth
Removal: Setup and Preliminary Results**
　van Riet, Tom Cornelis Theodorus\* *(Academic Medical Center,
University of Amsterdam)*; Kober, Jens *(Delft University of
Technology)*; Zhang, Xiang *(University of Innsbruck)*; Griffioen,
Maarten *(TU Delft)*; van Twisk, Piethein *(Erasmusmc)*; de
Lange, Jan *(Academic Medical Center, University of
Amsterdam)*; Babuska, Robert *(University of Technology, Delft)*

16:12-16:14　　　　　　　　　　　　　ThDT16-09.2
**Standing Balance Evaluation of the Elderly by
Kinect and Wii Balance Board**
　Kim, Tae Ho *(Konkuk University)*; Cho, Haemi *(Kokkuk Univ.)*;
Tack, Gye-Rae\* *(Konkuk University)*

**ThDT16-10:** 16:10-17:10      Rushmer Room
**New Technologies and Methodologies in Milli, Micro and Nanorobots** (Poster Session)

16:10-16:12      ThDT16-10.1
**Electromagnetic Actuated Microrobot Control using Time Delay Estimation with Anti-Windup Scheme**
Kim, Junyoung* *(Daegu Gyeongbuk Institute of Science and Tech. (DGIST))*; Choi, Hongsoo *(DGIST)*; Kim, Jonghyun *(Daegu Gyeongbuk Institute of Science and Tech. (DGIST))*

**ThDT17-01:** 16:10-17:10      Einthoven Hall
**Acoustic Signal Analysis I** (Poster Session)

16:10-16:12      ThDT17-01.1
**Remote Monitoring, Distress Detection by Slightest Invasive Systems: Sound Recognition based on Hierarchical I-Vectors**
ROBIN, Maxime* *(UTC, KRG Corporate)*; Istrate, Dan *(UTC)*; Boudy, Jerome *(IT-Sudparis)*

16:12-16:14      ThDT17-01.2
**An Anchored Dynamic Time-Warping for Alignment and Comparison of Swallowing Acoustic Signals**
Rosa, Marcelo* *(Universidade Tecnológica Federal do Paraná)*; Fugmann, Elmar Allen *(Universidade Federal do Paraná)*; Santana, Gisele *(Ufpr Hc)*; Nunes, Maria Cristina de Alencar *(Federal University of Parana - UFPR)*

16:14-16:16      ThDT17-01.3
**Analysis of Phonocardiogram Signals through Proactive Denoising using Novel Self-Discriminant Learner**
Puri, Chetanya* *(Research and Innovation, Tata Consultancy Services, India)*; Singh, Rituraj *(TATA Consultancy Services)*; Bandyopadhyay, Soma *(TATA Consultancy Services)*; Ukil, Arijit *(TATA Consultancy Services)*; Mukherjee, Ayan *(Tata Consultancy Services)*

16:16-16:18      ThDT17-01.4
**A Multichannel Acoustic Approach to Define a Pulmonary Pathology as Combined Pulmonary Fibrosis and Emphysema Syndrome**
Santiago-Fuentes, Laura Mercedes *(Univ. Autónoma Metropolitana)*; Charleston-Villalobos, Sonia* *(Univ. Autonoma Metropolitana)*; Gonzalez-Camarena, Ramon *(Univ. Autonoma Metropolitana)*; Mejía Ávila, Mayra *(Instituto Nacional de Enfermedades Respiratorias)*; Mateos-Toledo, Heidegger *(National Institute of Respiratory Diseases)*; Buendia-Roldan, Ivette *(National Institute of Respiratory Diseases)*; Aljama-Corrales, Tomas *(Univ. Autonoma Metropolitana)*

16:18-16:20      ThDT17-01.5
**Detection of Explosive Cough Events in Audio Recordings by Internal Sound Analysis**
Rocha, Bruno *(Univ. of Coimbra)*; Mendes, Luis *(Univ. of Coimbra)*; Couceiro, Ricardo *(Univ. of Coimbra)*; Henriques, Jorge* *(Univ. of Coimbra)*; de Carvalho, Paulo *(Univ. of Coimbra)*; Paiva, Rui Pedro *(Univ. of Coimbra)*

**ThDT17-02:** 16:10-17:10      Einthoven Hall
**Physiological Systems Modeling II** (Poster Session)

16:10-16:12      ThDT17-02.1
**Kernel-Based Adaptive Learning Improves Accuracy of Glucose Predictive Modelling in Type 1 Diabetes: A Proof-of-Concept Study**
Georga, Eleni I. *(Univ. of Ioannina)*; Principe, Jose *(Univ. of Florida)*; Rizos, Evangelos C. *(Dept. of Internal Medicine, Univ. Hospital of Ioannina)*; Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

16:12-16:14      ThDT17-02.2
**Suppression of Ventilation Artifacts for Gastrointestinal Slow Wave Recordings**
Paskaranandavadivel, Niranchan* *(The Univ. of Auckland)*; Alighaleh, Saeed *(Auckland Bioengineering Institute, Univ. of Auckland)*; Du, Peng *(The Univ. of Auckland)*; O'Grady, Gregory *(Univ. of Auckland)*; Cheng, Leo K *(The Univ. of Auckland)*

16:14-16:16      ThDT17-02.3
**An Adaptive Prediction Method for Signal Fusion**
Holland, Alex* *(Edwards LifeSciences)*; Asgari, Shadnaz *(California State University, Long Beach)*

16:16-16:18      ThDT17-02.4
**Establishing and Validating a New Source Analysis Method using Phase**
Chirumamilla, Venkata Chaitanya* *(Johannes Gutenberg University, Dept. of Neurology Mainz)*; Gonzalez-Escamilla, Gabriel *(Johannes Gutenberg University)*; Kumar, Saurabh *(Max Planck Institute for Human Cognitive and Brain Sciences, Lei)*; Longfei, Xiong *(Christian Albrechts University Kiel)*; Groppa, Sergiu *(Johannes Gutenberg University)*; Muthuraman, Muthuraman *(Johannes Gutenberg University)*

16:18-16:20      ThDT17-02.5
**Evaluating the Effectiveness of Different External Cues on Non-Invasive Brain-Computer Interfaces**
Pearce, Sarah* *(Univ. of Waterloo)*; Boger, Jennifer *(Univ. of Waterloo)*; Mrachacz-Kersting, Natalie *(Aalborg Univ.)*; Farina, Dario *(Bernstein Center for Computational Neuroscience, Univ. Medic)*; Jiang, Ning *(Univ. of Waterloo)*

**ThDT17-03:** 16:10-17:10      Einthoven Hall
**Principal and Independent Component Analysis II** (Poster Session)

16:10-16:12      ThDT17-03.1
**Cortico-Muscular Coherence Enhancement via Coherent Wavelet Enhanced Independent Component Analysis**
Xu, Yuhang* *(King's College London)*; McClelland, Verity M. *(King's College London)*; Cvetkovic, Zoran *(King's College London)*; Mills, Kerry R. *(King's College London)*

16:12-16:14      ThDT17-03.2
**Reliable Gradient Search Directions for Kurtosis-Based Deflationary ICA: Application to Physiological Signal Processing**
Saleh, Majd *(Univ. de Rennes 1)*; Karfoul, Ahmad* *(Univ. de Rennes1)*; Kachenoura, Amar *(Univ. de Rennes1 and INSERM)*; Senhadji, Lotfi *(Univ. de Rennes 1 and INSERM)*; Albera, Laurent *(Univ. de Rennes 1 and INSERM)*

16:14-16:16      ThDT17-03.3
**Real-Time Fetal ECG Extraction from Multichannel Abdominal ECG using Compressive Sensing and ICA**
Gurve, Dharmendra* *(Ryerson University)*; Pant, Jeevan Kumar *(Ryerson University)*; Krishnan, Sridhar *(Ryerson University)*

16:16-16:18      ThDT17-03.4
**A Reliable Brain-Computer Interface based on SSVEP using Online Recursive Independent Component Analysis**
Chen, Chiu-Kuo* *(National Chiao Tung University (NCTU); Bureau of Standards, Metrolog)*; Fang, Wai-Chi *(National Chiao Tung University)*

**ThDT17-04:** 16:10-17:10      Einthoven Hall
**Signal Processing in Physiological Systems – Epilepsy I** (Poster Session)

16:10-16:12      ThDT17-04.1
**Linear Time-Varying Model Characterizes Invasive EEG Signals Generated from Complex Epileptic Networks**
Li, Adam* *(Neuromedical Control Systems Lab)*; Gunnarsdottir, Kristin *(Johns Hopkins Univ.)*; Inati, Sara *(Natl. Inst. of Health)*; Zaghloul, Kareem *(Natl. Inst. of Health)*; Gale, John *(Cleveland Clinic)*; Bulacio, Juan *(Cleveland Clinic)*; Gonzalez-Martinez, J. *(Cleveland Clinic)*; Sarma, S.V. *(Johns Hopkins Univ.)*

16:12-16:14      ThDT17-04.2
**Functional Clustering Approach for the Analysis of Stereo-EEG Activity Patterns in Correspondence of Epileptic Seizures**
Coelli, Stefania* *(Dept. of Electronics, Information and Bioengineering)*; Maggioni, Eleonora *(Scientific Institute IRCCS E.Medea)*; Cerutti, Sergio *(Politecnico di Milano)*; Nobili, Lino *(Center for Sleep Medicine at Niguarda Ca' Granda Hospital, Milan)*; Rubino, Annalisa *(Centre for Epilepsy Surgery, Niguarda Hospital, Milan, Italy)*; Campana, Chiara *(Centre for Epilepsy Surgery, Niguarda Hospital, Milan, Italy)*; Bianchi, Anna Maria *(Politecnico di Milano)*

**16:14-16:16**            ThDT17-04.3

**Improved Neonatal Seizure Detection using Adaptive Learning**

Ansari, Amir Hossein* *(KU Leuven)*; Cherian, Perumpillichira Joseph *(Clinical Neurophysiology, Dept. of Neurology, ErasmusMC, Rot)*; Caicedo Dorado, Alexander *(KU Leuven)*; De Vos, Maarten *(Univ. of Oxford)*; Naulaers, Gunnar *(Univ. Hospitals Leuven)*; Van Huffel, Sabine *(KU Leuven)*

**16:16-16:18**            ThDT17-04.4

**Epileptic Seizure Detection based on Expected Activity Measurement and Neural Network Classification**

Dhif, Imen* *(UPMC-LIP6)*; Hachicha, Khalil *(UPMC)*; Pinna, Andrea *(LIP6 UMR 7606, Université Pierre et Marie Curie, CNRS, Paris)*; Hochberg, Sylvain *(CIRA)*; Mhedhbi, Imen *(UPMC)*; Garda, Patrick *(UPMC)*

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**ThDT17-05:** 16:10-17:10            Einthoven Hall
**Signal Processing in Physiological Systems –
Sleep I** (Poster Session)

**16:10-16:12**            ThDT17-05.1

**Respiration Estimation and Apnea Detection using Fuzzy Logic**

Mudvari, Akrit* *(Trinity College)*; Ning, Taikang *(Trinity College)*

**16:12-16:14**            ThDT17-05.2

**Automatic Picking of Snore Events from
Overnight Breath Sound Recordings**

Swarnkar, Vinayak *(University of Queensland)*; Abeyratne, Udantha R *(University of Queensland)*; Sharan, Roneel V* *(University of Queensland)*

**16:14-16:16**            ThDT17-05.3

**Characterizing the NREM/REM Sleep Specific Obstructive Sleep Apnea Severity using Snore Sounds**

Akhter, Shahin* *(Univ. of Queensland)*; Abeyratne, Udantha R *(Univ. of Queensland)*; Swarnkar, Vinayak *(Univ. of Queensland)*

**16:16-16:18**            ThDT17-05.4

**Blood Pressure and Cardiovascular Parameters during Sleep Arousals**

Salari Shahrbabaki, Sobhan* *(RMIT University)*; Ahmed, Beena *(Texas A&M University at Qatar)*; Penzel, Thomas *(Charite Universitätsmedizin Berlin)*; Cvetkovic, Dean *(RMIT University)*

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**ThDT17-06:** 16:10-17:10            Einthoven Hall
**Signal Processing in Wearable Technology I** (Poster Session)

**16:10-16:12**            ThDT17-06.1

**Serial Fusion of Eulerian and Lagrangian Approaches for Accurate Heart-Rate Estimation using Face Videos**

Puneet, Gupta* *(Tata Consultancy Services Ltd.)*; Bhowmick, Brojeshwar *(Innovation Labs, Tata Consultancy Services Ltd.)*; Pal, Arpan *(Tata Consultancy Services)*

**16:12-16:14**            ThDT17-06.2

**A Simple Non-Contact Vital Sensing Method using Doppler Sensors Applicable to Multiple Targets**

Kamiya, Yukihiro* *(Aichi Prefectural University)*

**16:14-16:16**            ThDT17-06.3

**Automated Analysis of in Meal Eating Behavior using a Commercial Wristband IMU Sensor**

Kyritsis, Konstantinos *(Aristotle University of Thessaloniki)*; Tatli, Christina *(Imperial College Business School)*; Diou, Christos* *(Aristotle University of Thessaloniki)*; Delopoulos, Anastasios *(Aristotle University of Thessaloniki)*

**16:16-16:18**            ThDT17-06.4

**Non-Contact Acquisition of Respiration and Heart Rates using Doppler Radar with Time Domain Peak-Detection Algorithm**

Yang, Xiaofeng* *(The University of Electro-Communications)*; Sun, Guanghao *(The University of Electro-Communications)*; Ishibashi, Koichiro *(The University of Electro-Communications)*

**16:18-16:20**            ThDT17-06.5

**Effect of Motion Artifact on Digital Camera based Heart Rate Measurement**

Mohamed Ameen Mashood, Mohamed Abul Hassan* *(UTP)*; Malik, Aamir Saeed *(Universiti Teknologi PETRONAS)*; Fofi, David *(Univ. Bourgogne Franche-Com)*; Saad, Naufal *(Universiti Teknologi PETRONAS)*; Meriaudeau, Fabrice *(Universite de Bourgogne)*

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**ThDT18-01:** 16:10-17:10            Montgomery Hall
**Neural Networks and Support Vector Machines II** (Poster Session)

**16:10-16:12**            ThDT18-01.1

**Classifying Hard and Soft Bone Tissues using Drilling Sounds**

Zakeri, Vahid* *(University of British Columbia)*; Hodgson, Antony J. *(University of British Columbia)*

**16:12-16:14**            ThDT18-01.2

**Predictive Local Receptive Fields based Respiratory Motion Tracking for Motion-Adaptive Radiotherapy**

Wang, Yubo *(Xidian Univ.)*; Tatinati, Sivanagaraja* *(Nanyang Tech. Univ.)*; Huang, Liyu *(Xidian Univ.)*; Kim, Jeong Hong *(Kyungpook National Univ.)*; Shafiq, Ghufran *(Kyungpook National Univ.)*; Veluvolu, Kalyana C. *(Kyungpook National Univ.)*; Khong, Andy W H *(Nanyang Tech. Univ.)*

**16:14-16:16**            ThDT18-01.3

**Motor Imagery EEG Classification with Optimal Subset of Wavelet based Common Spatial Pattern and Kernel Extreme Learning Machine**

Park, Hyeong-jun* *(Gwangju Institute of Science and Tech.)*; Kim, Jongin *(Gwangju Institute of Science and Tech.)*; BeomJun, Min *(Gwangju Institute of Science and Tech. (GIST))*; Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

**16:16-16:18**            ThDT18-01.4

**Freezing-of-Gait Detection using Temporal, Spatial, and Physiological Features with a Support-Vector-Machine Classifier**

Tahafchi, Parisa* *(Univ. of Florida)*; Molina, Rene *(Univ. of Florida)*; Roper, Jaimie *(Univ. of Florida)*; Sowalsky, Kristen *(Univ. of Florida)*; Hass, Chris *(Univ. of Florida)*; Gunduz, Aysegul *(Univ. of Florida)*; Okun, Michael *(Univ. of Florida)*; Judy, Jack *(Univ. of Florida)*

**16:18-16:20**            ThDT18-01.5

**Recognition Physical Activities with Optimal Number of Wearable Sensors using Data Mining Algorithms and Deep Belief Network**

Al-fatlawi, Ali H. *(Univ. of Kufa)*; Fatlawi, Hayder K. *(Univ. of Kufa)*; Ling, Steve* *(Univ. of Technology Sydney)*

**16:20-16:22**            ThDT18-01.6

**PCA-MLP SVM Distinction of Salivary Raman Spectra of Dengue Fever Infection**

Mohd Radzol, Afaf Rozan *(Universiti Teknologi MARA)*; Lee, Khuan Y.* *(Universiti Teknologi MARA)*; Mansor, Wahidah *(Universiti Teknologi MARA)*; Wong, Peng Shyan *(Infectious Disease Unit, Pulau Pinang General Hospital)*; Looi, Irene *(Head of Dept., Consultant Neurologist, Hospital Seberang Ja)*

**16:22-16:24**            ThDT18-01.7

**Classification of Familiarity based on Cross-Correlation Features between EEG and Music**

Kumagai, Yuiko* *(Tokyo Univ. of Agriculture and Technology)*; Arvaneh, Mahnaz *(Univ. of Sheffield)*; Okawa, Haruki *(Tokyo Univ. of Agriculture and Technology)*; Wada, Tomoya *(Tokyo Univ. of Agriculture and Technology)*; Tanaka, Toshihisa *(Tokyo Univ. of Agriculture and Technology)*

**16:24-16:26**            ThDT18-01.8

**Assessment of Support Vector Machines and Convolutional Neural Networks to Detect Snoring using Emfit Mattress**

Perez-Macias, Jose Maria* *(Tampere University of Technology)*; Adavanne, Sharath *(Tampere University of Technology)*; Viik, Jari *(Tampere University of Technology)*; Värri, Alpo *(Tampere University of Technology)*; Himanen, Sari-Leena *(Irkanmaa Hospital District)*; Tenhunen, Mirja *(Dept. of Clinical Neurophysiology, Pirkanmaa Hospital)*

**16:26-16:28**            ThDT18-01.9
**Using LSTMs to Learn Physiological Models of Blood Glucose Behavior**
Mirshekarian, Sadegh *(Ohio Univ.)*; Bunescu, Razvan* *(Ohio Univ.)*; Marling, Cindy *(Ohio Univ.)*; Schwartz, Frank *(Ohio Univ.)*

**16:28-16:30**            ThDT18-01.10
**Convolutional Neural Network Classifier for Distinguishing Barrett's Esophagus and Neoplasia Endomicroscopy Images**
Hong, Jisu *(Sungkyunkwan Univ.)*; Park, Bo-yong *(Sungkyunkwan Univ.)*; Park, Hyunjin* *(Sungkyunkwan Univ.)*

**16:30-16:32**            ThDT18-01.11
**A Deep Learning Approach to Adherence Detection for Type 2 Diabetics**
Mohebbi, Ali* *(Technical Univ. of Denmark)*; Aradóttir, Tinna Björk *(Technical Univ. of Denmark)*; Johansen, Alexander Rosenberg *(Technical Univ. of Denmark)*; Bengtsson, Henrik *(Novo Nordisk A/S)*; Fraccaro, Marco *(Technical Univ. of Denmark)*; Morup, Morten *(DTU Compute)*

**16:32-16:34**            ThDT18-01.12
**Character Recognition from Trajectory by Recurrent Spiking Neural Networks**
Shen, Jiangrong *(Zhejiang Univ.)*; Wang, Yueming* *(Zhejiang Univ.)*; Lin, Kang *(Zhejiang Univ.)*; Pan, Gang *(ZheJiang Univ.)*

**16:34-16:36**            ThDT18-01.13
**Three Drowsiness Categories Assessment by Electroencephalogram in Driving Simulator Environment**
Akbar, Izzat Aulia* *(Kumamoto University)*; Rumagit, Arthur Mourits *(Kumamoto University)*; Utsunomiya, Mitaku *(Kumamoto University)*; Morie, Takamasa *(Kumamoto University)*; Igasaki, Tomohiko *(Kumamoto University)*

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**ThDT18-02:**   16:10-17:10         Montgomery Hall
**Time-Frequency and Time-Scale Analysis I** (Poster Session)

**16:10-16:12**            ThDT18-02.1
**Objective Assessment of Perceived Effort in Listening by Employing EEG Features**
Mortezapouraghdam, Zeinab* *(Saarland University)*; Strauss, Daniel J. *(Saarland University, Medical Faculty)*; Bernarding, Corinna *(Saarland University Hospital)*

**16:12-16:14**            ThDT18-02.2
**Measurement of Human Enamel Mechanical Characteristics with Resonant Ultrasound Spectroscopy**
Feng, Dandan *(Beihang University)*; Fan, Fan *(Beihang University)*; Wang, Rui *(Beihang University)*; Zhang, Qiang *(Beihang University)*; Niu, Haijun* *(Beihang University)*

**16:14-16:16**            ThDT18-02.3
**Estimation of Pulse Rate from Ambulatory PPG using Ensemble Empirical Mode Decomposition and Adaptive Thresholding**
Pittara, Melpo* *(University of Cyprus)*; Theocharides, Theocharis *(University of Cyprus)*; Orphanidou, Christina *(University of Cyprus)*

**16:16-16:18**            ThDT18-02.4
**Non-Invasive Diagnosis of Non-Alcoholic Fatty Liver Disease (NAFLD) using Ultrasound Image Echogenicity**
Benjamin, Alex *(MIT)*; Zubajlo, Rebecca *(MIT)*; Thomenius, Kai Erik *(MIT)*; Dhyani, Manish *(Massachusetts General Hospital)*; Kaliannan, Kanakaraju *(Massachusetts General Hospital - Harvard University)*; Samir, Anthony Edward *(Harvard Medical School, Massachusetts General Hospital)*; Anthony, Brian W.* *(Massachusetts Institute of Tech.)*

**16:18-16:20**            ThDT18-02.5
**Comparison of Electrohysterogram Characteristics during Uterine Contraction and Non-Contraction during Labor**
Liu, Zhihui *(Beijing Univ. of Tech.)*; Hao, Dongmei* *(Beijing Univ. of Tech.)*; Zhang, Lei *(Beijing Univ. of Tech.)*; Liu, Juntao *(Peking Union Medical College Hospital)*; Zhou, Xiya *(Peking Union Medical College Hospital)*; Yang, Lin *(Beijing Univ. of Tech.)*; Yang, Yimin *(Beijing Univ. of Tech.)*; Li, Xuwen *(Beijing Univ. of Tech.)*; Zhang, Song *(Beijing Univ. of Tech.)*; Zheng, Dingchang *(Anglia Ruskin Univ.)*

**16:20-16:22**            ThDT18-02.6
**Performance Comparison of Wavelet based Denoising Methods on Discontinuous Adventitious Lung Sounds**
Ulukaya, Sezer* *(Bogazici University / Trakya University)*; Serbes, Gorkem *(Yildiz Technical University)*; Kahya, Yasemin P. *(Bogazici University)*

**16:22-16:24**            ThDT18-02.7
**Analysis of Dynamic Antral Scintigraphy using Empirical Mode Decomposition**
Ngamsirijit, Panasun *(Faculty of Engineering, Chulalongkorn University)*; Jarumaneeroj, Pisit *(Chulalongkorn University)*; Chaiwatanarat, Tawatchai *(Faculty of Medicine, Chulalongkorn University)*; Rakvongthai, Yothin* *(Faculty of Medicine, Chulalongkorn University)*

**16:24-16:26**            ThDT18-02.8
**Feature Reconstruction of LFP Signals based on PLSR in the Neural Information Decoding Study**
Dong, Yonghui* *(Zhengzhou University)*; Shang, Zhigang *(Zhengzhou University)*; Li, Mengmeng *(Zhengzhou University)*; Liu, Xinyu *(Zhengzhou University)*; Wan, Hong *(Zhengzhou University)*

**16:26-16:28**            ThDT18-02.9
**Gender Differences in Dynamic Functional Connectivity based on Resting-State fMRI**
Mao, Nini *(Beijing Normal University)*; Zheng, Hongna *(Beijing Normal University)*; Long, Zhiying *(Beijing Normal University)*; Li, Yao *(College of Information Science and Technology, Beijing Normal Un)*; Xia, Wu* *(Beijing Normal University,)*

**16:28-16:30**            ThDT18-02.10
**Physical Activity Classification using Time-Frequency Signatures of Motion Artifacts in Multi-Channel Electrical Impedance Plethysmographs**
Khan, Hassan Aqeel* *(National University of Sciences & Technology)*; Gore, Amit *(GE Global Research)*; Ashe, Jeffrey *(GE Global Research)*; Chakrabartty, Shantanu *(Washington University in Saint Louis Missouri)*

**16:32-16:34**            ThDT18-02.12
**Variation-Based Sparse Source Imaging in Localizing Uterine Activity**
Zahran, Saeed* *(Université de technologie de Compiègne)*; Yochum, Maxime *(Université de Rennes 1)*; Diab, Ahmad *(Universite de technologie de Compiegne - UTC)*; Khalil, Mohamad *(Lebanese University, Doctoral Doctoral School for Sciences and Technology,)*; Marque, Catherine *(University of technology of compiegne)*

**16:34-16:36**            ThDT18-02.13
**Respiratory Sounds Classification using Statistical Biomarker**
Mondal, Ashok *(Dept. of Electronics and Communication Engineering)*; Tang, Hong* *(Dept. of Biomedical Engineering, Dalian University of Tech)*

**16:36-16:38**            ThDT18-02.14
**Significance of Modified Empirical Mode Decomposition for ECG Denoising**
Singh, Pratik* *(NIT Patna)*; Shahnawazuddin, S *(NIT Patna)*; Pradhan, Gayadhar *(NIT Patna)*

**FrAT1:** 08:00-09:30      Roentgen Hall
**Signal Pattern Classification – Brain
Computer Interface** (Oral Session)
**Chair:** Guan, Cuntai *(Nanyang Technological University)*

08:00-08:15      FrAT1.1
**Evaluation of Filtering Techniques to Extract Movement
Intention Information from Low-Frequency EEG Activity**
Bibián, Carlos *(Univ. Tübingen)*; López-Larraz, Eduardo* *(Univ.
of Tübingen)*; Irastorza-Landa, Nerea *(Univ. of Tübingen)*;
Birbaumer, Niels *(Eberhard-Karls-Univ.)*; Ramos-Murguialday,
Ander *(Eberhard Karls Univ. of Tubingen/TECNALIA)*

08:15-08:30      FrAT1.2
**Reject Option to Improve Decoding Accuracy for
EEG-Motor Imagery based BCI**
M, Ganeshkumar *(National Univ. of Singapore (NUS))*; So, Rosa*
*(Institute for Infocomm Research)*; Ang, Kai Keng *(Institute for
Infocomm Research)*; Guan, Cuntai *(Nanyang Technological Univ.)*

08:30-08:45      FrAT1.3
**Decoding Complex Imagery Hand Gestures**
Mohseni Salehi, Seyed Sadegh* *(Northeastern University)*;
Moghadamfalahi, Mohammad *(Northeastern University)*;
Quivira, Fernando *(Northeastern University)*; Piers, Alexander
*(Northeastern University)*; Nezamfar, Hooman *(Northeastern
University)*; Erdogmus, Deniz *(Northeastern University)*

08:45-09:00      FrAT1.4
**Context-Aware Recursive Bayesian Graph Traversal in BCIs**
Mohseni Salehi, Seyed Sadegh* *(Northeastern Univ.)*;
Moghadamfalahi, Mohammad *(Northeastern Univ.)*; Nezamfar,
Hooman *(Northeastern Univ.)*; Haghighi, Marzieh *(Northeastern
Univ.)*; Erdogmus, Deniz *(Northeastern Univ.)*

09:00-09:15      FrAT1.5
**Motor Imagery Classification of Upper Limb Movements
based on Spectral Domain Features of EEG Patterns**
Samuel, Oluwarotimi Williams *(Shenzhen Institutes of
Advanced Tech.)*; Li, Xiangxin *(Shenzhen Institutes of
Advanced Tech., Chinese Academy of Sc)*; Geng, Yanjuan
*(Shenzhen Institutes of Advanced Tech.)*; Fang, Peng
*(Shenzhen Institutes of Advanced Tech., Chinese Academy of
S)*; Chen, Shixiong *(Shenzhen Institutes of Advanced Tech.)*; Li,
Guanglin* *(Shenzhen Institutes of Advanced Tech.)*

09:15-09:30      FrAT1.6
**A Robust Beamforming Approach for Early Detection
of Readiness Potential with Application to
Brain-Computer Interface Systems**
Mahmoodi, Maryam *(Tehran Tech. of Medical Sciences)*; Makki
Abadi, Bahador* *(Tehran Tech. of Medical Sciences)*; Khajehpour,
Hassan *(Tehran Tech. of Medical Sciences)*; Harirchian,
Mohammad Hosein *(Medical Sciences/Univ. of Tehran)*

**FrAT2:** 08:00-09:30      Cho Room
**Ultrasound Imaging – Elastography I** (Oral Session)
**Chair:** Managuli, Ravi *(Hitachi Aloka Medical America, Inc.)*
**Co-Chair:** Yoo, Yangmo *(Sogang University)*

08:00-08:15      FrAT2.1
**ARFI Variance of Acceleration (VoA) for Noninvasive
Characterization of Human Carotid Plaques in Vivo**
Torres, Gabriela* *(Univ. of North Carolina, Chapel Hill and North
Carolina S)*; Czernuszewicz, Tomasz *(Univ. of North Carolina,
Chapel Hill)*; Homeister, Jonathon *(Univ. of North Carolina, Chapel
Hill)*; Farber, Mark *(Univ. of North Carolina, Chapel Hill)*; Gallippi,
Caterina *(The Univ. of North Carolina, Chapel Hill)*

08:15-08:30      FrAT2.2
**The Influence of Hepatic Steatosis on the Evaluation of
Fibrosis with Non-Alcoholic Fatty Liver Disease by
Acoustic Radiation Force Impulse**
Guo, Yanrong *(Shenzhen Univ.)*; Lin, Haoming *(Shenzhen
Univ.)*; Zhang, Xin-Yu *(Shenzhen Univ.)*; Wen, H. *(Shenzhen
Univ.)*; Chen, S. *(Shenzhen Univ.)*; Chen, X.* *(Shenzhen Univ.)*

08:30-08:45      FrAT2.3
**Application of Compressive Sensing to Portable
Ultrasound Elastography**
Shin, Bonghun Shin *(University of Waterloo)*; Jeon, Soo
*(University of Waterloo)*; Ryu, Jeongwon *(Healcerion Inc.)*;
Kwon, Hyock Ju* *(University of Waterloo)*

08:45-09:00      FrAT2.4
**Radiofrequency Ultrasound Data Acquisition with a 640-
Element Array Transducer for Strain Imaging: Experimental
Results with Phantoms and Biological Tissue Samples**
Brusseau, Elisabeth* *(CREATIS)*; Bernard, Adeline *(CREATIS)*;
Meynier, Cyril *(VERMON)*; Ferin, Guillaume *(VERMON)*;
Nguyen-Dinh, An *(VERMON)*; Basset, Olivier *(CREATIS)*

09:00-09:15      FrAT2.5
**Measurement of Surface Acoustic Waves in High-Frequency
Ultrasound: Preliminary Results**
Saavedra, Ana Cecilia* *(Pontificia Universidad Católica del
Perú)*; Zvietcovich, Fernando *(University of Rochester)*;
Lavarello, Roberto *(Pontificia Universidad Catolica del Peru)*;
Castañeda, Benjamín *(Pontificia Universidad Católica del Perú)*

09:15-09:30      FrAT2.6
**Shear Wave Estimation by using Shear Wave Holography
with Normal Vibration: Preliminary Results**
Arroyo, Junior* *(Pontificia Universidad Católica del Perú)*;
Castañeda, Benjamín *(Pontificia Universidad Católica del Perú)*

**FrAT3:** 08:00-09:30      Park Room
**MRI Neuroimaging** (Oral Session)
**Chair:** Wang, Yi *(Cornell University)*
**Co-Chair:** Wang, Ze *(Temple University)*

08:00-08:15      FrAT3.1
**Central Sulcus Depth and Sulcal Profile Differences between
Congenitally Blind and Sighted Individuals**
James, Clarissa* *(Univ. of Southern California)*; Lepore, Franco
*(Univ. of Montreal)*; Collignon, Olivier *(Univ. Catholique de
Louvain)*; Lepore, Natasha *(Univ. of Southern California/Children's
Hospital Los Ange)*; Coulon, Olivier *(Aix-Marseille Univ.)*

08:15-08:30      FrAT3.2
**MRI based Objective Ischemic Core-Penumbra
Quantification in Adult Clinical Stroke**
Vupputuri, Anusha* *(Indian Institute of Technology Kharagpur)*;
Ashwal, Stephen *(Dept. of Pediatrics, Loma Linda University)*;
Tsao, Bryan *(Dept. of Neurology, Loma Linda University)*;
Haddad, Elia *(Dept. of Neurology, Loma Linda University)*;
Ghosh, Nirmalya *(Indian Institute of Technology Kharagpur)*

08:30-08:45      FrAT3.3
**Brain Functional Connectivity Alterations in a Rat Model of
Excessive Alcohol Drinking: A Resting-State Network Analysis**
Pérez-Ramírez, Úrsula *(Universitat Politècnica de València)*;
Díaz-Parra, Antonio *(Universitat Politècnica de València)*;
Ciccocioppo, Roberto *(School of Pharmacy University of
Camerino, Camerino, Italy)*; Canals, Santiago *(Instituto de
Neurociencias, Consejo Superior de Investigaciones)*; Moratal,
David* *(Universitat Politècnica de València)*

08:45-09:00      FrAT3.4
**Difference of Alzheimer's Disease Sub-Groups using Two
Features from Intensity Size Zone Matrix**
Lee, Seunghak *(Sungkyunkwan Univ.)*;
Park, Hyunjin* *(Sungkyunkwan University)*

09:00-09:15      FrAT3.5
**Early Axonal Damage in Normal Appearing White Matter in
Multiple Sclerosis: Novel Insights from Multi-Shell Diffusion MRI**
De Santis, Silvia *(Univ. Miguel Hernandez de Elche)*; Granberg,
Tobias *(Karolinska Institutet)*; Ouellette, Russell *(Dept. of
Radiology, Athinoula A. Martinos Center for Biomed)*; Treaba,
Constantina *(Dept. of Radiology, Athinoula A. Martinos Center for
Biomed)*; Fan, Qiuyun *(Dept. of Radiology, Athinoula A. Martinos
Center for Biomed)*; Herranz, Elena *(Athinoula A. Martinos Center
for Biomedical Imaging)*; Mainero, Caterina *(Dept. of Radiology,
Athinoula A. Martinos Center for Biomed)*; Toschi, Nicola* *(Univ. of
Rome "Tor Vergata", Faculty of Medicine)*

**09:15-09:30**                                        FrAT3.6
**Brain Age Estimation from T1-Weighted Images using Effective Local Features**
Fujimoto, Ryuichi* *(Tohoku University)*; Ito, Koichi *(Tohoku University)*; Wu, Kai *(South China University of Technology)*; Sato, Kazunori *(Tohoku University)*; Taki, Yasuyuki *(Tohoku University)*; Fukuda, Hiroshi *(Tohoku Pharmaceutical University)*; Aoki, Takafumi *(Tohoku University)*

**FrAT4: 08:00-09:30**                                 Min Room
**Body Sensor Networks – Molecules, Radio, and Machine Learning – I** (Invited Session)
**Chair:** Balasingham, Ilangko *(Oslo University Hospital and Norwegian University of Science and Technology)*
**Co-Chair:** Anzai, Daisuke *(Nagoya Institute of Technology)*

**08:00-08:15**                                        FrAT4.1
**Experimental Evaluation of 30 MHz Band Implant Communication using Automatic Equalization Technique**
Nomura, Kohei* *(Nagoya Institute of Technology)*; Anzai, Daisuke *(Nagoya Institute of Technology)*; Wang, Jianqing *(Nagoya Institute of Technology)*

**08:15-08:30**                                        FrAT4.2
**Development and Experimental Evaluation on Implant UWB-MIMO Transmission**
Anzai, Daisuke* *(Nagoya Institute of Technology)*; Ohta, Masahiro *(Nagoya Institute of Technology)*; Shimizu, Yuto *(Naogya Institute of Technology)*; Balasingham, Ilangko *(Oslo University Hospital and Norwegian University of Science and)*; Wang, Jianqing *(Nagoya Institute of Technology)*

**08:30-08:45**                                        FrAT4.3
**Wideband Phantoms of Different Body Tissues for Heterogeneous Models in Body Area Networks**
Castelló-Palacios, Sergio *(Univ. Politècnica de Valencia)*; Garcia-Pardo, Concepcion *(Universidad Politecnica de Valencia)*; Fornes-Leal, Alejandro *(Univ. Politècnica de Valencia)*; Cardona, Narcis *(Univ. Politècnica de València)*; Vallés-Lluch, Ana* *(Univ. Politècnica de València)*

**08:45-09:00**                                        FrAT4.4
**A Wireless Capsule Endoscopy Steering Mechanism using Magnetic Field Platform**
Alsunaydih, Fahad Nasser* *(Monash Univ.)*; Redouté, Jean-Michel *(Monash Univ.)*; Yuce, Mehmet *(Monash Univ.)*

**09:00-09:15**                                        FrAT4.5
**A Swallowable Sensing Device Platform with Wireless Power Feeding and Chemical Reaction Actuator**
Nakamura, Ryota* *(Kobe University)*; Izumi, Shintaro *(Kobe University)*; Kawaguchi, Hiroshi *(Kobe University)*; Ohta, Hidetoshi *(Sapporo Orthopedics and Cardiovascular Hospital)*; Yoshimoto, Masahiko *(Kobe University)*

**FrAT5: 08:00-09:30**                                 Lee Room
**Opportunities and Challenges for Wearable Medical Devices** (Minisymposium)
**Chair:** Park, Sung-Min *(POSTECH)*
**Co-Chair:** Namkoong, Kak *(Samsung Advanced Institute of Technology, Samsung Electronics Co., Ltd.)*

**08:00-08:15**                                        FrAT5.1
**Investigating Acute Skin Barrier Disruption using Reflectance NIR Spectroscopy**
Shin, Eui Seok* *(Samsung Advanced Institute of Technology)*; Lee, June-Young *(Samsung Advanced Institute of Technology)*; Lee, Seung Jun *(Samsung Advanced Institute of Technology)*

**08:15-08:30**                                        FrAT5.2
**Wearable MINDS: Cuffless Blood Pressure Monitoring**
Zhang, Yuan-Ting* *(The Chinese University of Hong Kong)*; Ding, Xiao-Rong *(The Chinese University of Hong Kong)*; Yan, Bryan P. *(Prince of Wales Hospital, The Chinese University of Hong Kong)*; Liu, Jing *(The Chinese University of Hong Kong)*; Su, Peng *(The Chinese University of Hong Kong)*; Zhao, Ni *(The Chinese University of Hong Kong)*

**FrAT6: 08:00-09:30**                                 Zworykin Room
**Single Protein Sensors and Actuators** (Invited Session)
**Chair:** Lu, Zuhong *(Southeast University)*
**Co-Chair:** Chen, Antony *(Peking University, College of Engineering)*

**08:00-08:15**                                        FrAT6.1
**Single Molecule High-Throughput Detection Platform for DNA Sequencing and Protein Machinery**
He, Jiankui* *(South Univ. of Science and Technology of China)*

**08:15-08:30**                                        FrAT6.2
**Real-Time Monitored Enzyme Catalysis Reaction based on a Solid-State Nanopore**
Liu, Quanjun* *(Southeast Univ.)*; Tan, ShengWei *(Southeast Univ.)*

**08:30-08:45**                                        FrAT6.3
**Mechanical Allostery of I-Domain-Containing Leukocyte Integrins**
Mao, Debin *(Institute of Mechanics, Chinese Academy of Sciences)*; Zhang, Xiao *(Institute of Mechanics, Chinese Academy of Sciences)*; Lü, Shouqin* *(Institute of Mechanics, Chinese Academy of Sciences)*; Long, Mian *(Institute of Mechanics, Chinese Academy of Sciences)*

**08:45-09:00**                                        FrAT6.4
**Spatio-Temporal Fluctuations of Single Protein Machine Investigated by Liquid Cell Transmission Electron Microscopy**
Lu, Zuhong* *(Southeast Univ.)*; Wang, Zunliang *(Southeast Univ.)*; Ge, Qinyu *(Southeast Univ.)*; Tu, Jing *(Southeast Univ.)*

**09:00-09:15**                                        FrAT6.5
**The use of Photoactivated Localization Microscopy-Based Approaches to Decipher the Role of RNA in Retrovirus Assembly at Nanoscale Resolutions in Living Cells**
Chen, Antony* *(Peking University, College of Engineering,)*

**FrAT7: 08:00-09:30**                                 Herrick Room
**Neurological Disorders I** (Oral Session)
**Chair:** Nguyen, Hung T. *(University of Technology, Sydney)*

**08:00-08:15**                                        FrAT7.1
**Detection of Turning Freeze in Parkinson's Disease based on S-Transform Decomposition of EEG Signals**
Ly, Quynh Tran* *(Univ. of Tech. Sydney)*; Handojoseno, Aluysius Maria Ardi *(Univ. of Tech., Sydney)*; Gilat, Moran *(Parkinson's Disease Research Clinic, Brain and Mind Research Ins)*; Chai, Rifai *(Univ. of Tech., Sydney)*; Ehgoetz Martens, Kaylena *(Univ. of Sydney)*; Georgiades, Matthew *(Univ. of Sydney)*; Naik, Ganesh R *(Univ. of Tech. Sydney)*; Tran, Yvonne *(Univ. of Tech., Sydney)*; Lewis, Simon J.G. *(Parkinson's Disease Research Clinic, Brain and Mind Research Ins)*; Nguyen, Hung T. *(Univ. of Tech., Sydney)*

**08:15-08:30**                                        FrAT7.2
**Detection of Gait Initiation Failure in Parkinson's Disease based on Wavelet Transform and Support Vector Machine**
Ly, Quynh Tran* *(Univ. of Tech. Sydney)*; Handojoseno, Aluysius Maria Ardi *(Univ. of Tech., Sydney)*; Gilat, Moran *(Parkinson's Disease Research Clinic, Brain and Mind Research Ins)*; Chai, Rifai *(Univ. of Tech., Sydney)*; Ehgoetz Martens, Kaylena *(Univ. of Sydney)*; Georgiades, Matthew *(Univ. of Sydney)*; Naik, Ganesh R *(Univ. of Tech. Sydney)*; Tran, Yvonne *(Univ. of Tech., Sydney)*; Lewis, Simon J.G. *(Parkinson's Disease Research Clinic, Brain and Mind Research Ins)*; Nguyen, Hung T. *(Univ. of Tech., Sydney)*

**08:30-08:45**                                        FrAT7.3
**Posturography Stability Score Generation for Stroke Patient using Kinect: Fuzzy based Approach**
Mazumder, Oishee* *(Tata Consultancy Services)*; Chakravarty, Kingshuk *(Tata Consultancy Services Ltd.)*; Chatterjee, Debatri *(TCS Innovation Lab)*; Sinha, Aniruddha *(Tata Consultancy Services Ltd.)*; Das, Abhijit *(Institute of NeuroSciences Kolkata)*

**08:45-09:00**                                        FrAT7.4
**Automated Epileptiform Spike Detection via Affinity Propagation-Based Template Matching**
Thomas, John* *(Nanyang Technological University)*; Jing, Jin *(Nanyang Technological University)*; Dauwels, Justin *(NTU)*; Cash, Sydney *(Massachusetts General Hospital)*; Westover, Brandon *(Massachusetts General Hospital)*

**July 14 Friday**

**09:00-09:15**  FrAT7.5

**A New Infarction Detection Method based on Heart Rate Variability in Rat Middle Cerebral Artery Occlusion Model**

Kodama, Tomonobu *(The Jikei Univ. School of Medicine)*; Kamata, Keisuke *(Kyoto Univ.)*; Fujiwara, Koichi* *(Kyoto Univ.)*; Kano, Manabu *(Kyoto Univ.)*; Yamakawa, Toshitaka *(Kumamoto Univ.)*; Yuki, Ichiro *(The Jikei Univ. School of Medicine)*; Murayama, Yuichi *(Jikei Univ. School of Medicine)*

**09:15-09:30**  FrAT7.6

**Stroke Lesion Location Influences the Decoding of Movement Intention from EEG**

López-Larraz, Eduardo* *(Univ. of Tübingen)*; Ray, Andreas Markus *(Tuebingen Univ.)*; da Cruz Figueiredo, Thiago *(Univ. of Tübingen)*; Bibián, Carlos *(Univ. Tübingen)*; Birbaumer, Niels *(Eberhard-Karls-Univ.)*; Ramos-Murguialday, Ander *(Eberhard Karls Univ. of Tubingen/TECNALIA)*

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**FrAT8:**  08:00-09:30  Schwan Room

**Brain Image Analysis I** (Oral Session)

**Chair:** Hu, Qingmao *(Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)*

**Co-Chair:** Park, Hyunjin *(Sungkyunkwan University)*

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**08:00-08:15**  FrAT8.1

**Automated Subdural Hematoma Segmentation for Traumatic Brain Injured (TBI) Patients**

Farzaneh, Negar* *(University of Michigan)*; Soroushmehr, S.M.Reza *(University of Michigan, Ann Arbor)*; Williamson, Craig *(University of Michigan)*; Jiang, Cheng *(University of Michigan)*; Srinivasan, Ashok *(University of Michigan)*; Bapuraj, Jayapalli Rajiv *(University of Michigan)*; Ward, Kevin *(University of Michigan)*; Korley, Frederick K *(University of Michigan)*; Najarian, Kayvan *(University of Michigan - Ann Arbor)*

**08:15-08:30**  FrAT8.2

**Compartmental Sparse Feature Selection Method for Alzheimer's Disease Identification**

Liu, Yan *(University of Chinese Academy of Sciences)*; Wang, Ling* *(University of Electronic Science and Technology of China)*; Zeng, Xiangzhu *(Peking University Third Hospital, Beijing, China)*; Wang, Zheng *(Capital University of Medical Sciences)*; Gao, Yajun *(The General Hospital of Petroleum Administration of North China)*; Wang, Qiuyue *(The General Hospital of Petroleum Administration of North China)*

**08:30-08:45**  FrAT8.3

**Low Grade Glioma Growth Modeling Considering Chemotherapy and Radiotherapy Effects from Magnetic Resonance Images**

Elazab, Ahmed *(Shenzhen Institutes of Advanced Tech.)*; Bai, Hongmin *(Dept. of Neurosurgery, Guangzhou General Hospital of Guangz)*; Zhang, Xiaodong *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Hu, Qingmao* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*

**08:45-09:00**  FrAT8.4

**Classification of Low-Grade and High-Grade Glioma using Multi-Modal Image Radiomics Features**

Cho, Hwan-ho *(Sungkyunkwan Univ.)*; Park, Hyunjin* *(Sungkyunkwan Univ.)*

**09:00-09:15**  FrAT8.5

**Contribution to Speech Development of the Right Anterior Putamen Revealed with Multivariate Tensor-Based Morphometry**

Vlasova, Roza* *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Wang, Yalin *(Arizona State Univ.)*; Dirks, Holly *(Brown Univ.)*; Dean, Douglas *(Univ. of Wisconsin-Madison)*; O'Muircheartaigh, Jonathan *(Brown Univ.)*; Gonzalez, Sara *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Nguyen, Binh Kien *(CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles)*; Nelson, Marvin *(Univ. of Southern California and Keck School of Medicine)*; Deoni, Sean *(Univ. of Colorado)*; Lepore, Natasha *(Univ. of Southern California / Children's Hospital Los Angeles)*

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**FrAT9:**  08:00-09:30  Plonsey Room

**Neural Prosthetic Devices usable for Animal and Clinical Studies, in Asian Countries** (Minisymposium)

**Chair:** Hayashida, Yuki *(Osaka University)*

**Co-Chair:** Kim, Kyung Hwan *(Yonsei University)*

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**08:00-08:15**  FrAT9.1

**The Brain Mapping System Design with Closed-Loop Stimulation Capability for Seizure Onset Region Mapping and Control for Epileptic Patients**

Cheng, Cheng-Hsiang *(National Chiao Tung University)*; Ker, Ming-Dou *(National Chiao Tung University)*; Lee, Chen-Yi *(National Chiao Tung University)*; Hsin, Yue-Loong *(Chung Shan Medical University)*; Liang, Sheng-Fu *(National Cheng Kung University)*; Shaw, Fu-Zen *(National Cheng Kung University)*; Wu, Chung-Yu* *(National Chiao Tung University)*

**08:15-08:30**  FrAT9.2

**Implantable Optoelectronic Devices for Measurement and Control of Neural Functions**

Sasagawa, Kiyotaka* *(Nara Institute of Science and Tech.)*; Haruta, Makito *(Nara Institute of Science and Tech.)*; Yamaguchi, Takahiro *(Nara Institute of Science and Tech.)*; Fujimoto, Koki *(Nara Institute of Science and Tech.)*; Sunaga, Yoshinori *(Nara Institute of Science and Tech.)*; Ohta, Yasumi *(Nara Institute of Science and Tech.)*; Noda, Toshihiko *(Nara Institute of Science and Tech.)*; Tokuda, Takashi *(Nara Institute of Science and Tech.)*; Ohta, Jun *(Nara Institute of Science and Tech.)*

**08:30-08:45**  FrAT9.3

**Wireless Device System for Multi-Channel Intra-Cortical Microstimulations – Evaluation with Animal Studies in Vivo**

Hayashida, Yuki* *(Osaka University)*

**08:45-09:00**  FrAT9.4

**Neural Signal Processing for Closed-Loop Neuromodulation**

Kim, Kyung Hwan* *(Yonsei University)*

**09:00-09:15**  FrAT9.5

**A Multi-Channel Neural Recording ASIC Chip for a Fully Implantable Wireless BMI System**

Kameda, Seiji* *(Osaka Univ.)*; Ando, Hiroshi *(NICT)*; Kamata, Takatsugu *(Osaka Univ.)*; Imajo, Kaoru *(Nihon Kohden Corp.)*; Suzuki, Katsuyoshi *(Nihon Kohden Corp.)*; Suzuki, Takafumi *(National Institute of Information and Communications Technology)*; Hirata, Masayuki *(Osaka Univ. Medical School)*

**09:15-09:30**  FrAT9.6

**Design of a Novel Epiretinal Microelectrode Array for Improving Retinal Stimulation Spatial Resolution by Computational Modeling**

Li, Liming* *(Shanghai Jiao Tong Univ.)*; Lyu, Qing *(Shanghai Jiao Tong Univ.)*; Chen, Yao *(Shanghai Jiao Tong Univ.)*; Chai, Xinyu *(Shanghai JiaoTong Univ., China)*

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**FrAT10:**  08:00-09:30  Schmitt Room

**General and Theoretical Informatics – Machine Learning I** (Oral Session)

**Chair:** Kim, Yongwook Bryce *(Massachusetts Institute of Technology)*

**Co-Chair:** Ikeda, Kazushi *(Nara Institute of Science and Technology)*

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**08:00-08:15**  FrAT10.1

**Collision Frequency Locality-Sensitive Hashing for Prediction of Critical Events**

Kim, Yongwook Bryce* *(Massachusetts Institute of Technology)*; Hemberg, Erik *(MIT CSAIL)*; O'Reilly, Una-May *(Massachusetts Institute of Technology)*

**08:15-08:30**  FrAT10.2

**Optimized Automatic Sleep Stage Classification using the Normalized Mutual Information Feature Selection (NMIFS) Method**

Cho, Dongrae* *(Gwangju Institute of Science and Tech.)*; Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

**08:30-08:45**                                    **FrAT10.3**

**Application of SsVGMM to Medical Data – Classification with Novelty Detection**

Yang, Fan *(Nara Institute of Science and Technology)*; Soriano, Jaymar *(Nara Institute of Science and Technology)*; Kubo, Takatomi\* *(Nara Institute of Science and Technology)*; Ikeda, Kazushi *(Nara Institute of Science and Technology)*

**08:45-09:00**                                    **FrAT10.4**

**Ensemble Transfer Learning for Alzheimer's Disease Diagnosis**

Colbaugh, Richard *(Periander Ltd)*; Glass, Kristin\* *(Periander Ltd)*; Gallegos, Gil *(New Mexico Highlands University)*

**09:00-09:15**                                    **FrAT10.5**

**Learning about Individuals' Health from Aggregate Data**

Colbaugh, Richard *(Periander Ltd)*; Glass, Kristin\* *(Periander Ltd)*

**09:15-09:30**                                    **FrAT10.6**

**Comparing Deep Neural Network and Other Machine Learning Algorithms for Stroke Prediction in a Large-Scale Population-Based Electronic Medical Claims Database**

Hung, Chen-Ying *(National Tsing Hua University)*; Chen, Wei-Chen *(Dept. of Electrical Engineering, National Tsing Hua University)*; Lai, Po-Tsun *(Dept. of Electrical Engineering, National Tsing Hua University)*; Lin, Ching-Heng *(Dept. of Medical Research, Taichung Veterans General Hospital)*; Lee, Chi-Chun\* *(National Tsing Hua University)*

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**FrAT11:**   08:00-09:30                     Greatbatch Room
**Cardiovascular Variability** (Oral Session)
**Chair:** Lee, Boreom *(Gwangju Institute of Science & Tech. (GIST))*

**08:00-08:15**                                    **FrAT11.1**

**Evaluating the Association between Cardiac and Peripheral Resistance Arms of the Baroreflex**

Porta, Alberto\* *(Universita' degli Studi di Milano)*; Bari, Vlasta *(IRCCS Policlinico San Donato)*; Ranuzzi, Giovanni *(Dept. of Cardiothoracic, Vascular Anesthesia and Intensive)*; De Maria, Beatrice *(IRCCS Fondazione Salvatore Maugeri, Milano)*; Malacarne, Mara *(Dipartimento di Biotecnologie Mediche e Medicina Traslazionale,)*; Pagani, Massimo *(Università degli studi di Milano)*; Lucini, Daniela *(Università degli studi di Milano)*

**08:15-08:30**                                    **FrAT11.2**

**Changes in Heart Rate Variability of Patients with Delirium in Intensive Care Unit**

Oh, Jooyoung\* *(Gwangju Institute of Science and Technology)*; Cho, Dongrae *(Gwangju Institute of Science and Technology)*; Kim, Jongin *(Gwangju Institute of Science and Technology)*; Heo, Jaeseok *(Yonsei University)*; Park, Jaesub *(Yonsei University)*; Na, Se Hee *(Yonsei University)*; Shin, Cheung Soo *(Yonsei University)*; Kim, Jae-Jin *(Yonsei University)*; Park, Jin Young *(Yonsei University)*; Lee, Boreom *(Gwangju Institute of Science and Technology (GIST))*

**08:30-08:45**                                    **FrAT11.3**

**A Stochastic and Mathematically Integrative Model of the Control of Human Heart Rate**

BuSha, Brett\* *(The College of New Jersey)*

**08:45-09:00**                                    **FrAT11.4**

**Towards the Identification of Subjects Prone to Develop Atrial Fibrillation after Coronary Artery Bypass Graft Surgery via Univariate and Multivariate Complexity Analysis of Heart Period Variability**

Bari, Vlasta\* *(IRCCS Policlinico San Donato)*; Ranucci, Marco *(Dept. of Cardiothoracic, Vascular Anesthesia and Intensive)*; De Maria, Beatrice *(IRCCS Fondazione Salvatore Maugeri, Milano)*; Ranuzzi, Giovanni *(Dept. of Cardiothoracic, Vascular Anesthesia and Intensive)*; Pistuddi, Valeria *(Dept. of Cardiothoracic, Vascular Anesthesia and Intensive)*; Porta, Alberto *(Universita' degli Studi di Milano)*

**09:00-09:15**                                    **FrAT11.5**

**Respiratory-Gated Auricular Vagal Afferent Nerve Stimulation (RAVANS) Effects on Autonomic Outflow in Hypertension**

Sclocco, Roberta\* *(Massachusetts General Hospital, Harvard Medical School)*; Garcia, Ronald *(Massachusetts General Hospital)*; Gabriel, Aileen *(Brigham and Women's Hospital)*; Kettner, Norman *(Logan College of Chiropractic)*; Napadow, Vitaly *(Massachusetts General Hospital)*; Barbieri, Riccardo *(Politecnico di Milano)*

**09:15-09:30**                                    **FrAT11.6**

**Multiscale Sample Entropy of Heart Rate and Blood Pressure: Methodological Aspects**

Castiglioni, Paolo\* *(Fondazione Don Carlo Gnocchi ONLUS)*; Brambilla, Lorenzo *(Fondazione Don Carlo Gnocchi, Parma, Italy)*; Bini, Matteo *(Dept. of Clinical and Experimental Medicine)*; Coruzzi, Paolo *(Dept. of Clinical and Experimental Medicine)*; Faini, Andrea *(Istituto Auxologico Italiano)*

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**FrAT14:**   08:00-09:30                     Schaldach Room
**Image Classification I** (Oral Session)

**08:00-08:15**                                    **FrAT14.1**

**CAD for Prostate Cancer Detection based on Multiparametric Data**

Meriaudeau, Fabrice\* *(Universite de Bourgogne)*; Lemaitre, Guillaume *(LE2I - UMR 6306)*; Ratsgoo, Mojdeh *(LE2I - UMR 6306)*; Martí, Robert *(University of Girona)*

**08:15-08:30**                                    **FrAT14.2**

**Detecting Impaired Vision Caused by AMD from Gaze Data**

Liu, Huiying\* *(Institute for Infocomm Research)*; Xu, Yanwu *(Institute for Infocomm Research)*; Wong, Damon *(Institute for Infocomm Research)*; Yow, Ai Ping *(Institute for Infocomm Research)*; Laude, Augustinus *(Tan Tock Seng Hospital)*; Lim, Tock Han *(Tan Tock Seng Hospital)*

**08:30-08:45**                                    **FrAT14.3**

**Gabor-Based Automatic Spinal Level Identification in Ultrasound**

Ikhsan, Mohammad\* *(National University of Singapore)*; Tan, Kok Kiong *(National University of Singapore)*; Oh, Ting Ting *(KK Women's and Children's Hospital)*; Sng, Ban Leong *(KK Women's and Children's Hospital)*; Lew, John Paul *(KK Women's and Children's Hospital)*

**08:45-09:00**                                    **FrAT14.4**

**Image Recognition with Missing-Features based on Gaussian Mixture Model and Graph Constrained Nonnegative Matrix Factorization**

Zhang, Zhuyan *(East China University of Science and Tech.)*; Zhu, Hongqing\* *(East China University of Science and Tech.)*; Tao, Xuan *(East China University of Science and Tech.)*

**09:00-09:15**                                    **FrAT14.5**

**Gastrointestinal Bleeding Detection in Wireless Capsule Endoscopy Images using Handcrafted and CNN Features**

Jia, Xiao\* *(The Chinese University of Hong Kong)*; Meng, Max Q.-H. *(The Chinese University of Hong Kong)*

**09:15-09:30**                                    **FrAT14.6**

**Automated Angiodysplasia Detection from Wireless Capsule Endoscopy**

Noya, Ferran *(Automatic Control Dept., Universitat Politècnica de Catalun)*; Álvarez-González, Marco Antonio *(Endoscopy Unit, Dept. of Digestive Diseases, Hospital del M)*; Benitez, Raul\* *(Universitat Politecnica de Catalunya)*

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**FrAT17:**   08:00-09:30                     Einthoven Hall
**Signal Processing – Cardiovascular Signals** (Oral Session)
**Chair:** Burattini, Laura *(Università Politecnica delle Marche)*

**08:00-08:15**                                    **FrAT17.1**

**Intracardiac Electrogram Envelope Detection during Atrial Fibrillation using Fast Orthogonal Search**

Hashemi, Javad\* *(Queen's University)*; Shariat, Mohammad Hassan *(Queen's University, Kingston, Ontario, Canada)*; Redfearn, Damian P *(Queen's University)*

**08:15-08:30** FrAT17.2

**Statistical Baseline Assessment in Cardiotocography**

Agostinelli, Angela *(Polytechnic Univ. of Marche)*; Braccili, Eleonora *(Univ. Politecnica delle Marche)*; Marchegiani, Enrico *(Univ. Politecnica delle Marche)*; Rosati, Riccardo *(Univ. Politecnica delle Marche)*; Sbrollini, Agnese *(Univ. Politecnica delle Marche)*; Burattini, Luca *(Univ. Politecnica delle Marche)*; Morettini, Micaela *(Univ. Politecnica delle Marche)*; Di Nardo, F. *(Polytechnic Univ. of Marche)*; Fioretti, S. *(Univ. Politecnica delle Marche)*; Burattini, L.* *(Univ. Politecnica delle Marche)*

**08:30-08:45** FrAT17.3

**Nonlinear Analysis of Heart Rate Variability for the Assessment of Dysphoria**

Greco, Alberto* *(Univ. of Pisa)*; Messerotti Benvenuti, Simone *(Univ. of Padova)*; Gentili, Claudio *(Univ. of Pisa)*; Palomba, Daniela *(Univ. of Padova)*; Valenza, Gaetano *(Univ. of Pisa)*; Scilingo, Enzo Pasquale *(Univ. of Pisa)*

**08:45-09:00** FrAT17.4

**Classification Enhancement for Post-Stroke Dementia using Fuzzy Neighborhood Preserving Analysis with QR-Decomposition**

Al-Qazzaz, Noor* *(UKM)*; Md Ali, Sawal Hamid *(National University of Malaysia)*; Siti Anom, Ahmad *(Universiti Putra Malaysia)*; Escudero, Javier *(University of Edinburgh)*

**09:00-09:15** FrAT17.5

**Attenuation of Vagal Modulation with Aging: Univariate and Bivariate Analysis of HRV**

Costa Oliveira Junior, Evandro* *(University of Brasilia)*; Oliveira, Flavia M. G. S. A. *(University of Brasilia)*

**Nonlinear Dynamic Analysis I – Biomedical Signals** (Oral Session)

**08:00-08:15** FrAT18.1

**Multiscale Dispersion Entropy for the Regional Analysis of Resting-State Magnetoencephalogram Complexity in Alzheimer's Disease**

Azami, Hamed *(University of Edinburgh)*; Kinney-Lang, Eli* *(University of Edinburgh)*; Ebied, Ahmed *(University of Edinburgh)*; Fernandez, Alberto *(Universidad Complutense de Madrid)*; Escudero, Javier *(University of Edinburgh)*

**08:15-08:30** FrAT18.2

**Gait Variability Assessment in Neuro-Degenerative Patients by Measuring Complexity of Independent Sources**

Heydarzadeh, Mehrdad *(The Univ. of Texas at Dallas)*; Nourani, Mehrdad *(Univ. of Texas at Dallas)*; Tan, Chin-Tuan* *(Univ. of Texas, Dallas)*; Ostadabbas, Sarah *(Northeastern Univ.)*

**08:30-08:45** FrAT18.3

**Complexity Analysis of Resting State fMRI Signals in Depressive Patients**

Ho, Pei-Shan *(National Tsing Hua Univ., Hsinchu)*; Lin, Chemin *(Keelung Chang Gung Memorial Hospital)*; Chen, Guan-Yen *(National Tsing Hua Univ.)*; Liu, Ho-Ling *(Univ. of Texas, MD Anderson Cancer Center)*; Huang, Chih-Mao *(National Chiao Tung Univ.)*; Lee, Tatia Mei-Chun *(The Univ. of Hong Kong)*; Lee, Shwu-Hua *(Linkou Chang Gung Memorial Hospital)*; Wu, Shun Chi* *(National Tsing Hua Univ.)*

**08:45-09:00** FrAT18.4

**Predicting Learning Dynamics in Multiple-Choice Decision-Making Tasks using a Variational Bayes Technique**

Yousefi, Ali* *(Massachusetts General Hospital and Harvard Medical School)*; Kakooee, Reza *(Tarbiat Modares Univ.)*; Hamidi Beheshti, Mohammad Taghi *(Tarbiat Modares Univ.)*; Dougherty, Darin *(Massachusetts General Hospital)*; Eskandar, Emad *(Massachusetts General Hospital)*; Widge, Alik *(Massachusetts General Hospital)*; Eden, Uri *(Boston Univ.)*

**09:00-09:15** FrAT18.5

**A Closed-Form Unsupervised Geometry-Aware Dimensionality Reduction Method in the Riemannian Manifold of SPD Matrices**

Congedo, Marco* *(CNRS, Univ. Grenoble Alpes)*; Rodrigues, Pedro Luiz Coelho *(Escola Politécnica USP)*; Bouchard, Florent *(Gipsa-lab, Univ. Grenoble Alpes)*; Barachant, Alexandre *(Independent Researcher)*; Jutten, Christian *(Univ. of Grenoble)*

**09:15-09:30** FrAT18.6

**Real-Time Physiological Tremor Estimation using Recursive Singular Spectrum Analysis**

Adhikari, Kabita* *(Newcastle Univ.)*; Tatinati, Sivanagaraja *(Nanyang Technological Univ.)*; Veluvolu, Kalyana C. *(Kyungpook National Univ.)*; Chambers, Jonathon A. *(Newcastle Univ.)*; Nazarpour, Kianoush *(Newcastle Univ.)*

**Signal Pattern Classification – EEG I** (Oral Session)
**Chair:** Zhang, Dan *(Tsinghua University)*

**10:50-11:05** FrBT1.1

**Integrating Channel Selection and Feature Selection in a Real Time Epileptic Seizure Detection System**

Wang, Hongda* *(The Chinese University of Hong Kong)*; Shi, Weiwei *(Shenzhen University)*; Choy, Chiu Sing *(The Chinese University of Hong Kong)*

**11:05-11:20** FrBT1.2

**Evidences of Brain Functional Deficits following Sport-Related Mild Traumatic Brain Injury**

Munia, Tamanna Tabassum Khan *(University of North Dakota)*; Haider, Md. Ali *(University of North Dakota)*; Fazel-Rezai, Reza* *(University of North Dakota)*

**11:20-11:35** FrBT1.3

**Estimating Unmeasured Invasive EEG Signals using a Reduced-Order Observer**

Gunnarsdottir, Kristin* *(Johns Hopkins University)*; Li, Adam *(Neuromedical Control Systems Laboratory)*; Bulacio, Juan *(Cleveland Clinic)*; Gonzalez-Martinez, Jorge *(Cleveland Clinic)*; Sarma, Sridevi V. *(Johns Hopkins University)*

**11:35-11:50** FrBT1.4

**A Mental Fatigue Index based on Regression using Mulitband EEG Features with Application in Simulated Driving**

Dimitrakopoulos, Georgios *(Univ. of Patras)*; Kakkos, Ioannis *(National Univ. Singapore)*; Thakor, Nitish *(Johns Hopkins Univ.)*; Bezerianos, Anastasios* *(National Univ. of Singapore)*; Sun, Yu *(National Univ. of Singapore)*

**11:50-12:05** FrBT1.5

**Decoding Brain Cognitive Activity across Subjects using Multimodal M/EEG Neuroimaging**

Fatima, Sarwat *(National University of Science and Technology)*; Kamboh, Awais Mehmood* *(School of Electrical Engineering and Computer Science, National)*

**12:05-12:20** FrBT1.6

**EEG-Based Approach-Withdrawal Index for the Pleasantness Evaluation during Taste Experience in Realistic Settings**

Di Flumeri, Gianluca* *(Univ. of Rome Sapienza)*; Arico, Pietro *(Fondazione Santa Lucia)*; Borghini, Gianluca *(Univ. of Rome Sapienza)*; Sciaraffa, Nicolina *(Dept. of Computer, Control and Management Engineering)*; Maglione, Anton Giulio *(Univ. of Rome Sapienza)*; Rossi, Dario *(Univ. of Rome Sapienza)*; Modica, Enrica *(Univ. of Rome Sapienza)*; Mascarell Llorens, Ignacio *(Dept. of Clinical and Experimental Neuroscience)*; Trettel, Arianna *(BrainSigns)*; Babiloni, Fabio *(Univ. of Rome)*; Colosimo, Alfredo *(Univ. of Rome "Sapienza")*; Herrero Exquerro, Maria Trinidad *(Univ. of Murcia)*

**Innovative Ultrasound Imaging** (Oral Session)
**Chair:** Lavarello, Roberto *(Pontificia Universidad Catolica del Peru)*
**Co-Chair:** Park, Kwan Kyu *(Hanyang University)*

**10:50-11:05** FrBT2.1

**Multimodal Ultrasound Imaging based Diagnosis of Liver Cancers with a Two-Stage Multi-View Learning Framework**

Yiyi, Qian *(Shanghai University)*; Shi, Jun* *(Shanghai University)*; Zheng, Xiao *(Shanghai University)*; Zhang, Qi *(Shanghai University)*; Lehang, Guo *(Shanghai Tenth People's Hospital)*; Dan, Wang *(Shanghai Tenth People's Hospital)*; Huixiong, Xu *(Shanghai Tenth People's Hospital)*

**11:05-11:20**  FrBT2.2
**Myocardial Elastogram using a Fast Mapping Algorithm**
Wang, Yinong *(Institute of Medical Information, School of Biomedical Engineeri)*; Song, Xiangfen *(Institute of Medical Information, School of Biomedical Engineeri)*; Huang, Zhijie *(Institute of Medical Information, School of Biomedical Engineeri)*; Wang, Qing\* *(Southern Medical University,)*

**11:20-11:35**  FrBT2.3
**Image-Guided Laparoscopic Pelvic Lymph Node Dissection using Stereo Visual Tracking Free-Hand Laparoscopic Ultrasound**
Ma, Lei\* *(School of Bioengineering, The Univ. of Tokyo)*; Nakamae, Kenta *(The Univ. of Tokyo)*; Wang, Junchen *(The Univ. of Tokyo)*; Kiyomatsu, Hidemichi *(The Univ. of Tokyo)*; Tsukihara, Hiroyuki *(The Univ. of Tokyo)*; Kobayashi, Etsuko *(The Univ. of Tokyo)*; Sakuma, Ichiro *(The Univ. of Tokyo)*

**11:35-11:50**  FrBT2.4
**Tracking Large Anterior Mitral Leaflet Displacements by Incorporating Optical Flow in an Active Contours Framework**
Sultan, Malik Saad *(Univ. of Porto)*; Martins, Nelson *(Enermeter, Sistemas de Medição, Lda & Instituto de Telecom.)*; Eva, Costa *(Enermeter, Sistemas de Medição, Lda, Braga, Portugal)*; Veiga, Diana *(Enermeter, Sistemas de Medição lda/ Centro Algoritmi, Univ.)*; Ferreira, Manuel Joao *(Univ. of Minho)*; Sandra, Mattos *(Cículo do Coração de Pernambuco, Recife PE, Brazil)*; Coimbra, Miguel\* *(Instituto de Telecom/Univ. do Porto)*

**11:50-12:05**  FrBT2.5
**Automatic Initialization for Active Contour Model in Breast Cancer Detection Utilizing Conventional Ultrasound and Color Doppler**
Keatmanee, Chadaporn\* *(Japan Advanced Institute of Science and Technology (JAIST))*; Makhanov, Stanislav *(Sirinthorn International Institute of Technology)*; Kazunori, Kotani *(Japan Advanced Institute of Science and Technology (JAIST))*; Lohitvisate, Wanrudee *(Dept. of Radiology, Thammasat University)*; Tongvigitmanee, Saowapak *(National Electronics and Computer Technology Center)*

FrBT3:  10:50-12:20  Park Room
**MRI Image Reconstruction** (Oral Session)
**Chair:**  Qu, Xiaobo *(Xiamen University)*

**10:50-11:05**  FrBT3.1
**4D Real-Time Phase-Contrast Flow MRI with Sparse Sampling**
Sun, Aiqi\* *(Center for Biomedical Imaging Research, Tsinghua University)*; Zhao, Bo *(Martinos Center for Biomedical Imaging, MGH and Harvard Medical)*; Li, Rui *(Tsinghua University)*; Yuan, Chun *(Tsinghua University, Center of Biomedical Imaging Research; Univ)*

**11:05-11:20**  FrBT3.2
**Fast Dictionary Generation and Searching for Magnetic Resonance Fingerprinting**
Xie, Jun *(Hangzhou Normal University)*; Jian, Zhang *(Hangzhou Normal University)*; Lyu, Mengye *(Hong Kong University)*; Hui, Edward S. *(The University of Hong Kong)*; Wu, Ed X. *(The University of Hong Kong)*; Wang, Ze\* *(Temple University)*

**11:20-11:35**  FrBT3.3
**Parallel Compressive Sensing in a Hybrid Space: Application in Interventional MRI**
Vafay Eslahi, Samira\* *(Texas A&M University)*; Dhulipala, Pranav Vaidik *(Texas A&M University)*; Shi, Caiyun *(Shenzhen Institutes of Advanced Technology, Lauterbur Research C)*; Xie, Guoxi *(Shenzhen Institutes of Advanced Technology, Lauterbur Research C)*; Ji, Jim Xiuquan *(Texas A&M University)*

**11:35-11:50**  FrBT3.4
**Simultaneous Multislice Magnetic Resonance Fingerprinting with Low-Rank and Subspace Modeling**
Zhao, Bo\* *(MGH/HST Athinoula Martinos Center for Biomedical Imaging, Harvar)*; Bilgic, Berkin *(Martinos Center for Biomedical Imaging)*; Adalsteinsson, Elfar *(MIT/MGH Martinos Center)*; Griswold, Mark *(Case Western Reserve University)*; Wald, Lawrence L. *(A. A. Martinos Center for Biomedical Imaging, Dept. of Radiology)*; Setsompop, Kawin *(Harvard Medical School)*

**11:50-12:05**  FrBT3.5
**A Low Rank Hankel Matrix Reconstruction Method for Ultrafast Magnetic Resonance Spectroscopy**
Lu, Hengfa *(Xiamen Univ.)*; Zhang, Xinlin *(Xiamen Univ.)*; Qiu, Tianyu *(Xiamen Univ.)*; Yang, Jian *(Xiamen Univ.)*; Guo, Di *(Xiamen Univ.)*; Chen, Z. *(Xiamen Univ.)*; Qu, X.\* *(Xiamen Univ.)*

FrBT4:  10:50-12:20  Min Room
**Body Sensor Networks – Molecules, Radio, and Machine Learning – II** (Invited Session)
**Chair:**  Balasingham, Ilangko *(Oslo University Hospital and Norwegian University of Science and Technology)*
**Co-Chair:**  Sugimachi, Masaru *(Natl Cardio Center Research Inst)*

**10:50-11:05**  FrBT4.1
**Estimation of Pathlength Travelled by a Capsule Endoscope**
Bjørnevik, Anders *(Kongsberg Seatex)*; Floor, Pål Anders *(NTNU, Gjøvik)*; Balasingham, Ilangko\* *(Oslo University Hospital and Norwegian University of Science and)*

**11:05-11:20**  FrBT4.2
**Next Generation Body Area Network for Healthcare Application, SmartBAN**
Tanaka, Hirokazu\* *(Hiroshima City University)*; Hatakeyama, Yasutaka *(Hiroshima City University)*; Komori, Tatsuya *(Toshiba Development & Engineering Corporation)*; Matsukuma, Takeshi *(Toshiba Development & Engineering Corporation)*

**11:20-11:35**  FrBT4.3
**A Multi-Scale Computational Model of Noninvasive Brain Stimulation: Investigation of Activation of Cortical Neurons**
Seo, Hyeon *(Gwangju Institute of Science and Tech.)*; Schaworonkow, Natalie *(Frankfurt Institute for Advanced Studies)*; Triesch, Jochen *(Frankfurt Institute for Advanced Studies)*; Kim, Hyoung-Ihl *(Gwangju Institute of Science and Tech.)*; Jun, Sung Chan\* *(Gwangju Institute of Science and Tech.)*

**11:35-11:50**  FrBT4.4
**Flexible Wearable Sensor Nodes with Solar Energy Harvesting**
Wu, Taiyang\* *(Monash Univ.)*; Arefin, Md S. *(Monash Univ.)*; Redouté, J.-M. *(Monash Univ.)*; Yuce, M. *(Monash Univ.)*

**11:50-12:05**  FrBT4.5
**Comparison of Hand-Craft Feature based SVM and CNN based Deep Learning Framework for Automatic Polyp Classification**
Shin, Younghak\* *(NTNU (Norwegian University of Science and Technology))*; Balasingham, Ilangko *(Oslo University Hospital and Norwegian University of Science and)*

FrBT5:  10:50-12:20  Lee Room
**Wearable Sensors and Systems I** (Oral Session)
**Chair:**  Armentano, Ricardo Luis *(Republic University)*

**10:50-11:05**  FrBT5.1
**A Wearable Autonomous Heart Rate Sensor based on Piezoelectric-Charge-Gated Thin-Film Transistor for Continuous Multi-Point Monitoring**
Rasheed, Ahmed *(Sun Yat-Sen University (SYSU)-Carnegie Mellon University (CMU) J)*; Iranmanesh, Emad *(SYSU-CMU, JIE)*; Wang, Kai\* *(Sun Yat-Sen University)*

**11:05-11:20**  FrBT5.2
**Low Group Delay Signal Conditioning for Wearable Central Blood Pressure Monitoring Device**
Fierro, Germán *(Univ. de la Republica)*; Silveira, Fernando\* *(Univ. de la Republica)*; Armentano, Ricardo Luis *(Republic Univ.)*

**11:20-11:35**  FrBT5.3
**Hemodynamic Sensing of 3D Fingertip Force using PPG Device on Proximal Part**
Yoshimoto, Shunsuke\* *(Osaka Univ.)*; Hinatsu, Shun *(Osaka Univ.)*; Kuroda, Y. *(Osaka Univ.)*; Oshiro, O. *(Osaka Univ.)*

**11:35-11:50**  FrBT5.4
**Tarsusmeter: Development of a Wearable Device for Ankle Joint Impedance Estimation**
Hassan, Modar\* *(Univ. of Tsukuba)*; Yagi, Keisuke *(Univ. of Tsukuba)*; Hsiao, Kaiwen *(Univ. of Tsukuba)*; Mochiyama, Hiromi *(Univ. of Tsukuba)*; Suzuki, Kenji *(Univ. of Tsukuba)*

**July 14 Friday**

**11:50-12:05**                           FrBT5.5
**Development of a Smartphone-Based Pulse Oximeter with Adaptive SNR/Power Balancing**
Phelps, Thomas *(University of California, San Diego)*;
Jiang, Haowei *(University of California San Diego)*;
Hall, Drew* *(University of California, San Diego)*

**12:05-12:20**                           FrBT5.6
**Measurement of Heartbeat Intervals in a Sitting Position using Multiple Piezoelectric Sensors with Body Movement Reduction**
Igasaki, Tomohiko* *(Kumamoto Univ.)*; Shimai, Shogo
*(Kumamoto Univ.)*; Kobayashi, Makiko *(Kumamoto Univ.)*

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**FrBT6:** 10:50-12:20                    Zworykin Room
**Microfluidic Systems for Cell Manipulation and Analysis** (Invited Session)
**Chair:** Chen, Weiqiang *(New York University)*
**Co-Chair:** Lam, Raymond H. W. *(City University of Hong Kong)*

**10:50-11:05**                           FrBT6.1
**Nanoplasmon Ruler for Visualizing How Cells "Talk"**
Yang, Wen *(Auburn University)*; Jiacheng, He *(Auburn University)*; Chen, Pengyu* *(Auburn University)*

**11:05-11:20**                           FrBT6.2
**Microfluidic Vascularized Microsystem for Probing Inflammation-Biased Angiogenesis**
Cui, Xin *(New York University)*; Morales, Renee-Tyler Tan *(New York University)*; Chen, Weiqiang* *(New York University)*

**11:20-11:35**                           FrBT6.3
**A Microfluidic Device with Hydrodynamic Trap Arrays for White Blood Cell Counting in Peritoneal Dialysis Solution**
Hwong, Yuh Jen *(National Taiwan University)*;
Huang, Nien-Tsu* *(National Taiwan University)*

**11:35-11:50**                           FrBT6.4
**Microfluidic Eye-Chamber-on-a-Chip for Modeling Oil Emulsification**
Chan, Yau Kei *(The Univ. of Hong Kong, Pokfulam Road, Hong Kong)*; Shum, Ho Cheung 浩璋* *(The Univ. of Hong Kong)*

**11:50-12:05**                           FrBT6.5
**Microfluidic Platforms for Single Cell Studies and Analysis: From Simple Devices to Channel-Less Systems**
Qasaimeh, Mohammad Ameen* *(New York Univ. Abu Dhabi)*

**12:05-12:20**                           FrBT6.6
**A Microfluidic Multiplex Immunoassay Platform for Quantifying Transient Cytokine Secretions of Immune Cells**
Lam, Raymond H. W.* *(City University of Hong Kong)*; Cui, Xin *(New York University)*; Chen, Weiqiang *(New York University)*

**12:05-12:20**                           FrBT6.7
**Towards Massively Parallelized Individual Cell Manipulations for Next Gen Biopharmaceutical Research**
Jorgolli, Marsela* *(Amgen Inc.)*

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**FrBT7:** 10:50-12:20                    Herrick Room
**Rehabilitation Technologies for Neurological Disorders using Neuromodulations** (Minisymposium)
**Chair:** Lan, Ning *(Shanghai Jiao Tong University)*
**Co-Chair:** Niu, Chuanxin M. *(Ruijin Hospital, School of Medicine, Shanghai Jiao Tong University)*

**10:50-11:05**                           FrBT7.1
**Non-Invasive Peripheral Nerve Stimulation for Tremor Suppression in PD**
Lan, Ning* *(Shanghai Jiao Tong Univ.)*; Hao, Manzhao *(School of Biomedical Eng., Shanghai Jiao Tong Univ.)*; Hu, Zixiang *(Med-X Research Inst., School of Biomedical Eng., Shang)*; Xiao, Qin *(Dept. of Neurology & Inst. of Neurology, Ruijin Hospital)*

**11:05-11:20**                           FrBT7.2
**Low-Frequency Bilateral DBS at Subthalamic Nucleus Alters Vocal Responses in Individuals with Parkinson's Disease**
Niu, Chuanxin M.* *(Ruijin Hospital, School of Medicine, Shanghai Jiao Tong Univ.)*; Pan, Yixin *(Ruijin Hospital, School of Medicine, Shanghai Jiao Tong Univ.)*; Li, Dianyou *(Ruijin Hospital, School of Medicine, Shanghai Jiao Tong Univ.)*

**11:20-11:35**                           FrBT7.3
**Deep Brain Stimulation in China**
Li, Luming* *(Tsinghua University)*

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**FrBT8:** 10:50-12:20                    Schwan Room
**Brain Networks and Connectivity** (Oral Session)
**Chair:** Barbieri, Riccardo *(Politecnico di Milano)*

**10:50-11:05**                           FrBT8.1
**Dynamical Brain Connectivity Estimation using GARCH Models: An Application to Personality Neuroscience**
Riccelli, Roberta *(Laboratory of Neuromotor Physiology, IRCCS Santa Lucia Foundatio)*; Passamonti, Luca *(Univ. of Cambridge)*; Duggento, Andrea *(Univ. of Rome "Tor Vergata")*; Guerrisi, Maria *(Univ. of Rome "Tor Vergata")*; Indovina, Iole *(Lab of Neuromotor Physiology, IRCCS Santa Lucia Foundation)*; Terracciano, Antonio *(Dept. of Geriatrics, Florida State Univ. College of Med)*; Toschi, Nicola* *(Univ. of Rome "Tor Vergata", Faculty of Medicine)*

**11:05-11:20**                           FrBT8.2
**Mapping the Full Vascular Network in the Mouse Brain at Submicrometer Resolution**
Lee, Junseok* *(Texas A&M University, Dept. of Computer Science and Eng)*; An, Wookyung *(Texas A&M University)*; Choe, Yoonsuck *(Texas A&M University)*

**11:20-11:35**                           FrBT8.3
**Dynamic Inter-Network Connectivity in the Human Brain**
Riccelli, Roberta *(Laboratory of Neuromotor Physiology, IRCCS Santa Lucia Foundatio)*; Passamonti, Luca *(University of Cambridge)*; Duggento, Andrea* *(University of Rome "Tor Vergata")*; Guerrisi, Maria *(University of Rome "Tor Vergata")*; Indovina, Iole *(Laboratory of Neuromotor Physiology, IRCCS Santa Lucia Foundatio)*; Toschi, Nicola *(University of Rome "Tor Vergata", Faculty of Medicine)*

**11:35-11:50**                           FrBT8.4
**Resting-State Brain Correlates of Cardiovascular Complexity**
Valenza, Gaetano *(Univ. of Pisa)*; Duggento, Andrea *(Univ. of Rome "Tor Vergata")*; Passamonti, Luca *(Univ. of Cambridge)*; Diciotti, Stefano *(Alma Mater Studiorum, Univ. of Bologna)*; Tessa, Carlo *(Versilia Hospital, Azienda USL 12 Viareggio)*; Toschi, Nicola *(Univ. of Rome "Tor Vergata", Faculty of Medicine)*; Barbieri, Riccardo* *(Politecnico di Milano)*

**11:50-12:05**                           FrBT8.5
**Cognitive Control Related Network Analysis a Novel Way to Measure Neuron Fiber Connection of Alzheimer's Disease**
Zhang, Changle *(Harbin Institute of Tech. Shenzhen Graduate School)*; Chai, Tao *(Harbin Institute of Tech.)*; Mao, Shuai *(Harbin Institute of Tech. Shenzhen Graduate School)*; Gao, Na *(Harbin Institute of Tech.)*; Ma, Heather Ting* *(Harbin Institute of Tech. Shenzhen Graduate School)*

**12:05-12:20**                           FrBT8.6
**Resting-State Brain Correlates of Instantaneous Autonomic Outflow**
Valenza, Gaetano *(Univ. of Pisa)*; Duggento, Andrea *(Univ. of Rome "Tor Vergata")*; Passamonti, Luca *(Univ. of Cambridge)*; Diciotti, Stefano *(Alma Mater Studiorum, Univ. of Bologna)*; Tessa, Carlo *(Versilia Hospital, Azienda USL 12 Viareggio)*; Barbieri, Riccardo *(Politecnico di Milano)*; Toschi, Nicola* *(Univ. of Rome "Tor Vergata", Faculty of Medicine)*

**FrBT9:** 10:50-12:20          Plonsey Room
**Neural Signal Processing I** (Oral Session)
**Chair:** Li, Haifeng *(Harbin Institute of Technology)*
**Co-Chair:** Santaniello, Sabato *(University of Connecticut)*

10:50-11:05          FrBT9.1
**A Model Study of the Neural Interaction via Mutual Coupling Factor Identification**
Zhang, Qichun *(University of Essex)*;
Sepulveda, Francisco* *(University of Essex)*

11:05-11:20          FrBT9.2
**On Electrophysiological Signal Complexity during Biological Neuronal Network Development and Maturation**
Kapucu, Fikret Emre* *(Tampere Univ. of Technology)*;
Vornanen, Inkeri *(Tampere Univ. of Technology)*; Christophe,
Francois *(Tampere Univ. of Technology)*; Tanskanen, Jarno M.
A. *(Tampere Univ. of Technology)*; Johansson, Julia *(Tampere
Univ. of Technology)*; Mikkonen, Tommi *(Tampere Univ. of
Technology)*; Hyttinen, Jari *(Tampere Univ. of Technology)*

11:20-11:35          FrBT9.3
**Nonmotor Regions Encode Path-Related Information during Movements**
Breault, Macauley S.* *(Johns Hopkins Univ.)*; Sacré, Pierre
*(Johns Hopkins Univ.)*; Johnson, Jacob J. *(Indian Institute of
Technology Guwahati)*; Kerr, Matthew *(Johns Hopkins Univ.)*;
Johnson, Matthew *(Cleveland Clinic)*; Bulacio, Juan *(Cleveland
Clinic)*; Gonzalez-Martinez, Jorge *(Cleveland Clinic)*; Sarma,
Sridevi V. *(Johns Hopkins Univ.)*; Gale, John *(Cleveland Clinic)*

11:35-11:50          FrBT9.4
**Importance of Vesicle Release Stochasticity in Neuro-Spike Communication**
Ramezani, Hamideh* *(Koc Univ.)*; Akan, Ozgur B. *(Koc Univ.)*

11:50-12:05          FrBT9.5
**Music-Evoked Emotion Classification using EEG Correlation-Based Information**
Bo, Hongjian *(Harbin Institute of Tech.)*; Ma, Lin *(Harbin
Institute of Tech.)*; Li, Haifeng* *(Harbin Institute of Tech.)*

12:05-12:20          FrBT9.6
**Effects of the Temporal Pattern of Subthalamic Deep Brain Stimulation on the Neuronal Complexity in the Globus Pallidus**
Deng, Callie *(Johns Hopkins Univ.)*; Sun, Tony *(Los Altos High
School)*; Zhang, Manning *(Johns Hopkins Univ.)*; Gale, John
*(Cleveland Clinic)*; Montgomery, Erwin *(Univ. of Alabama at
Birmingham)*; Santaniello, Sabato* *(Univ. of Connecticut)*

**FrBT10:** 10:50-12:20          Schmitt Room
**General and Theoretical Informatics – Deep learning and Big Data to Knowledge** (Oral Session)
**Chair:** Nguyen, Hung T. *(University of Technology, Sydney)*

10:50-11:05          FrBT10.1
**A Separated Feature Learning based DBN Structure for Classification of SSMVEP Signals**
Jia, Yaguang *(Xi'an Jiaotong Univ.)*; Xie, Jun* *(Xi'an Jiaotong
Univ.)*; Xu, Guanghua *(Xi'an Jiaotong Univ.)*; Li, Min *(School of
Mechanical Engineering, Xi'an Jiaotong Univ.)*; Zhang, Sicong
*(Xi'an Jiaotong Univ.)*; Luo, Ailing *(Xi'an Jiaotong Univ.)*; Han,
Xingliang *(Xi'an Jiaotong Univ.)*

11:05-11:20          FrBT10.2
**The Obesity Paradox in ICU Patients**
Pan, Janice* *(The University of Texas at Austin)*; Shaffer,
Robert *(The University of Texas at Austin)*; Sinno, Zeina *(The
University of Texas at Austin)*; Tyler, Marcus *(The University of
Texas at Austin)*; Ghosh, Joydeep *(Univ. of Texas at Austin)*

11:20-11:35          FrBT10.3
**Automated Embolic Signal Detection using Deep Convolutional Neural Network**
Sombune, Praotasna *(Thammasat Univ.)*; Phienphanich,
Phongphan *(Thammasat Univ.)*; Phuechpanpaisal, Sutanya
*(Thammasat Univ.)*; Muengtaweepongsa, Sombat *(Thammasat
Univ.)*; Ruamthanthong, Anuchit *(Phramongkutklaow Hospital
Bangkok)*; Tantibundhit, Charturong* *(Thammasat Univ.)*

11:35-11:50          FrBT10.4
**A CHF Detection Method based on Deep Learning with RR Intervals**
Chen, Wenhui *(Univ. of Technology Sydney)*; Liu, Guan-Zheng
*(Shenzhen Institutes of Advanced Technology)*; Su, Steven
Weidong *(Univ. of Technology, Sydney)*; Jiang, Qing *(Sun Yat-
sen Univ.)*; Nguyen, Hung T.* *(Univ. of Technology, Sydney)*

11:50-12:05          FrBT10.5
**DeepDeath: Learning to Predict the Underlying Cause of Death with Big Data**
Hassanzadeh, Hamid* *(Georgia Institute of Technology)*;
Wang, May D. *(Georgia Tech and Emory University)*;
Sha, Ying *(Georgia Institute of Technology)*

12:05-12:20          FrBT10.6
**Automated Vision-Based Analysis of Levodopa-Induced Dyskinesia with Deep Learning**
Li, Michael Hong Gang *(University of Toronto)*; Mestre, Tiago
*(Ottawa Hospital Research Institute)*; Fox, Susan *(University of
Toronto)*; Taati, Babak* *(Toronto Rehabilitation Institute and
University of Toronto)*

**FrBT11:** 10:50-12:20          Greatbatch Room
**Cardiovascular Simulations** (Oral Session)
**Chair:** Shim, Eun Bo *(Kangwon National University)*
**Co-Chair:** Chbat, Nicolas W. *(Center of Excellence in
Critical Care Innovation)*

10:50-11:05          FrBT11.1
**Pilot Study on Vascular Intervention Training based on Blood Flow Effected Guidewire Simulation**
Cai, Jiayin *(School of Biomedical Engineering, Shanghai Jiao
Tong University)*; Xie, Hongzhi *(Peking Union Medical College
Hospital)*; Zhang, Shuyang *(Peking Union Medical College
Hospital)*; Gu, Lixu* *(Shanghai Jiaotong University)*

11:05-11:20          FrBT11.2
**Applying Computer Simulation to the Design of Flow-Diversion Treatment for Intracranial Aneurysms**
Zhang, Mingzi* *(Tohoku University)*; Li, Yujie *(Tohoku
University)*; Verrelli, David I. *(Macquarie University)*; Chong,
Winston *(Interventional Neuroradiology Unit, Dept. of
Diagnostic Ima)*; Ohta, Makoto *(University of Tohoku)*;
Qian, Yi *(Macquarie University)*

11:20-11:35          FrBT11.3
**A Sensitivity Study on Modelling a Flow-Diverting Stent as a Porous Medium using Computational Fluid Dynamics**
Li, Yujie* *(Tohoku Univ.)*; Zhang, Mingzi *(Tohoku Univ.)*;
Verrelli, David I. *(Macquarie Univ.)*; Yang, William *(Mineral
Resources, CSIRO)*; Chong, Winston *(Interventional
Neuroradiology Unit, Dept. of Diagnostic Ima)*; Ohta, Makoto
*(Univ. of Tohoku)*; Qian, Yi *(Macquarie Univ.)*

11:35-11:50          FrBT11.4
**An HMM-Based Recognition Framework for Endovascular Manipulations**
Zhou, Xiaohu *(Inst. of Automation, Chinese Academy of Sciences)*;
Bian, Gui-Bin *(Inst. of Automation, Chinese Academy of Sciences)*;
Xie, Xiao-Liang *(Chinese Academy of Sciences)*; Hou, Zeng-
Guang* *(Inst. of Automation, Chinese Academy of Sciences)*

11:50-12:05          FrBT11.5
**Effect of Catheter Positions on Hemodynamics and Coil Formation after Coil Embolization**
Fujimura, Soichiro* *(Tokyo Univ. of Science)*; Takao, Hiroyuki
*(Jikei Univ. School of Medicine)*; Suzuki, Takashi *(Tokyo Univ.
of Science)*; Dahmani, Chiheb *(Technical Univ. of Munich)*;
Mamori, Hiroya *(Tokyo Univ. of science)*; Fukushima, Naoya
*(Tokyo Univ. of Science)*; Yamamoto, Makoto *(Tokyo Univ. of
Science)*; Murayama, Yuichi *(Jikei Univ. School of Medicine)*

12:05-12:20          FrBT11.6
**Effects of Septum and Pericardium on Heart-Lung Interactions in a Cardiopulmonary Simulation Model**
Karamolegkos, Nikolaos* *(Columbia University)*; Albanese,
Antonio *(Philips Research North America)*; Chbat, Nicolas W.
*(Center of Excellence in Critical Care Innovation)*

**Image Segmentation I** (Oral Session)
**Chair:** Xia, Zeyang *(Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)*

10:50-11:05      FrBT14.1
**Volumetric Analysis of Respiratory Gated Whole Lung and Liver CT Data with Motion-Constrained Graph Cuts Segmentation**
Cha, Jung Won* *(Univ. of Louisville)*; Farhangi, Mohammad Mehdi *(Univ. of Louisville)*; Dunlap, Neal *(Univ. of Louisville, Louisville)*; Amini, Amir *(Univ. of Louisville)*

11:05-11:20      FrBT14.2
**Development of a Radiobiological Evaluation Tool to Assess the Expected Clinical Impacts of Contouring Accuracy between Manual and Semi-Automated Segmentation Algorithms**
Kim, Yusung *(Dept. of Radiation Oncology, The Univ. of Iowa)*; Patwardhan, Kaustubh *(The Univ. of Iowa)*; Beichel, Reinhard *(The Univ. of Iowa)*; Smith, Brian *(Univ. of Iowa)*; Mart, Christopher *(Medical Univ. of South Carolina)*; Plichta, Kristin *(Univ. of Iowa)*; Tangel, Chang *(Case Western Reserve Univ.)*; Sonka, Milan *(Univ. of Iowa)*; Graham, Michael *(Univ. of Iowa)*; Magnotta, Vincent Alfonso *(Univ. of Iowa)*; Casavant, Benjamin *(Univ. of Wisconsin-Madison)*; Xia, Junyi* *(Univ. of Iowa)*; Buatti, John *(Dept. of Radiation Oncology, The Univ. of Iowa)*

11:20-11:35      FrBT14.3
**Angled Tooth Segmentation from Computerized Tomography Images**
Gan, Yangzhou *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Xia, Zeyang* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Xiong, Jing *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Zhou, Xinwen *(Shanghai Jiao Tong Univ.)*; Li, Guanglin *(Shenzhen Institutes of Advanced Tech.)*; Zhao, Qunfei *(Shanghai Jiao Tong Univ.)*

11:35-11:50      FrBT14.4
**Automatic Measurement of Fetal Nuchal Translucency from Three-Dimensional Ultrasound Data**
Nie, Siqing *(Fudan University)*; Yu, Jinhua* *(Fudan University)*; Chen, Ping *(First Maternity and Infant Hospital)*; Wang, Yuanyuan *(Fudan University)*; Guo, Yi *(Fudan University)*; Zhang, Jianqiu *(Fudan University)*

11:50-12:05      FrBT14.5
**Brain Segmentation in MR Images using a Texture-Based Classifier Associated with Mathematical Morphology**
Chang, Herng-Hua* *(National Taiwan University)*; Hsieh, Chih-Chung *(National Taiwan University)*

12:05-12:20      FrBT14.6
**Segmentation of Hyper-Acute Cerebral Infarct based on Random Forest and Sparse Coding from Diffusion Weighted Imaging**
Zhang, Xiaodong *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Elazab, Ahmed *(Shenzhen Institutes of Advanced Tech.)*; Hu, Qingmao* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*

**Point of Care Technologies** (Oral Session)
**Chair:** Penzel, Thomas *(Charite Universitätsmedizin Berlin)*
**Co-Chair:** Panescu, Dorin *(Advanced Cardiac Therapeutics)*

10:50-11:05      FrBT15.1
**Development of a Gesture and Voice Controlled System for Burn Injury Prevention in Individuals with Disabilities**
Swanepoel, Liam *(Stellenbosch Univ.)*; Van Den Heever, Dawie* *(Stellenbosch Univ.)*; Dellimore, Kiran *(Philips Research)*

11:05-11:20      FrBT15.2
**A Novel Mainstream Capnometer System for Endoscopy Delivering Oxygen**
Kabumoto, Kenichiro* *(Nihon Koden Corp.)*; Takatori, Fumihiko *(Nihon Kohden Corp.)*; Inoue, Masayuki *(Nihon Kohden Corp.)*

11:20-11:35      FrBT15.3
**A Novel Smartphone Camera-LED Communication for Clinical Signal Transmission in Mhealth-Rehabilitation System**
Pradana Rachim, Vega *(Pukyong National Univ.)*; An, Jinyoung *(Pukyong National Univ.)*; Pham, Ngoc Quan *(Pukyong National Univ.)*; Chung, Wan-Young* *(Pukyong National Univ.)*

11:35-11:50      FrBT15.4
**Profiling a Multiplex Short Tandem Repeat Loci from Human Urine with use of Low Cost On-Site Technology for Verification of Sample Authenticity**
Pires, Nuno M. M. *(University College of Southeast Norway and Institute of Appl)*; Dong, Tao* *(University College of Southeast Norway - HSN, TekMar)*; Berntzen, Lasse *(Dept. of Business, History and Social Sciences, School of B)*; Lønningdal, Torill *(Innovatoriet at Dept. of Research and Internationalisation)*

11:50-12:05      FrBT15.5
**Fall Detection using Smart Floor Sensor and Supervised Learning**
Minvielle, Ludovic* *(ENS Cachan Univ.), Tarkett GDL SA (Company))*; Atiq, Mounir *(ENS Cachan Univ.), Tarkett GDL SA (Company))*; Serra, Renan *(Tarkett GDL SA)*; Mougeot, Mathilde *(Université Paris-Diderot)*; Vayatis, Nicolas *(Centre de Mathématiques et Leurs Applications, ENS Cachan, CNRS,)*

12:05-12:20      FrBT15.6
**Respiration and Heartbeat Monitoring using a Distributed Pulsed MIMO Radar**
Walterscheid, Ingo* *(Fraunhofer FHR)*; Smith, Graeme E. *(The Ohio State University)*

**Implementation of Information Technologies for Biomedical Engineering** (Minisymposium)
**Chair:** Kim, Chulhong *(Pohang Univ. of Science and Technology)*
**Co-Chair:** Horio, Keiichi *(Kyushu Institute of Technology)*

10:50-11:05      FrBT16.1
**Imparting Motor-Skills to Humanoid Robots using Bayesian Nonparametric Latent Spaces**
Koganti, Nishanth *(Nara Institute of Science and Technology)*; Tamei, Tomoya *(Nara Institute of Science and Technology)*; Ikeda, Kazushi *(Nara Institute of Science and Technology)*; Shibata, Tomohiro* *(Kyushu Institute of Technology)*

11:05-11:20      FrBT16.2
**Development of Axillary Pressure Feedback System for Crutch Walking**
Wada, Chikamune* *(Kyushu Institute of Technology)*; Nagasaki, Takayuki *(Kyushu University of Nursing and Social Welfare)*

11:20-11:35      FrBT16.3
**Ensemble Classification for Robustness Improvement in Image-Based Diagnosis Support Systems**
Horio, Keiichi* *(Kyushu Institute of Technology)*

11:35-11:50      FrBT16.4
**Ocular Vasculature Analysis using Photoacoustic Microscopy and Random Sample Consensus Algorithm**
Jeon, Seungwan *(Pohang Univ. of Science and Technology)*; Kim, Chulhong* *(Pohang Univ. of Science and Technology)*

**Signal Processing – Electromyography** (Oral Session)
**Chair:** Kerkman, Jennifer N. *(Vrije Universiteit Amsterdam)*
**Co-Chair:** Zhang, Yingchun *(University of Houston)*

10:50-11:05      FrBT17.1
**Simulations of High-Density Surface Electromyograms in Dynamic Muscle Contractions**
Glaser, Vojko* *(Univ. of Maribor, Faculty of Electrical Engineering and Comp)*; Farina, Dario *(Bernstein Center for Computational Neuroscience, Univ. Medic)*; Holobar, Ales *(Univ. of Maribor, Faculty of Electrical Engineering and Compu)*

**11:05-11:20**          FrBT17.2

**Performance Evaluation of Noise-Assisted Multivariate Empirical Mode Decomposition and Its Application to Multichannel EMG Signals**

Zhang, Yi* *(Univ. of Electronic Science and Technology of China)*; Su, Steven Weidong *(Univ. of Technology, Sydney)*; Xu, Peng *(Univ of Electr Science and Tech of China)*; Yao, Dezhong *(Univ. of Electronic Science and Technology of China)*

**11:20-11:35**          FrBT17.3

**Measuring the Interactions between Different Locations in a Muscle to Monitor Localized Muscle Fatigue**

Bingham, Adrian* *(RMIT Univ. Melbourne)*; Poosapadi Arjunan, Sridhar *(RMIT Univ.)*; Kant Kumar, Dinesh *(RMIT Univ.)*

**11:35-11:50**          FrBT17.4

**Analysis of One Repetition during Biceps Curl Exercise among Age-Matched Adult Volunteers using Endurance, Curl Speed and Surface Electromyography Signals**

Marri, Kiran *(Indian Institute of Technology Madras, Chennai)*; Maitra, Diptasree *(IIT Madras)*; Ramakrishnan, Swaminathan* *(IIT Madras, India)*

**11:50-12:05**          FrBT17.5

**Antagonist Thigh-Muscle Activity in 6-to-8-Year-Old Children Assessed by Surface EMG during Walking**

Di Nardo, Francesco* *(Polytechnic University of Marche)*; Strazza, Annachiara *(Università Politecnica delle Marche)*; Mengarelli, Alessandro *(Università Politecnica delle Marche)*; Ercolani, Serena *(Università Politecnica delle Marche)*; Burattini, Laura *(Università Politecnica delle Marche)*; Fioretti, Sandro *(Università Politecnica delle Marche)*

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**FrBT18:** 10:50-12:20          Montgomery Hall
**Nonlinear Dynamic Analysis II – Cardiovascular Signals** (Oral Session)
**Chair:** Castiglioni, Paolo *(Fondazione Don Carlo Gnocchi ONLUS)*
**Co-Chair:** Lee, Jong-Ha *(Keimyung University, School of Medicine)*

**10:50-11:05**          FrBT18.1

**Characterization of Doctor-Patient Communication using Heartbeat Nonlinear Dynamics: A Preliminary Study using Lagged Poincaré Plots**

Nardelli, Mimma *(Univ. of Pisa)*; Del Piccolo, Lidia *(Univ. of Verona)*; Danzi, Olivia Purnima *(Univ. of Verona)*; Perlini, Cinzia *(Univ. of Verona)*; Tedeschi, Federico *(Univ. of Verona)*; Greco, Alberto *(Univ. of Pisa)*; Scilingo, Enzo Pasquale *(Univ. of Pisa)*; Valenza, Gaetano* *(Univ. of Pisa)*

**11:05-11:20**          FrBT18.2

**Multifractal Multiscale DFA of Cardiovascular Time Series: Differences in Complex Dynamics of Systolic Blood Pressure, Diastolic Blood Pressure and Heart Rate**

Castiglioni, Paolo* *(Fondazione Don Carlo Gnocchi ONLUS)*; Lazzeroni, Davide *(Fondazione Don Carlo Gnocchi, Parma, Italy)*; Brambilla, Valerio *(Fondazione Don Carlo Gnocchi, Parma, Italy)*; Coruzzi, Paolo *(Dept. of Clinical and Experimental Medicine)*; Faini, Andrea *(Istituto Auxologico Italiano)*

**11:20-11:35**          FrBT18.3

**Cardiovascular and Respiratory Variability during Orthostatic and Mental Stress: A Comparison of Entropy Estimators**

Valente, Martina *(University of Trento)*; Javorka, Michal *(Comenius University, Jessenius Faculty of Medicine)*; Turianikova, Zuzana *(Dept. of Physiology, Comenius University, Jessenius Faculty)*; Czippelova, Barbora *(Dept. of Physiology, Comenius University, Jessenius Faculty)*; Krohova, Jana *(Comenius University in Bratislava)*; Nollo, Giandomenico *(University of Trento)*; Faes, Luca* *(University of Trento)*

**11:35-11:50**          FrBT18.4

**Secondary Measures of Regularity from an Entropy Profile in Detecting Arrhythmia**

Udhayakumar, Radhagayathri* *(University of Melbourne)*; Karmakar, Chandan *(Deakin University)*; Palaniswami, Marimuthu *(The University of Melbourne)*

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**11:50-12:05**          FrBT18.5

**Multivariate Symbolic Dynamics for Analysis of Respiratory-Cardiovascular Interactions**

Reulecke, Sina *(Univ. Autónoma Metropolitana)*; Charleston-Villalobos, Sonia* *(Univ. Autonoma Metropolitana)*; Voss, Andreas *(Univ. of Applied Sciences Jena)*; Gonzalez-Camarena, Ramon *(Univ. Autonoma Metropolitana)*; Gaitan-Gonzalez, Mercedes *(Univ. Autonoma Metropolitana)*; Gonzalez-Hermosillo, Jesus Antonio *(Instituto Nacional de Cardiología)*; Hernandez-Pacheco, Guadalupe *(Instituto Nacional de Cardiologia "Ignacio Chavez")*; Aljama-Corrales, Tomas *(Univ. Autonoma Metropolitana)*

**12:05-12:20**          FrBT18.6

**Nonlinear Dynamic Analysis of the Cardiorespiratory System in Patients Undergoing the Weaning Process**

Arizmendi, Carlos *(Univ. Autonoma de Bucaramanga)*; Trapero, Jose Ignacio *(Univ. Autonoma de Bucaramanga)*; Gonzalez Acevedo, Hernando *(Univ. Autónoma de Bucaramanga)*; Forero, Carlos Adolfo *(Univ. Autonoma de Bucaramanga)*; Giraldo, Beatriz* *(Universitat Poiltècnica de Catalunya)*

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**FrCT1:** 14:20-15:50          Roentgen Hall
**Signal Pattern Classification – Cardiovascular Signals I** (Oral Session)
**Chair:** Wu, Shun Chi *(National Tsing Hua University)*
**Co-Chair:** Kim, Kiwoong *(Korea Research Institute of Standards and Science)*

**14:20-14:35**          FrCT1.1

**A Cancelable Biometric Scheme based on Multi-Lead ECGs**

Chen, Peng-Tzu *(National Tsing Hua University)*; Wu, Shun Chi* *(National Tsing Hua University)*; Hsieh, Jui Hsuan *(National Tsing Hua University)*

**14:35-14:50**          FrCT1.2

**Adaptive Fourier Decomposition based R-Peak Detection for Noisy ECG Signals**

Wang, Ze *(Faculty of Science & Tech, Univ. of Macau)*; Wong, Chi Man *(Univ. of Macau)*; Wan, Feng* *(Univ. of Macau)*

**14:50-15:05**          FrCT1.3

**A Robust Automatic Mechanism for Electrocardiogram Interpretation in Telehealthcare**

Ho, Te-Wei* *(National Taiwan University)*; Lai, Feipei *(National Taiwan University)*

**15:05-15:20**          FrCT1.4

**Designing ECG-Based Physical Unclonable Function for Security of Wearable Devices**

Yin, Shihui* *(Arizona State University)*; Bae, ChiSung *(Samsung Advanced Institute of Technology)*; Kim, Sang Joon *(Samsung Electronics)*; Seo, Jae-sun *(Arizona State University)*

**15:20-15:35**          FrCT1.5

**A Body Position Influence on ECG Derived Respiration**

Przystup, Piotr *(Gdansk Univ. of Technology)*; Polinski, Artur *(Gdansk Univ. of Technology)*; Wtorek, Jerzy* *(Gdansk Univ. of Technology)*; Bujnowski, Adam *(Gdansk Univ. of Technology)*; Kocejko, Tomasz *(Gdansk Univ. of Technology)*

**15:35-15:50**          FrCT1.6

**Analysis of PAM Clustering Accuracy for Cardiac Signals Classification**

kianimajd, Adell *(University of Algarve)*; Ruano, M. Graça* *(FCT, University of Algarve & CISUC-University of Coimbra)*; de Carvalho, Paulo *(University of Coimbra)*; Henriques, Jorge *(University of Coimbra)*; Rocha, Teresa *(Inst Superior de Eng de Coimbra)*; Ruano, Antonio *(University of Algarve)*

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**FrCT2:** 14:20-15:50          Cho Room
**Recent Advances in Ultrasound Medical Imaging** (Invited Session)
**Chair:** Yoo, Yangmo *(Sogang University)*
**Co-Chair:** Kim, Hyung Ham *(Pohang Univ. of Science and Tech.)*

**14:20-14:35**          FrCT2.1

**Ultrasound and Photoacoustic Multimodality Imaging using Laser-Activated Perfluorocarbon Nanodroplets**

Yoon, Changhan* *(Inje University)*

**14:35-14:50**　　　　　　　　　　　　　　　　　　FrCT2.2
**Advances in Ultrasound Imaging: Multi-Modality Fusion Imaging**
Managuli, Ravi* *(Hitachi Aloka Medical America, Inc.)*

**14:50-15:05**　　　　　　　　　　　　　　　　　　FrCT2.3
**Ultrasound-Assisted Photothermal Therapy**
Chang, Jin Ho* *(Sogang University)*

**15:05-15:20**　　　　　　　　　　　　　　　　　　FrCT2.4
**A New Three-Dimensional Automated Breast Ultrasound Imaging System for Women with Dense Breast**
Yoo, Yangmo* *(Sogang University)*

**15:20-15:35**　　　　　　　　　　　　　　　　　　FrCT2.5
**Array Transducers for High Definition Ultrasound Imaging**
Kim, Hyung Ham* *(Pohang Univ. of Science and Technology)*

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**FrCT3: 14:20-15:50**　　　　　　　　　　　　　　Park Room
**Innovative MRI Method** (Oral Session)

**14:20-14:35**　　　　　　　　　　　　　　　　　　FrCT3.1
**White Matter Integrity Correlates with Choline Level in Dorsal Anterior Cingulate Cortex of Obsessive Compulsive Disorder Patients: A Combined DTI-MRS Study**
Wang, Ruilin *(Shanghai Jiao Tong Univ.)*; Fan, Qing *(Shanghai Mental Health Center, Shanghai Jiao Tong Univ. Sch)*; Zhang, Zongfeng *(Shanghai Mental Health Center, Shanghai Jiao Tong Univ. Sch)*; Chen, Yongjun *(Shanghai Mental Health Center, Shanghai Jiao Tong Univ. Sch)*; Tong, Shanbao *(Shanghai Jiao Tong Univ.)*; Li, Yao* *(Shanghai Jiao Tong Univ.)*

**14:35-14:50**　　　　　　　　　　　　　　　　　　FrCT3.2
**A 3D Model-Based Simulation of Demyelination to Understand Its Effects on Diffusion Tensor Imaging**
Salan, T.* *(Univ. of Memphis)*; Jacobs, E. *(Univ. of Memphis)*; Reddick, W. *(St. Jude Children's Research Hospital)*

**14:50-15:05**　　　　　　　　　　　　　　　　　　FrCT3.3
**Multi-View Collaborative Segmentation for Prostate MRI Images**
Wang, Xiu Ying *(The Univ. of Sydney)*; Tang, Wensi *(Univ. of Sydney)*; Cui, Hui* *(The Univ. of Sydney)*; Zeng, Shan *(Wuhan Polytechnic Univ.)*; Feng, Dagan *(The Univ. of Sydney)*; Fulham, Michael *(Royal Prince Alfred Hospital)*

**15:05-15:20**　　　　　　　　　　　　　　　　　　FrCT3.4
**A Portable, Low-Cost, 3D-Printed Main Magnetic Field System for Magnetic Imaging**
Kang, Iksung* *(Seoul National University)*

**15:20-15:35**　　　　　　　　　　　　　　　　　　FrCT3.5
**Accelerated Magnetic Resonance Spectroscopy with Vandermonde Factorization**
Qu, Xiaobo* *(Xiamen Univ.)*; Ying, Jiaxi *(Dept. of Electronic Science, Xiamen Univ.)*; Cai, Jian-Feng *(Dept. of Mathematics, Hong Kong Univ. of Science)*; Chen, Zhong *(Xiamen Univ.)*

**15:35-15:50**　　　　　　　　　　　　　　　　　　FrCT3.6
**A Novel 3D-Printed Mechanical Actuator using Centrifugal Force for Magnetic Resonance Elastography**
Neumann, Wiebke* *(Heidelberg Univ.)*; Schad, Lothar R. *(Heidelberg Univ.)*; Zöllner, Frank G. *(Heidelberg Univ.)*

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**FrCT4: 14:20-15:50**　　　　　　　　　　　　　　Min Room
**Body Sensor Networks – Molecules, Radio, and Machine Learning – III** (Invited Session)
**Chair:** Anzai, Daisuke *(Nagoya Institute of Technology)*
**Co-Chair:** Sugimachi, Masaru *(Natl Cardio Center Research Inst)*

**14:20-14:35**　　　　　　　　　　　　　　　　　　FrCT4.1
**An Improved Design of EEG Monitoring System with Dry Electrodes**
Lee, Seungchan *(Gwangju Institute of Science and Technology)*; Kumar, Anil *(Gwangju Institute of Science and Technology)*; Shin, Younghak *(NTNU (Norwegian University of Science and Technology))*; Lee, Heung-No* *(Gwangju Institute of Science and Technology (GIST))*

**14:35-14:50**　　　　　　　　　　　　　　　　　　FrCT4.2
**Percutaneous Auricular Vagus Nerve Stimulation: Assessment of Sensitivity of Neural Activation to Electrode Position**
Samoudi, Mohammed Amine* *(Ghent Univ./iMinds)*; Kampusch, Stefan *(Vienna Univ. of Technology)*; Tanghe, Emmeric *(Ghent Univ.)*; Szeles, Constantin *(Univ. Clinic for Surgery, Vienna General Hospital, Medical)*; Martens, Luc *(iMinds / Ghent Univ.)*; Kaniusas, Eugenijus *(Vienna Univ. of Technology)*; Joseph, Wout *(Ghent Univ.)*

**14:50-15:05**　　　　　　　　　　　　　　　　　　FrCT4.3
**Molecular Communications for Cardiomyocytes**
Lu, Pengfei* *(University of Oslo and Oslo University Hospital)*; Bose, Pritam *(University of Oslo and Oslo University Hospital)*; Albatat, Mohammad *(University of Oslo and Oslo University Hospital)*; Balasingham, Ilangko *(Oslo University Hospital and Norwegian University of Science and)*

**15:05-15:20**　　　　　　　　　　　　　　　　　　FrCT4.4
**A Contact-Less Heart Rate Sensor System for Driver Health Monitoring**
Izumi, Shintaro* *(Kobe Univ.)*; Matsunaga, Daichi *(Kobe Univ.)*; Nakamura, Ryota *(Kobe Univ.)*; Kawaguchi, Hiroshi *(Kobe Univ.)*; Yoshimoto, Masahiko *(Kobe Univ.)*

**15:20-15:35**　　　　　　　　　　　　　　　　　　FrCT4.5
**Monitoring of Cardiac Diseases by use of a Wearable Sensor Platform with Capacitive ECG**
Kirchner, Jens* *(University of Erlangen-Nuremberg)*; Fischer, Georg *(University of Erlangen-Nuremberg)*

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**FrCT5: 14:20-15:50**　　　　　　　　　　　　　　Lee Room
**Wearable Sensors and Systems II** (Oral Session)
**Chair:** Kang, Hongki *(KAIST)*

**14:20-14:35**　　　　　　　　　　　　　　　　　　FrCT5.1
**Inkjet-Printed Gold Nanorods using Biocompatible Polyelectrolyte Layer-by-Layer Coating for Patterned Photothermal Applications**
Kang, Hongki* *(KAIST)*; Lee, Gu-Haeng *(KAIST)*; Nam, Yoonkey *(Korea Advanced Inst. of Science and Technology)*

**14:35-14:50**　　　　　　　　　　　　　　　　　　FrCT5.2
**A System for Finger Tremor Quantification in Patients with Parkinson's Disease**
Bravo Guamán, Marco Fernando* *(Universidad Politécnica Salesiana)*; Bermeo Maldonado, Alexander Vinicio *(Universidad Politécnica Salesiana)*; Huerta, Mónica *(Simon Bolivar University)*; Llumiguano, Carlos *(Universidad San Francisco and Vozandes Hospital)*; Bermeo, Juan Pablo *(Universidad Politécnica Salesian)*; Clotet, Roger *(Simón Bolívar University)*; Soto, Angel *(Universidad Politécnica Salesiana)*

**14:50-15:05**　　　　　　　　　　　　　　　　　　FrCT5.3
**Robust Motion Artefact Resistant Circuit for Calculation of Mean Arterial Pressure from Pulse Transit Time**
Bhattacharya, Tinish *(Indian Institute of Tech. Delhi)*; Gupta, Ankesh* *(Indian Institute of Tech. Delhi)*; Singh, Thoithoi *(Indian Institute of Tech. Delhi)*; Roy, Sitikantha *(Indian Institute of Tech. Delhi)*; Prasad, Anamika *(South Dakota State)*

**15:05-15:20**　　　　　　　　　　　　　　　　　　FrCT5.4
**A Wearable, EEG-Based Massage Headband for Anxiety Alleviation**
Nair, Chaitanya Muralidharan* *(National Univ. of Singapore)*

**15:20-15:35**　　　　　　　　　　　　　　　　　　FrCT5.5
**TongueToSpeech (TTS): Wearable Wireless Assistive Device for Augmented Speech**
Marjanovic, Nicholas* *(Univ. of Illinois, Chicago)*; Piccinini, Giacomo *(Univ. of Illinois, Chicago)*; Kerr, Kevin *(Univ. of Illinois-Chicago)*; Esmailbeigi, H. *(Univ. of Illinois, Chicago)*

**15:35-15:50**　　　　　　　　　　　　　　　　　　FrCT5.6
**One Size Fits All Electronics for Insole-Based Activity Monitoring**
Hegde, Nagaraj *(The Univ. of Alabama)*; Bries, Matthew *(The Univ. of Alabama)*; Melanson, Ed *(Univ. of Colorado at Denver)*; Sazonov, Edward* *(Univ. of Alabama)*

**Cell and Protein Interaction with External Fields I** (Oral Session)

14:20-14:35            FrCT6.1
**Electrical Bioimpedance Spectroscopy as Biosensor Technique to Identify Cells Lineages and Cell Differentiation Process**
Guerrero Robles, Carla* *(Instituto Politécnico Nacional)*; Vázquez Zapién, Gustavo Jesús *(Escuela Médico Militar)*; Mata Miranda, Mónica Maribel *(Escuela Médico Militar)*; Noriega González, Jesús Enmanuel *(Escuela Médico Militar)*; Gonzalez, Cesar *(Universidad del Ejercito y Fuerza Aerea)*

14:35-14:50            FrCT6.2
**Finite-Element Modelling and Preliminary Validation of Microneedle-Based Electrodes for Enhanced Tissue Electroporation**
Houlihan, Ruth *(Tyndall Natl. Institute, Univ. College Cork)*; Grygoryev, Konstantin *(Tyndall Natl. Institute, Univ. College Cork)*; Ning, Zhenfei *(School of Biochemistry & Cell Biology, Univ. College Cork)*; Williams, John Michael *(School of Biochemistry & Cell Biology, Univ. College Cork)*; Moore, Tom *(School of Biochemistry & Cell Biology, Univ. College Cork)*; O'Mahony, Conor* *(Tyndall Natl. Institute, Univ. College Cork)*

14:50-15:05            FrCT6.3
**EM Fields Comparison between Planar vs. Solenoidal uMS Coil Designs for Nerve Stimulation**
Bonmassar, Giorgio* *(A. A. Martinos Ctr. for Biomedical Imaging)*; Golestanirad, Laleh *(University of Toronto)*

15:05-15:20            FrCT6.4
**Design and Construction of a Synthetic E. Coli Protease Inhibitor Detecting Biomachine**
Boonyalekha, Phenbunya *(King Mongkut's Univ. of Tech. Thonburi)*; Meechai, Asawin *(King Mongkut's Univ. of Tech. Thonburi)*; Waraho-Zhmayev, Dujduan* *(King Mongkut's Univ. of Tech. Thonburi)*; Tayapiwatana, Chatchai *(Chiang Mai Univ.)*; Kitidee, Kuntida *(Chiang Mai Univ.)*

15:20-15:35            FrCT6.5
**Determination of Red Blood Cell Fatigue using Electrodeformation**
Amirouche, Amin* *(Institut des Nanotechnologies de Lyon)*; Faivre, Magalie *(Institut des Nanotechnologies de Lyon)*; Chateaux, Jean-François *(Université Lyon1 Claude Bernard)*; Ferrigno, Rosaria *(Université Claude Bernard Lyon 1)*

15:35-15:50            FrCT6.6
**Analysis of Dielectrophoresis based 3D-Focusing in Microfluidic Devices with Planar Electrodes**
Hilal-Alnaqbi, ali *(united arab emirates University)*; Alazzam, Anas *(Khalifa University)*; Dagher, Sawsan *(UAE University)*; Mathew, Bobby* *(UAE University)*

15:35-15:50            FrCT6.7
**Effect of Laser Diode Light Irradiation on Growth Capability of Human Hair Follicle Dermal Papilla Cells**
Jampa-ngern, Sira *(King Mongkut's University of Technology Thonburi)*; Khantachawana, Anak* *(King Mongkut's University of Technology Thonburi)*; Viravaidya-Pasuwat, Kwanchanok *(King Mongkut's University of Technology, Thonburi)*; Suvanasuthi, Saroj *(Samitivej Sukhumvit Hospital)*

**EEG and Electrical Source Imaging** (Oral Session)

14:20-14:35            FrCT8.1
**Gamma-Variate Modeling of Indicator Dilution Curves in Electrical Impedance Tomography**
Hentze, Benjamin* *(RWTH Aachen University)*; Muders, Thomas *(Dept. of Anaesthesiology and Intensive Care Medicine, Univ.)*; Luepschen, Henning *(RWTH Aachen University)*; Leonhardt, Steffen *(RWTH Aachen University)*; Putensen, Christian *(Dept. of Anaesthesiology and Intensive Care Medicine)*; Walter, Marian *(RWTH Aachen University)*

14:35-14:50            FrCT8.2
**Localization of Stereoelectroencephalography Signals using a Finite Difference Complete Electrode Model**
Hyde, Damon* *(Boston Children's Hospital and Harvard Medical School)*; Tomas-Fernandez, Xavier *(Harvard University)*; Stone, Scellig *(Boston Children's Hospital and Harvard Medical School)*; Peters, Jurriaan *(Boston Children's Hospital)*; Warfield, Simon K. *(Harvard Medical School)*

14:50-15:05            FrCT8.3
**ICA on Sensor or Source Data: A Comparison Study in Deriving Resting State Networks from EEG**
Li, Chuang *(University of Oklahoma)*; Yuan, Han *(University of Oklahoma)*; Urbano, Diamond *(Laureate Institute for Brain Research)*; Cha, Yoon-Hee *(Laureate Institute of Brain Research)*; Ding, Lei* *(University of Oklahoma)*

15:05-15:20            FrCT8.4
**Spatial Regularization based on dMRI to Solve EEG/MEG Inverse Problem**
Belaoucha, Brahim* *(Université Côte d'Azur, Inria)*; Papadopoulo, Théodore *(INRIA Sophia-Antipolis)*

15:20-15:35            FrCT8.5
**EEG Fluctuations of Wake and Sleep in Mild Cognitive Impairment**
O'Keeffe, Johnny *(The Univ. of Oklahoma)*; Carlson, Barbara *(The Univ. of Oklahoma)*; DeStefano, Lisa *(The Univ. of Oklahoma)*; Wenger, Michael *(Univ. of Oklahoma)*; Craft, Melissa *(The Univ. of Oklahoma)*; Hershey, Linda *(The Univ. of Oklahoma)*; Hughes, Jeremy *(The Univ. of Oklahoma)*; Wu, Dee *(Univ of Oklahoma Health Sciences)*; Ding, Lei *(Univ. of Oklahoma)*; Yuan, Han* *(Univ. of Oklahoma)*

15:35-15:50            FrCT8.6
**Computation of Surface Laplacian for Tri-Polar Ring Electrodes on High-Density Realistic Geometry Head Model**
Ma, Junwei* *(Univ. of Oklahoma)*; Yuan, Han *(Univ. of Oklahoma)*; Sunderam, Sridhar *(Univ. of Kentucky)*; Besio, W. G. *(Univ. of Rhode Island)*; Ding, Lei *(Univ. of Oklahoma)*

**Neural Signal Processing II** (Oral Session)
**Chair:** Wheeler, Bruce *(University of Florida)*

14:20-14:35            FrCT9.1
**Independent Component Analysis-Based Spatial Filtering Improves Template-Based SSVEP Detection**
Nakanishi, Masaki* *(University of California San Diego)*; Wang, Yijun *(Institute of Semiconductors, Chinese Academy of Sciences)*; Hsu, Sheng-Hsiou *(University of California, San Diego)*; Wang, Yu-Te *(University of California San Diego)*; Jung, Tzyy-Ping *(University of California San Diego)*

14:35-14:50            FrCT9.2
**Using Monkey Hand Exoskeleton to Explore Finger Passive Joint Movement Response in Primary Motor Cortex**
Qian, Kai* *(Illinois Institute of Technology)*; Antonio dos Anjos Jr., Luiz *(Illinois Institute of Chicago)*; Balasubramanian, Karthikeyan *(University of Chicago)*; Stilson, Kelsey *(The University of Chicago)*; Balcer, Carrie Anne *(University of Chicago)*; Hatsopoulos, Nicholas *(University of Chicago)*; Kamper, Derek *(Rehabilitation Institute of Chicago)*

14:50-15:05            FrCT9.3
**Specific CA3 Neurons Decode Neural Information of Dentate Granule Cells Evoked by Paired-Pulse Stimulation in Co-Cultured Networks**
Poli, Daniele *(Univ. of California, Irvine)*; DeMarse, Thomas B. *(Univ. of Florida)*; Wheeler, Bruce* *(Univ. of Florida)*; Brewer, Gregory *(Univ. of California Irvine, Southern Illinois Univ.)*

15:05-15:20            FrCT9.4
**Information Transmission in the Primary Visual Cortex of Retinal Degenerated Rats**
Wang, Yi* *(City University of Hong Kong)*; Chen, Ke *(University of Electronic Science and Technology of China)*; Chan, Leanne LH *(City University of Hong Kong)*

**15:20-15:35**  FrCT9.5
**Sparse Coding of ECoG Signals Identifies Interpretable Components for Speech Control in Human Sensorimotor Cortex**
Bouchard, Kristofer E.* *(LBNL)*; Bujan, Alejandro F *(UC Berkeley)*; Chang, Edward *(UCSF)*; Sommer, Friedrich *(University of California Berkeley)*

**15:35-15:50**  FrCT9.6
**A New EMG-Based Index towards the Assessment of Elbow Spasticity for Post-Stroke Patients**
Wang, Lei *(Shenzhen Institutes of Advanced Tech. Chinese Academy of Sc)*; Guo, Xin *(Hebei Univ. of Tech.)*; Fang, Peng *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Wei, Yue *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Samuel, Oluwarotimi Williams *(Shenzhen Institutes of Advanced Tech.)*; Huang, Pin-Gao *(Chinese Academy of Sciences)*; Geng, Yanjuan *(Shenzhen Institutes of Advanced Tech.)*; Wang, Hui* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Li, Guanglin *(Shenzhen Institutes of Advanced Tech.)*

**FrCT10: 14:20-15:50**  Schmitt Room
**General and Theoretical Informatics – Data Mining I** (Oral Session)
**Chair:** Fotiadis, Dimitrios I. *(University of Ioannina)*

**14:20-14:35**  FrCT10.1
**Gamaid: Greedy CP Tensor Decomposition for Supervised EHR-Based Disease Trajectory Differentiation**
Henderson, Jette *(The University of Texas at Austin)*; Ho, Joyce C.* *(Emory University)*; Ghosh, Joydeep *(Univ of Texas, Austin)*

**14:35-14:50**  FrCT10.2
**A Computational Approach for the Estimation of Heart Failure Patients Status using Saliva Biomarkers**
Tripoliti, Evanthia *(Univ. of Ioannina)*; Papadopoulos, Theofilos *(Unit of Medical Tech. & Intelligent Information Systems)*; Karanasiou, Georgia *(Institute of Molecular Biology & BioTech., FORTH, Ioannin)*; Kalatzis, Fanis *(Dept. of Biomedical Research, Institute of Molecular Biology)*; Goletsis, Yorgos *(Univ. of Ioannina)*; Bechlioulis, Aris *(Michaelidion Cardiac Center, Univ. of Ioannina, & 2nd Dep)*; Ghimenti, Silvia *(Univ. of Pisa)*; Lomonaco, Tommaso *(Univ. of Pisa)*; Bellagambi, Francesca *(Univ. of Pisa)*; Trivella, Maria G. *(Istituto di Fisiologia Clinica-CNR, Pisa)*; Fuoco, Roger *(Univ. of Pisa)*; Marzilli, Mario *(Azienda Ospedaliera-Universitaria Pisana, Cardiothoracic & Vas)*; Scali, Maria Chiara *(Azienda Ospedaliera-Universitaria Pisana, Cardiothoracic & Vas)*; Naka, Katerina *(Univ. of Ioannina)*; Abdelhamid, Errachid *(Univ. de Lyon, Institut de Sciences Analytiques (ISA))*; Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

**14:50-15:05**  FrCT10.3
**Exploration of Unsupervised Feature Selection Methods to Predict Chronological Age of Individuals by Utilising CpG Dinucleotics from Whole Blood**
Sarac, Ferdi *(Northumbria University at Newcastle)*; Seker, Huseyin* *(The University of Northumbria at Newcastle)*; Bouridane, Ahmed *(Northumbria University)*

**15:05-15:20**  FrCT10.4
**Wrapper Method for Feature Selection to Classify Cardiac Arrhythmia**
Mustaqeem, Anam *(Univ. of Engineering and Technology, Taxila)*; Anwar, Syed* *(Univ. of Engineering and Technology)*; Majid, Muhammad *(Univ. of Engineering and Technology, Taxila)*; Khan, Abdul Rashid *(POF Hospital, Wah Cantt.)*

**15:20-15:35**  FrCT10.5
**Prediction and Imputation in Irregularly Sampled Clinical Time Series Data using Hierarchical Linear Dynamical Models**
Sengupta, Abhishek *(Walmart Labs India)*; Ap, Prathosh *(Xerox Research Centre India)*; Shukla, Satya Narayan *(University of Massachusetts Amherst)*; Rajan, Vaibhav *(Yen4Ken Software Pvt. Ltd.)*; Reddy, Chandan K *(Virginia Tech)*; Shukla, Satya Narayan* *(University of Massachusetts Amherst)*

**15:35-15:50**  FrCT10.6
**Identifying Frauds and Anomalies in Medicare-B Dataset**
Seo, Jiwon* *(UNIST)*; Mendelevitch, Ofer *(LendUp.com)*

**FrCT11: 14:20-15:50**  Greatbatch Room
**Models of Cardiac Function and Blood Flow** (Oral Session)

**14:20-14:35**  FrCT11.1
**A Computational Model of Myocardial Microcirculation including Interstitial Flow**
Shimayoshi, Takao* *(Kyushu University)*; Yamamoto, Yuta *(Kyoto University)*; Matsuda, Tetsuya *(Kyoto University)*

**14:35-14:50**  FrCT11.2
**PWPSim: A New Simulation Tool of Pulse Wave Propagation in the Human Arterial Tree**
Xiao, Hanguang *(Chongqing University of Technology)*; Butlin, Mark *(Macquarie University)*; Tan, Isabella *(Macquarie University)*; Avolio, Alberto P* *(Macquarie University)*

**14:50-15:05**  FrCT11.3
**Global Sensitivity Analysis for Developing Biological Models: Application to K+ Channel Model in Mouse Ventricular Myocytes**
Du, Dongping* *(Texas Tech University)*; Du, Yuncheng *(Clarkson University)*

**15:05-15:20**  FrCT11.4
**A Generic Cardiac Biventricular Fluid-Electromechanics Model**
Ahmad Bakir, Azam *(The Univ. of New South Wales)*; Al Abed, Amr *(Univ. of New South Wales)*; Lovell, Nigel H. *(Univ. of New South Wales)*; Dokos, Socrates* *(Univ. of New South Wales)*

**15:20-15:35**  FrCT11.5
**Effects of Island-Distribution of Mid-Cardiomyocytes on Ventricular Electrical Excitation Associated with the KCNQ1-Linked Short QT Syndrome**
Luo, Cunjin* *(Harbin Institute of Tech., School of Computer Science and T)*; Wang, Kuanquan *(Harbin Institute of Tech.)*; Zhang, Henggui *(Harbin Institute of Tech., School of Computer Science and T)*; Zhang, Yue *(Harbin Engineering Univ.)*

**15:35-15:50**  FrCT11.6
**Hyperthermia Dependence of Cardiac Conduction Velocity in Rat Myocardium: Optical Mapping and Cardiac Near Field Measurements**
Pollnow, Stefan* *(Karlsruhe Institute of Technology)*; Arnold, Robert *(Medical University of Graz, Austria)*; Werber, Matthias *(Karlsruhe Institute of Technology (KIT))*; Doessel, Olaf *(Karlsruhe Institute of Technology (KIT))*; Seemann, Gunnar *(University Heart Center Freiburg - Bad Krozingen)*

**FrCT13: 14:20-15:50**  Dunn Room
**Contemporary Diagnostic Devices in Traditional Eastern Medicine: Overview of the Research Activities at KIOM** (Minisymposium)
**Chair:** Kim, Jaeuk U *(Korean Institute of Oriental Medicine)*

**14:20-14:35**  FrCT13.1
**Biofield Research and Exogenous Features of Bioelectricity**
Kim, Jaeuk U* *(Korean Institute of Oriental Medicine)*; Jun, Min-Ho *(KIOM)*; Bae, Jang-Han *(Korea Institute of Oriental Medicine, KAIST)*; Ku, Boncho *(Korea Institute of Oriental Medicine (KIOM))*; Kim, Jungyoon *(Korea Institute of Oriental Medicine)*

**14:35-14:50**  FrCT13.2
**Development of 3D Asymmetry Analysis System for Human Body Shape**
Jang, Jun-Su* *(Korea Institute of Oriental Medicine)*

**14:50-15:05**  FrCT13.3
**Classification of Upper Respiratory Tract Infection Patients by Tongue Image Analysis**
Choi, Woosu *(Korea Institute of Oriental Medicine)*; Kim, Keun Ho* *(Korea Institute of Oriental Medicine)*

**15:05-15:20**  FrCT13.4
**A Novel Pulse Waveform Analysis System for Radial Artery Pulse Diagnosis in Oriental Medicine**
Jeon, Youngju* *(Korean Institute of Oriental Medicine)*; Kim, Young-Min *(Korea Institute of Oriental Medicine)*; Kim, Jong Yeol *(Korea Institute of Oriental Medicine)*; Kim, Jaeuk U *(Korea Institute of Oriental Medicine)*

**15:20-15:35**                                    FrCT13.5
**Development of Phenotype Measurement and Analysis System for Constitution-Specific Treatment**
Do, Jun-Hyeong* *(Korea Institute of Oriental Medicine)*; Jang, Jun-Su *(Korea Institute of Oriental Medicine)*; Kim, Young-Min *(Korea Institute of Oriental Medicine)*

**15:35-15:50**                                    FrCT13.6
**A Study on the Development of the Abdomen Diagnosis Devices based on Korean Medicine for Functional Dyspepsia**
Kim, Keun Ho* *(Korea Institute of Oriental Medicine)*; Lee, Sanghun *(Korea Institute of Oriental Medicine)*

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**FrCT14: 14:20-15:50**                         Schaldach Room
**Image Rendering and Enhancement** (Oral Session)
**Chair:** Lepore, Natasha *(University of Southern California / Children's Hospital Los Angeles)*

**14:20-14:35**                                    FrCT14.1
**An Enhanced Hybrid Tracking-Mosaicking Approach for Surgical View Expansion**
Takada, Chisato* *(Chiba Univ.)*; Afifi, Ahmed *(Chiba Univ.)*; Suzuki, Toshiyuki *(Chiba Univ.)*; Nakaguchi, T. *(Chiba Univ.)*

**14:35-14:50**                                    FrCT14.2
**A Low-Dimensional Representation for Individual Head Geometries**
Miklody, Daniel* *(Technische Universität Berlin)*; Bagdasarian, Milena Teresa *(Technische Universität Berlin, Fraunhofer HHI)*; Blankertz, Benjamin *(Technische Universität Berlin)*

**14:50-15:05**                                    FrCT14.3
**GPU-Based Volume Reconstruction for Freehand 3D Ultrasound Imaging**
Wen, Tiexiang* *(Shenzhen Institutes of Advanced Technology, Chinese Academy)*; Liu, Lei *(Shenzhen Institutes of Advanced Technology, Chinese Academy)*; Qin, Wenjian *(Shenzhen Institutes of Advanced Technology, Chinese Academy)*; Gu, Jia *(Shenzhen Inst of Advanced Technology)*

**15:05-15:20**                                    FrCT14.4
**BrainWatch Software for Interactive Exploration of Brain Scans in 3D Virtual Reality Systems**
Taswell, S. Koby *(Brain Health Alliance)*; Veeramacheneni, Teja *(Brain Health Alliance)*; Taswell, Carl* *(Brain Health Alliance)*

**15:20-15:35**                                    FrCT14.5
**Image Recognition of Triangular Tissue of an Organ Pulled by Forceps in Surgical Working Area for Laparoscope Robot**
Nakasuji, Hisa* *(Osaka Institute of Technology)*; Naruki, Kazuki *(Osaka Institute of Technology)*; Kawai, Toshikazu *(Osaka Institute of Technology)*; Nishikawa, Atsushi *(Shinshu Univ.)*; Nishizawa, Yuji *(Dept. of Gastroenterological Surgery, Faculty of Medicine)*; Nakamura, Tatsuo *(Kyoto Univ.)*

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**FrCT15: 14:20-15:50**                         Webster Room
**Medical Technology – Clinical Testing** (Oral Session)

**14:20-14:35**                                    FrCT15.1
**Cardiac Safety Profile for Random Complex Waveforms**
Pratt, Hugh *(CPLSO)*; Andrews, Chris *(Univ. of Queensland)*; Panescu, Dorin* *(Advanced Cardiac Therapeutics)*; Lake, Blossom *(Shrewsbury and Telford Hospital)*

**14:35-14:50**                                    FrCT15.2
**Development of Respiratory Function Monitor for Neonates**
Takatori, Fumihiko* *(Nihon Kohden Corp.)*; Inoue, Shinichiro *(Nihon Kohden Corp.)*; Togo, Satoru *(Nihon Kohden Corp.)*; Yamamori, Shinji *(Nihon Kohden Corp.)*

**14:50-15:05**                                    FrCT15.3
**Transmission Delay Performance in Telemedicine: A Case Study**
Wang, Gang* *(University of Connecticut)*; Lin, Shan *(Stony brook University)*; Mullen-Fortino, Margaret *(University of Pennsylvania)*; Sokolsky, Oleg *(University of Pennsylvania)*; Lee, Insup *(University of Pennsylvania)*

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**15:05-15:20**                                    FrCT15.4
**A Novel Platform for Distributed and Remote Real-Time Monitoring of Animal Model Behavior in a Bioterium**
Manso, A. *(Insituto Superior Técnico, Univ. de Lisboa)*; Martinho, M. *(Inst. Superior Técnico, Univ. de Lisboa)*; Plácido da Silva, H.* *(IST - Inst. Superior Técnico)*; Silvério Cabrita, A. *(Coimbra Chemistry Center, Univ. of Coimbra)*; Banganho, A.F. *(Inst. Politécnico de Coimbra, ISEC)*; Machado, G. *(Isec)*; Macedo, Mi. *(IPC - ISEC and LIBPhys)*

**15:20-15:35**                                    FrCT15.5
**Iquant™ Analyser: A Rapid Quantitative Immunoassay Reader**
Joseph, Jayaraj* *(HTIC, Indian Institute of Tech. Madras)*; Vasan, Jayaraman Kiruthi *(Healthcare Tech. Innovation Center)*; Shah, Malay Ilesh *(Healthcare Tech. Innovation Center (HTIC), Indian Institute)*; Sivaprakasam, Mohanasankar *(Indian Institute of Tech. Madras)*; Mahajan, Lalit *(J Mitra & Co Pvt. Ltd.)*

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**FrCT16: 14:20-15:50**                         Rushmer Room
**Advanced Robotic Surgery based on Deep Tissue Imaging and Haptic Feedback Technology** (Minisymposium)
**Chair:** Kim, Chulhong *(Pohang Univ. of Science and Technology)*

**14:20-14:35**                                    FrCT16.1
**Dermoscopy Guided Dark-Field Multi-Functional Optical Coherence Tomography**
Kwon, Soonjae *(POSTECH)*; Yoon, Yeoreum *(POSTECH)*; Kim, Bumju *(POSTECH)*; Jang, Won Hyuk *(POSTECH)*; Oh, Byungho *(Keimyung University, College of Medicine)*; Chung, Kee Yang *(Severance Hospital, Cutaneous Biology Research Institute)*; Kim, Ki Hean* *(POSTECH)*

**14:35-14:50**                                    FrCT16.2
**in Vivo Vasculature Imaging with a Clinical Photoacoustic and Ultrasound Imaging System**
Kim, Jeesu *(POSTECH)*; Park, Eunyeong *(Pohang University of Science and Tech. (POSTECH))*; Choi, Wonseok *(Pohang University of Science and Tech. (POSTECH))*; Kim, Chulhong* *(Pohang University of Science and Tech.)*

**14:50-15:05**                                    FrCT16.3
**Reconfigurable DRE Simulator using Augmented Haptics**
Talhan, Aishwari *(Kyung Hee University,)*; Jeon, Seokhee* *(Kyung Hee University)*

**15:05-15:20**                                    FrCT16.4
**Dielectro-Optofluidic Lens for Dynamic Focusing of Biomedical Imaging Techniques**
Kim, Wonkyoung *(Pohang University of Science and Tech. (POSTECH))*; Park, Sang Min *(Pohang University of Science and Tech. (POSTECH))*; An, Seonga *(Pohang University of Science and Tech. (POSTECH))*; Yoo, Jaewon *(Pohang University of Science and Tech. (POSTECH))*; Kim, Dong Sung* *(Pohang University of Science and Tech. (POSTECH))*

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**FrCT17: 14:20-15:50**                         Einthoven Hall
**Signal Processing – Sleep Analysis** (Oral Session)

**14:20-14:35**                                    FrCT17.1
**Snore Sound Recognition: On Wavelets and Classifiers from Deep Nets to Kernels**
Qian, Kun *(Technical Univ. of Munich)*; Janott, Christoph *(Technical Univ. of Munich)*; Jun, Deng *(Univ. of Passau)*; Heiser, Clemens *(Technical Univ. of Munich)*; Hohenhorst, Winfried *(Alfried Krupp Krankenhaus)*; Herzog, Michael *(Carl-Thiem-Klinikum Cottbus)*; Cummins, Nicholas* *(Univ. of Passau)*; Schuller, Bjoern *(Univ. of Passau)*

**14:35-14:50**                                    FrCT17.2
**A Bayesian Neural Network Approach to Compare the Spectral Information from Nasal Pressure and Thermistor Airflow in the Automatic Sleep Apnea Severity Estimation**
Gutierrez, Gonzalo Cesar* *(Univ. of Valladolid)*; de Frutos, Julio *(Hospital Univ. Río Hortega de Valladolid)*; Álvarez, Daniel *(Univ. of Valladolid)*; Vaquerizo-Villar, F. *(Biomedical Eng. Group, Univ. of Valladolid)*; Barroso-García, V. *(Biomedical Eng. Group, E.T.S.I. de Telecomunicación, Univ)*; Crespo, A. *(Hospital Univ. Rio Hortega, Valladolid)*; del Campo, F. *(Hospital del Río Hortega. Univ. de Valladolid)*; Hornero, R. *(Univ. of Valladolid)*

**14:50-15:05**　　　　　　　　　　　　　　　　　FrCT17.3

**Estimation of a Priori Probabilities of Sleep Stages: A Cycle-Based Approach**

Tataraidze, Alexander* *(Bauman Moscow State Technical Univ.)*; Anishchenko, Lesya *(BMSTU)*; Korostovtseva, Lyudmila *(Federal North-West Medical Research Centre)*; Bochkarev, Mikhail *(Federal North-West Medical Research Centre)*; Sviryaev, Yurii *(Sleep Lab, Federal Almazov Medical Research Centre)*; Ivashov, Sergey *(Bauman Moscow State Technical Univ.)*

**15:05-15:20**　　　　　　　　　　　　　　　　　FrCT17.4

**Comparing Two Insomnia Detection Models of Clinical Diagnostic Techniques**

Mulaffer, Lamana* *(Texas A&M Univ. at Qatar)*; Shahin, Mostafa *(Texas A&M Univ. at Qatar)*; Glos, Martin *(Charite-Univ. Berlin)*; Penzel, Thomas *(Charite Univ. Berlin)*; Ahmed, Beena *(Texas A&M Univ. at Qatar)*

**15:20-15:35**　　　　　　　　　　　　　　　　　FrCT17.5

**Usefulness of Discrete Wavelet Transform in the Analysis of Oximetry Signals to Assist in Childhood Sleep Apnea-Hypopnea Syndrome Diagnosis**

Vaquerizo-Villar, Fernando *(Biomedical Engineering Group, Univ. of Valladolid)*; Álvarez, Daniel *(Univ. of Valladolid)*; Gutierrez, Gonzalo Cesar *(Univ. of Valladolid)*; Barroso-García, Verónica *(Biomedical Engineering Group, E.T.S.I. de Telecomunicación, Univ)*; Kheirandish-Gozal, Leila *(Section of Sleep Medicine, Dept. of Pediatrics, Pritzker Sc)*; Crespo, Andrea *(Hospital Univ. Rio Hortega, Valladolid)*; del Campo, Félix *(Hospital del Río Hortega. Univ. de Valladolid)*; Gozal, David *(Section of Sleep Medicine, Dept. of Pediatrics, Pritzker Sc)*; Hornero, Roberto* *(Univ. of Valladolid)*

**15:35-15:50**　　　　　　　　　　　　　　　　　FrCT17.6

**Detecting Obstructive Sleep Apnea in Children by Self-Affine Visualization of Oximetry**

Garde, A.* *(Univ. of Twente)*; Kheirkhah Dehkordi, P. *(Univ. of British Columbia)*; Petersen, C. *(British Columbia Children's Hospital)*; Ansermino, J.M. *(British Columbia's Children's Hospital)*; Dumont, G. *(Univ. of British Columbia)*

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**FrCT18:**　14:20-15:50　　　　　　　　　Montgomery Hall
**Biomedical Data Beyond Linear Correlation: Higher Order Statistics and Non-Gaussianity, Non-Linearity and Multifractality** (Invited Session)
**Chair:**　Yamamoto, Yoshiharu *(The University of Tokyo)*
**Co-Chair:**　Abry, Patrice *(ENS Lyon, CNRS)*

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**14:20-14:35**　　　　　　　　　　　　　　　　　FrCT18.1

**Stochastic Quantifiers of Behavioral Dynamics in Psychiatric Disorders**

Nakamura, Toru* *(Osaka University)*; Yamamoto, Yoshiharu *(The University of Tokyo)*

**14:35-14:50**　　　　　　　　　　　　　　　　　FrCT18.2

**Long-Range Amplitude Correlations and Non-Gaussian Behavior of Heart Rate Variability**

Kiyono, Ken* *(Osaka Univ.)*; Miki, Yuki *(Osaka Univ.)*; Tsujimoto, Yutaka *(Graduate School of Engineering Science, Osaka Univ.)*; Watanabe, Eiichi *(Fujita Health Univ.)*; Hayano, Junichiro *(Nagoya City Univ.)*; Yamamoto, Yoshiharu *(The Univ. of Tokyo)*; Nomura, Taishin *(Osaka Univ.)*

**14:50-15:05**　　　　　　　　　　　　　　　　　FrCT18.3

**Feature Selection and Machine Learning based Supervised Classification for Intrapartum Fetal Acidosis Early Detection**

Abry, Patrice* *(ENS Lyon, CNRS)*; Leonarduzzi, R.F. *(Ecole Normale Superieure de Lyon)*; Spilka, J.*(Czech Tech. Univ. in Prague)*; Doret, M. *(Hospices Civils de Lyon Univ. Lyon I)*

**15:05-15:20**　　　　　　　　　　　　　　　　　FrCT18.4

**Multiscale Properties of Instantaneous Parasympathetic Activity in Severe Congestive Heart Failure: A Survivor vs Non-Survivor Study**

Valenza, Gaetano* *(Univ. of Pisa)*; Wendt, Herwig *(CNRS, Univ. of Toulouse)*; Kiyono, Ken *(Osaka Univ.)*; Hayano, Junichiro *(Nagoya City Univ.)*; Watanabe, Eiichi *(Fujita Health Univ.)*; Yamamoto, Yoshiharu *(The Univ. of Tokyo)*; Abry, Patrice *(ENS Lyon, CNRS)*; Barbieri, R. *(Politecnico di Milano)*

**15:20-15:35**　　　　　　　　　　　　　　　　　FrCT18.5

**Validation of Instantaneous Bispectral High-Frequency Power of Heartbeat Dynamics as a Marker of Cardiac Vagal Activity**

Valenza, Gaetano *(University of Pisa)*; Greco, Alberto *(University of Pisa)*; Scilingo, Enzo Pasquale *(University of Pisa)*; Barbieri, Riccardo* *(Politecnico di Milano)*

**15:35-15:50**　　　　　　　　　　　　　　　　　FrCT18.6

**Spatially Regularized Multifractal Analysis for fMRI Data**

Ciuciu, Philippe *(CEA)*; Wendt, Herwig* *(CNRS, University of Toulouse)*; Combrexelle, Sébastien *(IRIT, University of Toulouse)*; Abry, Patrice *(ENS Lyon, CNRS)*

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**FrDT1-01:**　16:10-17:10　　　　　　　　　　Roentgen Hall
**Neural Networks and Support Vector Machines in Biosignal Processing and Classification** (Poster Session)

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**16:10-16:12**　　　　　　　　　　　　　　　　　FrDT1-01.1

**Comparison of Methods for Motor Imaginary Classification by Neural Network in a Single Channel BCI**

Iwata, Yuuki* *(Waseda Univ.)*; Ishiyama, Atsushi *(Waseda Univ.)*

**16:12-16:14**　　　　　　　　　　　　　　　　　FrDT1-01.2

**Individualized Assessment of Cerebral Autoregulation in Patients with Intracranial Stenosis using Machine Learning**

Qiu, Quanli *(Chinese Academy of Sciences, Shenzhen Institutes of Advanced Tec)*; Zhang, Pandeng *(Chinese Academy of Sciences)*; Liu, Jia* *(Chinese Academy of Sciences)*

**16:14-16:16**　　　　　　　　　　　　　　　　　FrDT1-01.3

**Deception Detection Algorithm based on K-PCA and SVM**

Jang, Yurim *(Yonsei Univ.)*; Hwang, Layoung *(Yonsei Univ.)*; Kim, Heesong *(Natl. Forensic Service)*; Ji, Hyungki *(Natl. Forensic Service)*; Hong, Hyeongi *(Natl. Forensic Service)*; Kim, Kipyoung *(Natl. Forensic Service)*; Pyo, Chuyun *(Natl. Forensic Service)*; Shin, Taemin* *(Yonsei Univ.)*

**16:16-16:18**　　　　　　　　　　　　　　　　　FrDT1-01.4

**Detection of Game Craving in Young Individuals with Internet Gaming Addiction using Multiple Biosignals**

Kim, Hodam *(Hanyang University)*; Ha, Jihyeon *(Center for Bionics, Korea Institute of Science and Technology)*; Park, Wanjoo *(KIST)*; Kim, Laehyun *(Korea Institute of Science and Technology)*; Im, Chang-Hwan* *(Hanyang University)*

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**FrDT1-02:**　16:10-17:10　　　　　　　　　　Roentgen Hall
**Signal Pattern Classification** (Poster Session)

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**16:10-16:12**　　　　　　　　　　　　　　　　　FrDT1-02.1

**Attentional Spontaneous EEG Classification using Convolutional Neural Network (CNN)**

Liew, Siaw-Hong *(Universiti Teknikal Malaysia Melaka (UTeM))*; Low, Yin Fen* *(Universiti Teknikal Malaysia Melaka (UTeM))*; Lim, Kim Chuan *(UTeM)*; Choo, Yun-Huoy *(Universiti Teknikal Malaysia Melaka (UTeM))*

**16:12-16:14**　　　　　　　　　　　　　　　　　FrDT1-02.2

**A Method for Removing Effects of Electrode Impedance Imbalance and Muscle Fatigue on Hand Gesture Electromyogram Signals**

Jang, Seungwan *(Daelim Univ.)*; Seo, Ahyeon *(Daelim Univ.)*; Yang, Hansol *(Daelim Univ.)*; Lee, Deuk Yong *(Daelim Univ.)*; Yun, Yonghyeon* *(Daelim Univ. College)*

**16:14-16:16**　　　　　　　　　　　　　　　　　FrDT1-02.3

**Pilot Study of Cardiotocography**

Zhayida, Simayijiang* *(Lund University)*; Åström, Kalle *(Lund University)*; Källén, Karin *(Lund University Hospital)*

**16:16-16:18**　　　　　　　　　　　　　　　　　FrDT1-02.4

**Time-Varying Multivariate Risk-Stratification for Patients with Chronic Heart Failure**

O'Donnell, Johanna* *(Univ. of Oxford)*; Velardo, Carmelo *(Univ. of Oxford)*; Khorshidi, Reza *(Univ. of Oxford)*; Rahimi, Kazem *(Univ. of Oxford)*; Tarassenko, Lionel *(Univ. of Oxford)*

**16:18-16:20**                                                   FrDT1-02.5
**Preliminary Study: Drowsiness Detection using
Non-Contact ITO Film Glasses**
Choi, Sangho *(Seoul National University)*; Lee, Jeongsu *(Seoul National University)*; Hong, Seunghyeok *(Seoul National University)*; Kwon, Hyunbin *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

**16:20-16:22**                                                   FrDT1-02.6
**3-Phases of Cough Motor Act Analysis using
Accelerometer and Cough Sound**
Kim, Joo-Young *(Hanyang University)*; So, Soonwon *(Hanyang University)*; Yi, Ji Eun *(Biomedical Engineering Dept., University of Hanyang)*; Kim, In-Young* *(Hanyang University)*

**16:22-16:24**                                                   FrDT1-02.7
**ECG Quality Classification based on Similarity between
Segments Simultaneously Measured from Different Electrodes**
Kim, Yoon Jae *(Seoul National University)*; Heo, Jeong *(Seoul National University, Interdisciplinary Program for Bioengi)*; Kim, Myungjoon *(Interdisciplinary Program in Bioengineering, Seoul National Univ)*; Park, Kwang S. *(Seoul National University)*; Kim, Sungwan* *(Seoul National University)*

**16:24-16:26**                                                   FrDT1-02.8
**Multimodal Hand Stereotypies Detection in Rett Syndrome
Treatment using Deep Belief Neural Networks**
O'Leary, Heather* *(Boston Children's Hospital)*; Mayor Torres, Juan Manuel *(Boston Children's Hospital)*; D'Gama, Alissa *(Harvard Medical School)*; Kaufmann, Walter *(Greenwood Genetic Center)*; Sahin, Mustafa *(Boston Children's Hospital)*

**16:26-16:28**                                                   FrDT1-02.9
**Vest Type Multiplexed Wearable Device for
Cardiac Arrest Detection**
Ahn, Hyun Jun *(Hanyang University)*; Lee, Hyojin *(Biomedical Engineering Dept., University of Hanyang)*; Lee, Junchang *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

**16:28-16:30**                                                   FrDT1-02.10
**ECG Classification using Deep Learning**
Huang, Shu-yi *(Chung Yuan Christian Univ.)*; Chao, Yi-Ping *(Chang Gung Univ.)*; Shyu, L.-Y.* *(Chung Yuan Christian Univ.)*

**16:30-16:32**                                                   FrDT1-02.11
**Motion Artifact Detection using Cross-Correlation Pattern
Analysis of HbO and HbR in fNIRS Signal**
Lee, Gihyoun *(Daegu Gyeongbuk Institute of Science and Tech.)*; Jin, SangHyeon *(DGIST)*; Lee, Seung Hyun *(DGIST)*; Jinung, An* *(Daegu Gyeongbuk Institute of Science & Tech.)*

**16:32-16:34**                                                   FrDT1-02.12
**3-D Signature Recognition Method by
Orientation Correction of Inertial Sensor**
Kang, Shinil *(Hanyang University)*; You, Sungmin *(Hanyang University)*; Lee, Jong-Shill *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

**16:34-16:36**                                                   FrDT1-02.13
**Gait Authentication using 3-Axis Accelerometer: Regardless
of the Direction of Gait and Position of the Sensor**
Lee, SeungJae *(Hanyang University)*; Kang, Shinil *(Hanyang University)*; Lee, Jong-Shill *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

**16:36-16:38**                                                   FrDT1-02.14
**3D Space Signature Recognition with EMG Signals**
Joo, Seongsoo *(Hanyang University)*; Dohyun, Kim *(Hanyang University)*; Lee, Jong-Shill *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

**16:38-16:40**                                                   FrDT1-02.15
**A Method for Signal Leakage Correction of Minimum
Variance Beamformer using a Padé Approximation**
Lim, Sanghyun *(Korea Research Institute of Standards and Science (KRISS) and Un)*; Kim, Kiwoong* *(Korea Research Institute of Standards and Science)*

**16:40-16:42**                                                   FrDT1-02.16
**Heart Rate Estimation from PPG using Dictionary Learning**
Lee, Kwang Jin *(Gwangju Institute of Science and Tech. (GIST))*; Park, Chanki *(Gwangju Institute of Science and Tech.)*; Lee, Boreom* *(Gwangju Institute of Science and Tech. (GIST))*

**16:42-16:44**                                                   FrDT1-02.17
**Conversion of Lip Movements into Speech
using Gaussian Mixture Models**
Ra, Rina* *(Graduate School of System Informatics, Kobe University)*; Aihara, Ryo *(Graduate School of System Informatics, Kobe University)*; Takiguchi, Tetsuya *(Kobe University)*; Ariki, Yasuo *(Kobe University)*

**16:44-16:46**                                                   FrDT1-02.18
**Cardiac Risk Assessment based on T-Wave
Statistics from Holter ECG**
Shibui, Toyohito *(Hosei Univ. Graduate School)*; Aihara, Mitsuki *(Hosei Univ. Graduate School)*; Kinukawa, Yoshiki *(Hosei Univ. Graduate School)*; Yana, Kazuo* *(Hosei Univ.)*; Ichikawa, Tomohide *(Fujita Health Univ.)*; Watanabe, Eiichi *(Fujita Health Univ.)*; Yana, Kazuo *(Hosei Univ.)*

**16:46-16:48**                                                   FrDT1-02.19
**EEG based Emotional State Tracking during Watching
Movie Considering Self-Assessment Manikin**
Terasawa, Naoto* *(Nara Institute of Science and Technology)*; Tanaka, Hiroki *(Nara Institute of Science and Technology)*; Sakriani, Sakti *(Nara Institute of Science and Technology)*; Satoshi, Nakamura *(Nara Institute of Science and Technology)*

**16:48-16:50**                                                   FrDT1-02.20
**Improved Performance of Near-Infrared Spectroscopy
Brain-Computer Interface using Combinations of
Multi-Distance Source-Detector Separations**
Shin, Jaeyoung *(Hanyang University)*; Kwon, Jinuk *(Hanyang University)*; Im, Chang-Hwan* *(Hanyang University)*

**16:50-16:52**                                                   FrDT1-02.21
**Classifying Modulation Waveforms of Visual Stimuli via
Steady-State Visual Evoked Potentials**
Tanji, Yutaro *(Tokyo Univ. of Agriculture and Technology)*; Morikawa, Naoki *(Tokyo Univ. of Agriculture and Technology)*; Nakanishi, Masaki *(Univ. of California San Diego)*; Suefusa, Kaori *(Tokyo Univ. of Agriculture and Technology)*; Tanaka, Toshihisa* *(Tokyo Univ. of Agriculture and Technology)*

**16:52-16:54**                                                   FrDT1-02.22
**Prediction of Atrial Fibrillation based on
Random Forest Classifier**
Kim, Hyeonggon *(Yonsei)*; Kang, Chang Hoon *(Yonsei Univ.)*; Myoung, Hyoun Seok *(Yonsei Univ.)*; Lee, Seung Hwan *(Yonsei Univ,)*; Lee, Kyoung Joung* *(Yonsei Univ.)*

**16:54-16:56**                                                   FrDT1-02.23
**Cardiac Risk Assessment based on Multiple
Indices from Holter ECG Records**
Sato, Shunsuke *(Hosei Univ.)*; Murakami, Mami *(Hosei Univ. Graduate School)*; Nakamura, Saya *(Hosei Univ. Graduate School)*; Yana, Kazuo* *(Hosei Univ.)*; Ono, Takuya *(Nippon Medical School)*; Yana, Kazuo *(Hosei Univ.)*

**FrDT2-01: 16:10-17:10**                                    Cho Room
**Brain Image Analysis** (Poster Session)

**16:10-16:12**                                                   FrDT2-01.1
**Arterial Spin Labeling in ASPECTS-Guided Machine Learning
can Predict Clinical Outcome in Acute Ischemic Stroke Patients**
Ma, Samantha J.* *(University of Southern California)*; Yu, Songlin *(Beijing Tiantan Hospital, Capital Medical University)*; Liebeskind, David S. *(University of California, Los Angeles)*; Yan, Lirong *(University of Southern California)*; Scalzo, Fabien *(UCLA)*; Wang, Danny JJ *(University of Southern California)*

16:12-16:14                  FrDT2-01.2

**MR Volume Registration using Anatomical Reference Organ "Merkmal" for Analysis of the Brain Shift Transformation in the Closed Cranium**
Matsuda, Kento *(Kobe Univ.)*; Kumamoto, Etsuko\* *(Kobe Univ.)*; Hayashi, Shigeto *(Hyogo Emergency Medical Center, Kobe Red Cross Hospital)*; Nishino, Takashi *(Dept. of Chemical Science & Engineering Faculty of Eng)*; Nakai, Tomoaki *(Dept. of Neurosurgery, Kobe Univ. Graduate School)*; Kohmura, Eiji *(Dept. of Neurosurgery, Kobe Univ. Graduate School)*

16:14-16:16                  FrDT2-01.3

**Evaluating the Effect of Alzheimer's Disease Status on Co-Registration Accuracy of PET and MRI Brain Scans**
Veeramacheneni, Teja *(Brain Health Alliance)*; Taswell, S. Koby *(Brain Health Alliance)*; Taswell, Carl\* *(Brain Health Alliance)*

16:16-16:18                  FrDT2-01.4

**Expanding Nexus Diristries of Dementia Literature with the NPDS Concept-Validating Search Engine Agent**
Bae, Seung-Ho *(Brain Health Alliance)*; Craig, Adam *(Brain Health Alliance)*; Taswell, Carl\* *(Brain Health Alliance)*

16:18-16:20                  FrDT2-01.5

**Quantitative Evaluation of Magnetic Nanoparticle Distribution in Murine Brain using Magnetic Particle Imaging**
Inaoka, Yoshimi\* *(Graduate School of Medicine, Osaka University)*; Hosoi, Rie *(Osaka University)*; Murase, Kenya *(Osaka University)*; Kimura, Astuomi *(Osaka University)*

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**FrDT2-02: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – Contrast-Enhanced Dynamic MRI** (Poster Session)

16:10-16:12                  FrDT2-02.1

**DCE-MRI Data Analysis with Simultaneous B1/T1 Estimation**
Zhang, Jin *(NYU School of Medicine)*; Winters, Kerry *(NYU School of Medicine)*; Kim, Gene\* *(NYU School of Medicine)*

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**FrDT2-03: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – Diffusion Tensor and Diffusion Spectrum Imaging** (Poster Session)

16:10-16:12                  FrDT2-03.1

**Correlation Tensor using Resting State fMRI in Corpus Callosum**
Byeon, Kyoungseop *(Sungkyunkwan University)*; Lee, In Haeng *(Sungkyunkwan University)*; Lee, Dong Gyu *(Sungkyunkwan University)*; Kim, Jonghoon *(Sung Kyun Kwan University)*; Park, Bo-yong *(Sungkyunkwan University)*; Park, Hyunjin\* *(Sungkyunkwan University)*

16:12-16:14                  FrDT2-03.2

**The Effects of Template and Improved Registration on Tract based Spatial Statistics**
Choi, Yong-Ho *(Hanyang Univ.)*; Kwon, Hunki *(Dept. of Biomedical Engineering, Hanyang Univ.)*; Lee, Jong-Min\* *(Hanyang Univ.)*; Boahen, Collins Kwadwo *(Hanyang Univ.)*

16:14-16:16                  FrDT2-03.3

**Bias-Free Fractional Anisotropy in Diffusion Tensor Imaging of the Brain using a ROI Approach**
Seo, Youngseob\* *(Korea Research Institute of Standards & Science (KRISS))*

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**FrDT2-04: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – Image Reconstruction** (Poster Session)

16:10-16:12                  FrDT2-04.1

**Accelerating Multi-Contrast MR Imaging with Deep Learning Exploring their Intra-Correlations**
Wang, Shanshan *(Shenzhen Institutes of Advanced Tech.)*; Zhao, Tao *(Paul C. Lauterbur Research Center for Biomedical Imaging, SIAT,)*; Xiao, Taohui *(Paul C. Lauterbur Research Center for Biomedical Imaging, SIAT,)*; Tan, Sha *(Paul C. Lauterbur Research Center for Biomedical Imaging, SIAT,)*; Ying, Leslie *(State Univ. of New York at Buffalo)*; Gan, Yangzhou *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Liang, Dong\* *(Shenzhen Institutes of Advanced Tech.)*

16:12-16:14                  FrDT2-04.2

**Comparison of Tolerance to K-Space Mis-Centering: Filtered Back-Projection versus Fast Fourier Transform via Gridding**
Lee, JeongTaek\* *(Sungkyunkwan University)*; Park, Jinil *(Sungkyunkwan University)*; Lee, Seung-Kyun *(Sungkyunkwan University)*; Park, Jang-Yeon *(Sungkyunkwan University)*

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**FrDT2-06: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – MR Neuroimaging** (Poster Session)

16:10-16:12                  FrDT2-06.1

**MR-Based Electrical Conductivity Map of Brain Metabolites**
Katoch, Nitish *(Kyung Hee University)*; Choi, Bup Kyung *(Kyung Hee University)*; Sajib, Saurav Z K *(Kyung Hee University)*; Kim, Hyung Joong *(Kyung Hee University)*; Kwon, Ohin *(Konkuk University)*; Woo, Eung Je\* *(Kyung Hee University)*

16:12-16:14                  FrDT2-06.2

**Effect of Brain Extraction of Low Resolution Arterial Spin Labeling (ASL) fMRI Images on Realignment and Coregistration**
Liao, Justin *(Rochester Institute of Tech.)*; Petr, Jan *(Helmholtz-Zentrum Dresden-Rossendorf)*; Lazar, Roland M *(Columbia Univ. Medical Center)*; Marshall, Randolph S *(Columbia Univ. Medical Center)*; Asllani, Iris\* *(Rochester Institute of Tech.)*

16:14-16:16                  FrDT2-06.3

**Iterative Patch based Segmentation of MR Images via Dictionary Learning and Label Fusion Algorithm**
Hong, Jinwoo *(Hanyang University)*; Lee, Jong-Min\* *(Hanyang University)*; Yoon, Uicheul *(Catholic University of Daegu)*

16:16-16:18                  FrDT2-06.4

**Computer-Aided Diagnosis System for Brain Metastasis using Artificial Neural Network on 3D MRI**
Kim, Young Jae *(Gachon Univ.)*; Sunwoo, Leonard *(Seoul National Univ. Bundang Hospital)*; Choi, Seung Hong *(Seoul National Univ. College of Medicine)*; Lee, Seung Hyun *(Kwangwoon Univ.)*; Kim, Kwang Gi\* *(Gachon Univ.)*

16:18-16:20                  FrDT2-06.5

**The Evaluation of Cortical Thickness Extraction Algorithm Effects on Longitudinal Brain MRI Study**
Kim, Bo-Hyun *(Hanyang University)*; Lee, Jong-Min\* *(Hanyang University)*; Cho, Hyangryeong *(Hanyang University)*

16:20-16:22                  FrDT2-06.6

**Quantification of Spatial Variability for Severity of White Matter Hyperintensities**
Yang, Jin-Ju *(Hanyang Univ.)*; Kim, Hee Jin *(Sungkyunkwan Univ. School of Medicine)*; Seo, Sang Won *(Sungkyunkwan Univ. School of Medicine)*; Lee, Jong-Min\* *(Hanyang Univ.)*

16:22-16:24                  FrDT2-06.7

**Segmentation of Corpus Callosum in Midsagittal using Bayes Risk**
Park, Gilsoon *(Hanyang Univ.)*; Bang, SungKyu *(Hanyang Univ.)*; Lee, J.-M.\* *(Hanyang Univ.)*; Park, Y.-H. *(Hanyang Univ.)*

16:24-16:26                  FrDT2-06.8

**Geometric Convolutional Neural Network (gCNN) for Analyzing Surface-Based Neuroimaging Data**
Seong, Si-Baek *(Yonsei University College of Medicine)*; Park, Hae-Jeong\* *(Yonsei University)*

16:26-16:28                  FrDT2-06.9

**Accelerated MRI Susceptibility Mapping for Brain Iron Quantification**
Miao, Xin\* *(Univ. of Southern California)*; Guo, Yi *(Univ. of Southern California)*; Nayak, Krishna *(Univ. of Southern California)*; Wood, John *(Childrens Hospital Los Angeles)*

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**FrDT2-07: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – MR Spectroscopy** (Poster Session)

16:10-16:12                  FrDT2-07.1

**Analysis of the Feasibility in using the SPICE for Transient CSI Signal**
Song, Jae Eun *(Dept. of Electrical and Electronic Engineering, Yonsei Univ)*; Kim, Dong-Hyun\* *(Yonsei University)*

**16:12-16:14**          FrDT2-07.2

**Neurochemical Alterations in the Hippocampus of High-Fat Induced Preclinical Model: in Vivo MR Spectroscopy**
Lim, Song-I* *(The Catholic Univ. of Korea, College of Medicine)*

**16:14-16:16**          FrDT2-07.3

**Metabolic Alterations induced by Repeated Exposure to Dizocilpine on the Prefrontal Cortex of Schizophrenic Rat Model: in Vivo Proton Magnetic Resonance Spectroscopy Study**
Yoo, Chi-Hyeon* *(The Catholic University of Korea)*

**16:16-16:18**          FrDT2-07.4

**Quantification of Hepatic Acid Metabolism in a Lipogenic Methionine/Choline-Deficient Diet-Fed Animal Model with Spin-Spin Relaxation Time by using in Vivo Magnetic Resonance Spectroscopy**
Song, Kyu-Ho* *(The Catholic Univ. of Korea, College of Medicine)*

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**FrDT2-08: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – MRI RF Coil Technology** (Poster Session)
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**16:10-16:12**          FrDT2-08.1

**A 3D Printed Curve-Fitting Mechanism for Animal Array Coil**
Wu, Edzer L.* *(National Taiwan University)*; Cheng, Po-Wei *(Taiwan)*; Chen, Jyh-Horng *(National Taiwan University)*

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**FrDT2-09: 16:10-17:10**          Cho Room
**Magnetic Resonance Imaging – Pulse Sequence** (Poster Session)
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**16:10-16:12**          FrDT2-09.1

**Velocity Measurement with 4D Phase Contrast MRI According to Scan Parameter in the Vessel Model**
Park, Jieun *(Kyungpook National University)*; Kim, Junghun *(Kyungpook National University,)*; Park, YuJin *(Kyungpook National University)*; Hwang, Moon Jung *(GE Healthcare)*; Lee, Jongmin* *(Kyungpook National University)*

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**FrDT3-01: 16:10-17:10**          Park Room
**Deformable Image Registration** (Poster Session)
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**16:10-16:12**          FrDT3-01.1

**Following the Diabetic Feet Progress for the Prevention of Ulcers using Optical Image Registration Techniques**
Bosnjak, Antonio* *(Univ. de Carabobo.)*; Zequera Diaz, Martha Lucia *(Full Professor at Pontificia Univ. Javeriana - Electronics)*; Magjarevic, Ratko *(Univ. of Zagreb)*; Escalona, Omar Jacinto *(Univ. of Ulster)*; Seketa, Goran *(Faculty of electrical engineering and computing, Univ. of Z)*

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**FrDT3-02: 16:10-17:10**          Park Room
**Image Feature Extraction** (Poster Session)
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**16:10-16:12**          FrDT3-02.1

**Classification of Barrett's Esophagus Sub-Classes and Neoplasia using Texture Features of Endomicroscopy Imaging**
Park, Bo-yong *(Sungkyunkwan University)*; Won, Ji Hye *(Sungkyunkwan University)*; Lee, Seok Young *(Sungkyunkwan University)*; Kang, Deuk Cheol *(University)*; Kim, Ju Hyung *(Sungkyunkwan University)*; Bong, Jisoo *(Sungkyunkwan University, Information and Communication Engineeri)*; Park, Hyunjin* *(Sungkyunkwan University)*

**16:12-16:14**          FrDT3-02.2

**Deep Convolutional Neural Networks for Prostate Cancer Detection in Infrared Spectroscopic Imaging**
Kwak, Jin Tae* *(Sejong University)*; Hewitt, Stephen *(National Institutes of Health)*; Bhargava, Rohit *(University of Illinois at Urbana-Champaign)*

**16:14-16:16**          FrDT3-02.3

**Texture Analysis of Supraspinatus Ultrasound Image for Computer Aided Diagnostic System**
Bag, Byung Eun *(Yonsei Univ.,)*; Oh, Kyeong Taek *(Yonsei Univ.)*; Kwon, JunHwan *(Yonsei Univ.)*; Kim, Han Woong *(Yonsei Univ.)*; Jang, Wonseuk *(Yonsei Univ.)*; Yoo, Sun K.* *(Yonsei Univ. Health System)*; Oh, Seung Young *(Yonsei Univ.)*

**16:16-16:18**          FrDT3-02.4

**MR Image Analysis of Sagittal Tongue Shape in Patients with Obstructive Sleep Apnea Syndrome (OSAS)**
Mikami, Tsuyoshi* *(Tomakomai College of Tech.)*; Yonezawa, Kazuya *(National Hospital Organization Hakodate Hospital)*

**16:18-16:20**          FrDT3-02.5

**Automated Lung Cancer Detection on Computed Tomography Images**
Cho, Woo Sang *(Seoul National University)*; Lee, Kyoung Jin *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*

**16:20-16:22**          FrDT3-02.6

**Deep Learning based Surgical Tool Tracking in Robot-Assisted Endoscopic Video Images**
Lee, Dongheon *(Seoul National Univ.)*; Kong, Hyoun-Joong *(Chungnam National Univ. School of Medicine)*; Kwon, Hyungju *(Ewha Womans Univ. Medical Center)*; Yi, Jin Wook *(Seoul National Univ. Hospital)*; Yu, Hyeong Won *(Seoul National Univ. Bundang Hospital)*; Kim, Hyun Soo *(Seoul National Univ. Hospital)*; Lee, Kyu Eun *(Seoul National Univ. College of Medicine)*; Kim, Hee Chan* *(Seoul National Univ.)*

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**FrDT3-03: 16:10-17:10**          Park Room
**Image Reconstruction – Performance Evaluation** (Poster Session)
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**16:10-16:12**          FrDT3-03.1

**Investigation on Automated Strabismus Evaluation System**
Yoo, Sunyoung *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

**16:12-16:14**          FrDT3-03.2

**Integrated Real-Time Processing of Intravascular Ultrasound and Photoacoustic Imaging using Graphics Processing Unit**
Ahn, Joongho *(Pohang Univ. of Science and Technology)*; Cho, Seonghee *(Pohang Univ. Science and Technology)*; Kim, Kyungmin *(Postech)*; Managuli, Ravi *(Hitachi Aloka Medical America, Inc.)*; Kim, Yongmin *(Univ. of Washington)*; Kim, Chulhong* *(Pohang Univ. of Science and Technology)*

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**FrDT3-04: 16:10-17:10**          Park Room
**Image Reconstruction and Enhancement – Compressive Sensing/Sampling** (Poster Session)
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**16:10-16:12**          FrDT3-04.1

**Accelerated Multidimensional NMR Spectroscopy with Hankel Matrix Nuclear Norm Regularized Tensor Completion**
Ying, Jiaxi *(Dept. of Electronic Science, Xiamen University)*; Lu, Hengfa *(Xiamen University)*; Wei, Qingtao *(University of Science and Technology of China)*; Cai, Jian-Feng *(Dept. of Mathematics, Hong Kong University of Science and T)*; Guo, Di *(Xiamen University of Technology)*; Wu, Jihui *(University of Science and Technology of China)*; Chen, Zhong *(Xiamen University)*; Qu, Xiaobo* *(Xiamen University)*

**16:12-16:14**          FrDT3-04.2

**Projected Iterative Soft-Thresholding Algorithm for Tight Frames in Compressed Sensing Magnetic Resonance Imaging**
Liu, Yunsong *(Xiamen Univ.)*; Zhan, Zhifang *(Xiamen Univ.)*; Cai, Jian-Feng *(Dept. of Mathematics, Hong Kong Univ. of Science and T)*; Guo, Di *(Xiamen Univ. of Technology)*; Chen, Zhong *(Xiamen Univ.)*; Qu, Xiaobo* *(Xiamen Univ.)*

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**FrDT3-05: 16:10-17:10**          Park Room
**Image Reconstruction and Enhancement – Image Synthesis** (Poster Session)
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**16:10-16:12**          FrDT3-05.1

**Reconstruction of Projection Data in 3D Rotational X-Ray System using 3D Printing Phantom**
Joo, Huijin *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Kim, Yeji *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Sohn, Jeong-woo *(Daegu-Gyeongbuk Medical Innovation Foundation)*; Oh, Sung Suk* *(Daegu-Gyeongbuk Medical Innovation Foundation)*

**July 14 Friday**

**FrDT3-06:** 16:10-17:10      Park Room
**Image Reconstruction and Enhancement –
Tomographic Reconstruction** (Poster Session)

16:10-16:12      FrDT3-06.1
**Camera-Tracking vs. Image-Based Motion Compensation in a Tomographic Limb Ultrasound System**
Ranger, Bryan* *(Massachusetts Institute of Tech.)*; Feigin, Micha *(Massachusetts Institute of Tech.)*; Herr, Hugh *(MIT)*; Anthony, Brian W. *(Massachusetts Institute of Tech.)*

**FrDT3-07:** 16:10-17:10      Park Room
**Image Segmentation** (Poster Session)

16:10-16:12      FrDT3-07.1
**Deep Learning Application in Blood Vessel Segmentation of Retinal Fundus Images: A Spatial Boosting Model**
Ngo, Lua *(Korea University)*; Han, Jae-Ho* *(Korea University)*

16:12-16:14      FrDT3-07.2
**Automatic Shape-Constrained Mandible Segmentation and Refinement in Dental Cone-Beam CT Images**
Kim, Joojin *(Seoul Women's University)*; Lee, Minjin *(Seoul Women's University)*; Hong, Helen* *(Seoul Women's University)*

16:14-16:16      FrDT3-07.3
**Application of Deep Learning in Mammographic Breast Density**
Ahn, Chul Kyun *(Seoul Natl. Univ.)*; Lee, Jaewon *(Seoul Natl. Univ.)*; Park, Byungjun *(Seoul Natl. Univ.)*; Jeong, Gangwon *(Seoul Natl. Univ.)*; Kim, Jong Hyo* *(Seoul Natl. Univ.)*

16:16-16:18      FrDT3-07.4
**Automatic Detection of Cells in Phase Contrast Microscopy Images**
Kang, Un gyo *(Hanyang Univ.)*; Kim, Nayeong *(Hanyang Univ.)*; Nam, Hyeong Soo *(Hanyang Univ.)*; Shin, Yujin *(Hanyang Univ.)*; Gweon, B. *(Hanyang Univ.)*; Yoo, H.* *(Hanyang Univ.)*

16:18-16:20      FrDT3-07.5
**In-Vivo Estimation of Electrical Conductivity of a Rabbit Eye for Simulating Electric Field Distribution during Ocular Iontophoresis**
Lee, Sangjun *(Hanyang Univ.)*; Lee, Chany *(Hanyang Univ.)*; Kim, Euijin *(Hanyang Univ.)*; Ko, Song Ah *(Seoul National Univ.)*; Kim, Se Na *(Seoul National Univ.)*; Choy, Young Bin *(Seoul National Univ.)*; Im, Chang-Hwan* *(Hanyang Univ.)*

16:20-16:22      FrDT3-07.6
**Segmentation of the Spiculated Lesion and Decomposition of Its Complex Surrounding Structures for Invasive Pulmonary Adenocarcinomas in Thoracic Computed Tomography without Contrast**
Hsu, Fu-Sheng* *(Natl. Taiwan Univ.)*; Chen, Li Wei *(Natl. Taiwan Univ.)*; Wang, Hao-Jen *(Natl. Taiwan Univ.)*; Yang, Shun-Mao *(Natl. Taiwan Univ. Hospital & Natl. Taiwan Universi)*; Lin, Mong-Wei *(Natl. Taiwan Univ. Hospital & Natl. Taiwan Universi)*; Li, Chia-Chen *(Natl. Taiwan Univ.)*; Chen, Chung-Ming *(Natl. Taiwan Univ.)*

16:22-16:24      FrDT3-07.7
**Hierarchical Multi-Organ, Multi-Atlas Segmentation with Multi-Stage Registration and Label Fusion in Abdominal CT Images**
Kim, Hyeonjin *(Seoul Women's University)*; Hong, Helen* *(Seoul Women's University)*

16:24-16:26      FrDT3-07.8
**Detection of Significant Lung Mass in Thoracic PET/CT using Iterative Thresholding with PET-Driven Compensation**
Jang, Jinwook *(Korea Univ.)*; Kim, Kwangdon *(Korea Univ.)*; Jung, Young-Jun *(Korea Univ.)*; Lee, Hakjae *(Korea Univ.)*; Eo, Jae Seon *(Korea Univ. Guro Hospital)*; Lee, K.* *(Korea Univ.)*

16:26-16:28      FrDT3-07.9
**Texture based Segmentation of White Matter Hyper-Intensities in MRI**
Kadimesetty, Venkata Suryanarayana* *(Samsung R&D Institute India, Bangalore)*; Viswanathan, Srikrishnan *(Samsung R&D Institute India, Bangalore)*; Kwon, Oh-Hun *(Samsung Electronics)*

16:28-16:30      FrDT3-07.10
**Gradient Vector Flow Field and Fast Marching based Method for Centreline Extraction of Coronary Arteries in Human Patients**
Cui, Hengfei *(Nanyang Tech. Univ.)*; Wang, Desheng *(Inst. of space medico-engineering)*; Wan, Min *(Nanchang Univ.)*; Zhang, Jun-Mei *(Natl. Heart Center)*; Zhao, Xiaodan *(Natl. Heart Centre Singapore)*; Huang, Weimin *(Inst. for Infocomm Research, Agency for Science Tech.)*; Xiong, Wei *(Inst. for Infocomm Research, A-STAR)*; Zhou, Jiayin *(Inst. for Infocomm Research)*; Lim, Soo Teik *(Natl. Heart Centre Singapore)*; Tan, Ru San *(Natl. Heart Center)*; Tan, Swee Yaw *(Natl. Heart Center)*; Zhong, Liang* *(Natl. Heart Centre Singapore)*

**FrDT3-08:** 16:10-17:10      Park Room
**Regularized Image Reconstruction** (Poster Session)

16:10-16:12      FrDT3-08.1
**An L0 Norm based Non-Convex Sparse MRI Image Reconstruction with Classified Patch-Based Dictionary Training**
Zhan, Zhifang *(Xiamen Univ.)*; Liu, Yunsong *(Xiamen Univ.)*; Cai, Jian-Feng *(Dept. of Mathematics, Hong Kong Univ. of Science and T)*; Guo, Di *(Xiamen Univ. of Technology)*; Chen, Zhong *(Xiamen Univ.)*; Qu, Xiaobo* *(Xiamen Univ.)*

**FrDT3-09:** 16:10-17:10      Park Room
**Rigid-Body Image Registration** (Poster Session)

16:10-16:12      FrDT3-09.1
**An Extrinsic Calibration Method to Register Multiple Kinect Sensors for Human Body Scanning**
Cuellar Lopez, Juan Sebastian *(Universidad de los Andes)*; Herrera, Diana Sofia *(University of los Andes)*; Vargas, Paola Mariana *(University of los Andes)*; Sacristán, María Camila *(University of los Andes)*; Oh, Jieun *(National Cancer Center)*; Son, Jaebum* *(Universidad de los Andes)*

**FrDT4-01:** 16:10-17:10      Min Room
**Implantable Sensors** (Poster Session)

16:10-16:12      FrDT4-01.1
**Implantable Multi-Area Imaging Device with an Optical Data Transmitter for Brain Function Measurement**
Hayami, Hajime* *(NAra institute of science & tec)*; Haruta, Makito *(Nara Institute of Science & Tech.)*; Noda, Toshihiko *(Nara Institute of Science & Tech.)*; Sasagawa, Kiyotaka *(Nara Institute of Science & Tech.)*; Tokuda, Takashi *(Nara Institute of Science & Tech.)*; Ohta, Jun *(Nara Institute of Science & Tech.)*

16:12-16:14      FrDT4-01.2
**Wireless Power Transmission to Implantable Medical Devices for Gastroesophageal Reflux Disease: Measurement of Transmission Efficincy in a Conducting Liquid**
Katsuyama, Akiyoshi* *(Tokyo University of science)*; Kaga, Tadashi *(Tokyo University of Science)*; Shiba, Kenji *(Tokyo University of Science)*

16:14-16:16      FrDT4-01.3
**Design of Signal Processing Circuit for S-IMEHD with TCBT**
Kim, Jonghoon *(Kyungpook National Univ.)*; Kong, Hojun *(Kyungpook National Univ.)*; Kim, Myoungnam *(Kyungpook National Univ.)*; Cho, Jin-Ho* *(Kyungpook National Univ.)*

16:16-16:18      FrDT4-01.4
**Design of a Round Beam Plate of Hybrid Acoustic Sensor for use in Implantable Hearing Aids**
Mun, Hajun *(Kyungpook Natl. Univ.)*; Shin, Dongho *(Kyungpook Natl. Univ.)*; Park, Youngsik *(Kyungpook Natl. Univ.)*; Seong, Kiwoong *(Kyungpook Natl. Univ. Hospital)*; Song, Byung Seop *(Daegu Univ.)*; Cho, Jin-Ho* *(Kyungpook Natl. Univ.)*

**FrDT4-02:** 16:10-17:10      Min Room
**Implantable Sensors – Biocompatibility** (Poster Session)

16:10-16:12      FrDT4-02.1
**Highly Sensitive Implantable Transient Dopamine Sensor for Brain Disease**
Hwang, Suk-Won* *(Korea Univ.)*; Kim, Hyun-Seung *(Korea Univ.)*

**16:12-16:14** FrDT4-02.2

**Study on Micro Welding of Glass by Ultrafast Laser for Medical Device Packaging**
Kim, SungIl *(Hanbat Natl. Univ.)*; Choi, Jiyeon *(Korea Institute of Machinery and Materials (KIMM))*; Koo, Chiwan *(Hanbat Natl. Univ.)*; Kang, YoungHwan *(Hanbat Natl. Univ.)*; Kim, EungBo *(Hanbat Natl. Univ.)*; Cho, SungHwan *(Hanbat Natl. Univ.)*; Joung, YeunHo* *(Hanbat Natl. Univ.)*

**16:14-16:16** FrDT4-02.3

**Bio-Inspired Silicon Nanospikes Fabricated by Metal-Assisted Chemical Etching for Anti-Bacterial, Wearable Systems**
Siu, Vince* *(IBM T.J. Watson Research Center)*; Hu, Huan *(IBM T.J. Watson Research Center)*; Lu, Minhua *(IBM T.J. Watson Research Center)*; Gifford, Stacey *(IBM T.J. Watson Research Center)*; Meyer, Pablo *(IBM T.J. Watson Research Center)*; Kim, Sung-Cheol *(IBM T.J. Watson Research Center)*; Knickerbocker, John *(IBM T.J. Watson Research Center)*; Stolovitzky, Gustavo *(IBM T.J. Watson Research Center)*

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**FrDT4-03:** 16:10-17:10 Min Room
**Implantable Systems** (Poster Session)

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**16:10-16:12** FrDT4-03.1

**Design and Optimization of Resonant Coupling Wireless Power Transfer System for Small Power Implantable Medical Devices**
Ozawa, Yuta* *(Tokyo City University)*; Shimatani, Yuichi *(Tokyo City University)*; Kyoso, Masaki *(Tokyo City University)*; Kiryu, Shogo *(Tokyo City University)*

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**FrDT4-04:** 16:10-17:10 Min Room
**Integrated Sensor Systems** (Poster Session)

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**16:10-16:12** FrDT4-04.1

**A Multi-Modal Virtual Coach for Behavior Change**
Cruciani, Federico* *(Ulster University)*; Nugent, Chris *(University of Ulster)*; Cleland, Ian *(University of Ulster)*; McCullagh, Paul *(University of Ulster)*

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**FrDT4-05:** 16:10-17:10 Min Room
**Integrated Wearable and Portable Systems** (Poster Session)

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**16:10-16:12** FrDT4-05.1

**A Wearable Force Regulator for Reducing the Contact Force Effect on Photoplethysmographic Signals**
Sim, Jai Kyoung *(Korea Research Institute of Standards and Science (KRISS))*; Doh, Il* *(Korea Research Institute of Standards and Science (KRISS))*; Kim, Yong Tae *(Korea Research Institute of Standards and Science (KRISS))*

**16:12-16:14** FrDT4-05.2

**ECG Abnormality Detection within the Wearable Platform**
Song, Ju Hwan *(Samsung Electronics)*; Jeong, Jiseung *(Samsung Electronics)*; Bak, Changgyu *(Samsung Electronics)*; Vasyltsov, Ihor* *(Samsung Electronics)*

**16:14-16:16** FrDT4-05.3

**In-The-Ear EEG Device for an Effective and Comfortable SSVEP-Based BCI for Communication**
Sohn, Jangjay *(Seoul National Univ.)*; Ahn, Joong Woo *(Seoul National Univ.)*; Kim, Do Youn *(Interdisciplinary Program, Bioengineering, Graduate School, Seou)*; Kwon, Chiheon *(Seoul National Univ.)*; Kwon, Soon Bin *(Seoul National Univ.)*; Kim, Hee Chan* *(Seoul National Univ.)*

**16:16-16:18** FrDT4-05.4

**Portable Microbial Fuel Cell (MFC) System using Beverages as Energy Source for Supplying Mobile Healthcare Devices**
Yeo, Jeongjin *(Chonbuk National University)*; Jang, Suebin *(Chonbuk National University)*; Park, Mingun *(Chonbuk National University)*; Jeong, Seoi *(Chonbuk National University)*; Yang, Yoonseok* *(Chonbuk National University)*

**16:18-16:20** FrDT4-05.5

**Development of Mobile Body Composition Analyzer using the Single Impedance Measurement IC**
Kim, Tae San *(Kyung Hee University)*; Choi, Hyun Tae *(Kyung Hee University)*; Jang, Geuk Young *(Dept. of Biomedical Engineering, Graduate School, Kyung Hee)*; Oh, Tong In* *(Kyunghee University)*; Woo, Eung Je *(Kyung Hee University)*

**16:22-16:24** FrDT4-05.7

**The Optimal Sensor Position to Detect Various Poor Sitting Postures**
Nguyen, Manh Thang *(University of Ulsan)*; Dang, Quoc Khanh *(University of Ulsan)*; Chee, Youngjoon* *(University of Ulsan)*

**16:24-16:26** FrDT4-05.8

**Design of the Smartphone based Wearable Doppler Device for Continuous Blood Flow Monitoring and Prediction of Abnormalities of Vascular Function in the Carotid Artery**
Park, Junil *(Sogang University)*; Kang, Jinbum *(Sogang University)*; Song, Ilseob *(Sogang University)*; Yoo, Yangmo* *(Sogang University)*

**16:26-16:28** FrDT4-05.9

**Novel System Architecture for Online Gait Analysis**
Bentes, João *(School of Information Technology, Halmstad Univ.)*; Khandelwal, Siddhartha* *(Halmstad Univ.)*; Carlsson, Hampus *(School of Information Technology, Halmstad Univ.)*; Kärrman, Marcus *(Halmstad Högskola)*; Svensson, Tim *(Halmstad Univ.)*; Wickstrom, Nicholas *(Halmstad Univ.)*

**16:28-16:30** FrDT4-05.10

**Platform Prototype for Human Machine Interaction Applications**
Petrov, Vitaliy* *(Immanuel Kant Baltic Federal University)*; Botman, Stepan *(Immanuel Kant Baltic Federal University)*; Borchevkin, Danil *(Immanuel Kant Baltic Federal University)*

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**FrDT4-06:** 16:10-17:10 Min Room
**Mechanical Sensors and Systems** (Poster Session)

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**16:10-16:12** FrDT4-06.1

**Sensitivity of Inertial Sensors to Motor Compensation during a Goal Directed Reaching Task**
Miller, Aaron *(University of Tennessee)*; Wade, Eric* *(University of Tennessee)*

**16:12-16:14** FrDT4-06.2

**Development of a Tube Type Strain Sensor to Measure Grasping Power of Infants**
Choi, Ik-kyu* *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*; Chou, Namsun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*; Lee, Je sang *(Pusan National University Hospital)*; Shin, Yong Beom *(Pusan National University Hospital)*; Kim, Sohee *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

**16:14-16:16** FrDT4-06.3

**Personal Identification using Floor Vibration of Walking**
Nakajima, Kazuki* *(University of Toyama)*; Sugimoto, Ryosuke *(University of Toyama)*; Iikuni, Takahiro *(University of Toyama)*; Kim, Juhyon *(University of Toyama)*; Kanayama, Yoshio *(NEC Solution Innovators, Ltd.)*; Toda, Kazumasa *(NEC Solution Innovators, Ltd.)*; Kawabata, Minoru *(NEC Solution Innovators, Ltd.)*; Hagiwara, Mamoru *(Richell Corp.)*

**16:16-16:18** FrDT4-06.4

**Development of a Device for Customized Pleural Pressure Measurement**
Lim, Dongjun *(ASAN Medical Center)*; Joo, Segyeong* *(Asan Medical Center, University of Ulsan College of Medicine)*

**16:18-16:20** FrDT4-06.5

**Ultrasonic Tactile Sensor for Stiffness Measurement**
Qian, Yanjun* *(University of Waterloo)*; Han, Sang-wook *(ShINHAn University)*; Kwon, Hyock Ju *(University of Waterloo)*

**FrDT5-01:** 16:10-17:10      Lee Room
**New Sensing Techniques** (Poster Session)

16:10-16:12      FrDT5-01.1
**Development of a Solid State Sensor to Measure Volumetric Airflow**
Fourie, Christoffel Johannes Adriaan* *(Innovation4life)*; Steenkamp, Marco *(Stellenbosch Univ.)*; Perold, Wllem Johannes *(Stellenbosch Univ.)*; Fourie, Pieter Rousseau *(Stellenbosch Univ.)*

16:12-16:14      FrDT5-01.2
**Electrical Biosensing Platform by the Photoconductivity of Plasmonic Nanowire Structures**
Lee, Jihye *(Yonsei University)*; Kim, Jeong Hyeon *(Yonsei University)*; Yeo, Jong-Souk* *(Yonsei University)*

16:14-16:16      FrDT5-01.3
**Deep Health Eye: The Novel Non-Contact Heart Beat and Blood Pressure Imaging System**
Kim, Chan-Il *(Keimyung University)*; Kim, Yoon Nyun *(Keimyung University)*; Kim, Seon-Chil *(Keimyung University)*; Lee, Jong-Ha* *(Keimyung University, School of Medicine)*

16:16-16:18      FrDT5-01.4
**Study of a Coil Allocation Method using Magnetic Field Pattern in Transcranial Magnetic Stimulation**
Odagaki, Masato* *(Maebashi Institute of Techonlogy)*; Seko, Yuta *(Maebashi Institute of Tech.)*; Kikuchi, Yutaka *(Institute of Brain and Blood Vessels)*; Duan, Feng *(Nankai Univ.)*

16:18-16:20      FrDT5-01.5
**Pseudo Double-Gate MoS2 Field-Effect Transistor based Biosensor for Sensitive and Precise Diagnosis**
Park, Heekyeong *(ETRI)*; Jeong, Seok Hwan *(Sungkyunkwan Univ.)*; Liu, Na *(Sungkyunkwan Univ.)*; Yoo, G. *(Soongsil Univ.)*; Kim, Y.-J. *(ETRI)*; Kim, S.* *(Sungkyunkwan Univ.)*

**FrDT5-02:** 16:10-17:10      Lee Room
**Optical and Photonic Sensors and Systems** (Poster Session)

16:10-16:12      FrDT5-02.1
**Fundamental Optoelectronic Properties of Single Crystal Silicon Nanomembranes**
Shin, Jeong-Woong *(KU-KIST Graduate School of Converging Science and Technology, Ko)*; Lee, Joong Hoon *(Korea University)*; Hwang, Suk-Won* *(Korea University)*

16:12-16:14      FrDT5-02.2
**Combination of Periodic Gold Nanopillar Arrays and Aperiodic Gold Nanorods for Improvement of Surface-Enhanced Raman Spectroscopy**
Choi, Munsik *(Kyung Hee University)*; Byun, Kyung Min* *(Kyung Hee University)*

16:14-16:16      FrDT5-02.3
**Multi-Channel SPR Imaging System based on Digital Micro-Mirror Device and 3D Printing Technique**
Lee, Jaeyeon *(Kyung Hee University)*; Byun, Kyung Min* *(Kyung Hee University)*

16:16-16:18      FrDT5-02.4
**Proposal of a Method for Reducing Body Movement Artifacts from Photoplethysmographic Signals using Accelerometers**
Nishikawa, Shigeru* *(Meijo University)*; Mukai, Toshiharu *(Meijo University)*

16:18-16:20      FrDT5-02.5
**Noncontact Blood Distribution Measurement using Spatially-Resolved Spectroscopy**
Isse, Tatsuyoshi* *(Shizuoka University)*; Niwayama, Masatsugu *(Shizuoka University)*

16:20-16:22      FrDT5-02.6
**Improvement of Signal-to-Noise Ratio in Surface Enhanced Raman Spectroscopy using Spread-Spectrum Modulation**
Lee, Wonkyoung *(Electronics and Telecom. Research Institute)*; Park, Moonseong *(KAIST)*; Kim, Bong Kyu *(Electronics and Telecom. Research Institute)*; Jeong, Ki-Hun* *(KAIST)*

**FrDT5-03:** 16:10-17:10      Lee Room
**Physical Sensors and Sensor Systems – Acoustic Sensors and Systems** (Poster Session)

16:10-16:12      FrDT5-03.1
**FEA Simulation Study on Crosstalk in 1D Ultrasound Array Transducer with Inversion Layer Technique**
Sung, Jinho *(Dongguk University)*; Park, Chan Yuk *(Dongguk University)*; Kwon, Dasol *(Dongguk University)*; Jeong, Jong Seob* *(Dongguk University)*

16:12-16:14      FrDT5-03.2
**A Needle Hydrophone with a Cylindrical PVDF Sensing Element for Measuring a Cylindrically Focusing Acoustic Field**
Choi, Min Joo* *(Jeju National University)*; Kang, Gwansuk *(Jeju National University)*; Kwon, Ohbin *(Jeju National University)*; Ha, Kanglyeol *(Pukyong National University)*

**FrDT5-04:** 16:10-17:10      Lee Room
**Physical Sensors and Sensor Systems – Magnetic Sensors and Systems** (Poster Session)

16:10-16:12      FrDT5-04.1
**Magneto-Nanosensors for Monitoring Protein-Protein Interactions**
Lee, Jung-Rok* *(Stanford Univ.)*; Wang, Shan *(Stanford Univ.)*

16:12-16:14      FrDT5-04.2
**Evaluation of Material Characteristics of Textile Proximity Sensor for Medication Adherence Evaluation System**
Ho, Jong Gab *(SoonChunHyang Univ.)*; Wang, Changwon *(Soonchunhyang Univ.)*; Min, S.D.* *(SoonChunHyang Univ.)*

**FrDT5-05:** 16:10-17:10      Lee Room
**Physical Sensors and Sensor Systems – Mechanical Sensors and Systems** (Poster Session)

16:10-16:12      FrDT5-05.1
**Design and Implement of a Real-Time Monitoring Body Temperature and Pulse Measurement System**
Bang, Sangkwang *(Kyungpook National University)*; Wei, Qun *(Keimyung University)*; Park, Hee-Jun *(Keimyung University)*; Lee, Jyung Hyun* *(Kyungpook Naitonal University)*

16:12-16:14      FrDT5-05.2
**Development of Temperature-Compensated Pressure Sensor for RF Ablation Cancer Therapy**
Jeong, Yongrok *(KAIST)*; Park, Jaeho *(Korea Advanced Institute of Science and Technology (KAIST))*; Kim, Kyuyoung *(Korea Advanced Institute of Science and Technology)*; Gu, Jimin *(KAIST)*; Park, Inkyu* *(Korea Advanced Institute of Science and Technology (KAIST))*

16:14-16:16      FrDT5-05.3
**Detection of Dyskinetic Movements using Inertial Sensors for Patients with Parkinson's Disease**
Kim, Sang Kyong *(Seoul National University)*; Kim, Hanbyul *(Seoul National University)*; Jeon, Beom S. *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

16:16-16:18      FrDT5-05.4
**Sensitivity Enhancement of a Pressure Sensor using Porous Polyvinylidene Fluoride Structure**
Jung, Yungwoo *(Hanyang University)*; Choi, Eunsuk *(Hanyang University)*; Sul, Onejae *(Hanyang University)*; Lee, Seung-Beck* *(Hanyang University)*

**FrDT5-06:** 16:10-17:10      Lee Room
**Physical Sensors and Sensor Systems – New Sensing Techniques** (Poster Session)

16:10-16:12      FrDT5-06.1
**Construction of Sucking Ability Evaluation System for Infants**
Nishi, Eri* *(Setsunan University)*; Nagamatsu, Yuiko *(Osaka Koseinenkin Hospital)*; Niikawa, Takuya *(Osaka Electro-Communication University)*

**16:12-16:14**  FrDT5-06.2

**HDR Image Synthesis Technique for Active
Stereo 3D Endoscope System**
Furukawa, Ryo* *(Hiroshima City Univ.)*; Naito, Masahito
*(Hiroshima City Univ.)*; Miyazaki, Daisuke *(Hiroshima City
Univ.)*; Baba, Masashi *(Hiroshima City Univ.)*; Hiura, Shinsaku
*(Hiroshima City Univ.)*; Kawasaki, Hiroshi *(Kagoshima Univ.)*

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**FrDT5-07:**  16:10-17:10  Lee Room
**Physical Sensors and Sensor Systems – Optical and
Photonic Sensors and Systems** (Poster Session)

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**16:10-16:12**  FrDT5-07.1

**Label-Free Biochips for Accurate Detection of Prostate Cancer:
Combination of Biomarkers and Circulating Tumor Cells**
Yang, Hung-Wei* *(National Sun Yat-sen University)*

**16:12-16:14**  FrDT5-07.2

**Internet of Things (IoT) Functional Cardiac
Rehabilitation for Coronary Artery Disease**
Wang, Ching-Fu *(National Yang-Ming Univ.)*; Chou, Chin
*(National Yang-Ming Univ.)*; Chou, Yi-Ting *(National Yang-Ming
Univ.)*; Chen, Pochuan *(National Yang-Ming Univ.)*; Chen, Hsu-
Yan *(National Yang-Ming Univ.)*; Chuang, Hsuan-Ho *(NYMU)*;
Chen, You-Yin *(National Chiao-Tung Univ.)*; Huang, Hsin-Kai*
*(Tao-Yuan General Hospital)*

**16:14-16:16**  FrDT5-07.3

**A Time-Resolved NIRS Experiment using a CMOS Lock-In
Pixel Image Sensor with Highly Time-Resolving Capability**
Liu, Zhonghui* *(Shizuoka Univ.)*; Lioe, Dexing *(Shizuoka Univ.)*;
Seo, Min-Woong *(Shizuoka Univ.)*; Niwayama, Masatsugu
*(Shizuoka Univ.)*; Hakamata, Masashi *(Shizuoka Univ.)*;
Kagawa, Keiichiro *(Shizuoka Univ.)*; Yasutomi, Keita *(Shizuoka
Univ.)*; Fukushi, Yasuko *(Hamamatsu Univ. School of
Medicine)*; Yamamoto, Seiji *(Hamamatsu Univ. School of
Medicine)*; Kawahito, Shoji *(Shizuoka Univ.)*

**16:16-16:18**  FrDT5-07.4

**A Portable Shiga Toxins (Stx1 and Stx2) Sensing Device**
Kim, Jeongtae *(Hanbat National Univ.)*; Park, Jaewon
*(Southern Univ. of Science and Technology)*; Lee, Mooseung
*(Korea Research Institute of Bioscience & Biotechnology
(KRIBB))*; Koo, Chiwan* *(Hanbat National Univ.)*

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**FrDT5-08:**  16:10-17:10  Lee Room
**Physical Sensors and Sensor Systems – Thermal
Sensors and Systems** (Poster Session)

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**16:10-16:12**  FrDT5-08.1

**Evaluation of the Risk of Radiofrequency
Induced-Voltage in Rat Brain Tissue**
Wan, Sen* *(Tsinghua University)*; Jiang, Changqing *(Tsinghua
University)*; Li, Luming *(Tsinghua University)*

**16:12-16:14**  FrDT5-08.2

**Cryoprobe System with Built-In Thermocouple for Cryosurgery**
Tokiwa, Tatsuji* *(Hiroshima City University)*; Lev, Zimin
*(Graduate School of Information, Production and Systems,
Waseda U)*; Ishiguro, Hiroshi *(Kyushu Institute of Technology)*;
Yamakawa, Takeshi *(Fuzzy Logic Systems Institute)*

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**FrDT6-01:**  16:10-17:10  Zworykin Room
**BioMEMS/NEMS – Tissue Engineering
and Biomaterials** (Poster Session)

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**16:10-16:12**  FrDT6-01.1

**Establishment of the Brain Cell Culture Platform to Assess
the Safety of the Electrical Stimulation in BMI**
Park, Eun Young *(Korea Advanced Institute of Science and
Technology)*; Eunmin Ko, Eunmin *(KAIST)*; Shin, Jennifer
Hyunjong* *(KAIST)*

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**FrDT6-02:**  16:10-17:10  Zworykin Room
**Cellular Force Transduction – Cell Mechanics** (Poster Session)

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**16:10-16:12**  FrDT6-02.1

**Development of Cardiac Muscle Differentiation
Evaluation Platform**
Jin Hwa Lee, Jin Hwa *(KAIST)*; Ung Hyun Ko, Ung Hyun
*(KAIST)*; Eunmin Ko, Eunmin *(KAIST)*; Cho, Youngbin *(KAIST)*;
Shin, Jennifer Hyunjong* *(KAIST)*

**16:12-16:14**  FrDT6-02.2

**Alteration of Migration Polarity in Vascular Endothelial Cell
Depending on the Substrate Stiffness**
Shin, Yujin *(Hanyang University)*; Kim, Jin Won *(Korea
University Guro Hospital)*; Yoo, Hongki *(Hanyang University)*;
Gweon, Bomi* *(Hanyang University)*

**16:14-16:16**  FrDT6-02.3

**Dcef Induced Alteration of the Physical Forces
within the Cell Monolayer**
Cho, Youngbin *(KAIST)*; Minjeong Son, Minjeong *(KAIST)*;
Jeong, Hyuntae *(Korea Advanced Institute of Science and
Technology)*; Park, Eun Young *(Korea Advanced Institute of
Science and Technology)*; Ung Hyun Ko, Ung Hyun *(KAIST)*;
Shin, Jennifer Hyunjong* *(KAIST)*

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**FrDT6-03:**  16:10-17:10  Zworykin Room
**Cellular Force Transduction – Cell Motility** (Poster Session)

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**16:10-16:12**  FrDT6-03.1

**Unbalanced Distribution of Cellular Force in the MDCK Cell
Monolayer Expanding under HGF Gradient**
Jang, Hwanseok *(Korea Univ.)*; Park, Chan Young *(Harvard T.H.
Chan School of Public Health)*; Park, Yongdoo* *(Korea Univ.)*

**16:12-16:14**  FrDT6-03.2

**Reduced Impact of Substrate Stiffness by Switching
from 2D to 3D Extracellular**
Li, Zeyuan *(Hanyang University)*; Yoo, Hongki *(Hanyang
University)*; Gweon, Bomi* *(Hanyang University)*

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**FrDT6-04:**  16:10-17:10  Zworykin Room
**Cellular Force Transduction – Cell Spreading
and Adhesion** (Poster Session)

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**16:10-16:12**  FrDT6-04.1

**Biocompatibility of a Multifunctional Neural Probe Material**
Tyson, Joel *(UMBC)*; Slaughter, Gymama *(University of
Maryland Baltimore County)*

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**FrDT6-05:**  16:10-17:10  Zworykin Room
**Electric Fields – Tissue Regeneration** (Poster Session)

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**16:10-16:12**  FrDT6-05.1

**Detection of Adipocyte Differentiation under Three-
Dimensional Culture Condition using Electrical
Impedance Measurement**
Zemmyo, Daiki* *(Keio Univ.)*; Miyata, Shogo *(KEIO Univ.)*

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**FrDT6-06:**  16:10-17:10  Zworykin Room
**Electromagnetic Field Effects and Cell Membrane** (Poster Session)

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**16:10-16:12**  FrDT6-06.1

**Response of Synchronized Activity in Cultured
Neuronal Network after High-Intensity Power
Frequency Magnetic Field Exposure**
Saito, Atsushi* *(Central Research Institute of Electric Power
Industry)*; Takahashi, Masayuki *(CRIEPI)*; Nakasono, Satoshi
*(Central Research Institute of Electric Power Industry)*;
Jimbo, Yasuhiko *(Univ. of Tokyo)*

**16:12-16:14**  FrDT6-06.2

**Changes in Mechanical Properties of Cells by
Electrical Fields Treatment**
Han, Se Jik *(Kyung Hee University)*; Park, Moon Young *(Kyung
Hee University)*; Kim, Kyung Sook* *(Kyung Hee University)*;
Kwon, Sangwoo *(Dongguk University)*

**July 14 Friday**

**FrDT6-07:** 16:10-17:10      Zworykin Room
**Gene and Drug Delivery – Drug/Gene and Carrier Interactions** (Poster Session)

16:10-16:12      FrDT6-07.1
**Microfluidic High-Content Screening in a C. Elegans Model at Single Animal-Resolution**
Letizia, Maria Cristina* *(EPFL)*; Cornaglia, Matteo *(EPFL)*; Trouillon, Raphaël *(Ecole Polytechnique Fédérale de Lausanne)*; Gijs, Martin *(EPFL)*

**FrDT6-08:** 16:10-17:10      Zworykin Room
**Scaffolds in Tissue Engineering** (Poster Session)

16:10-16:12      FrDT6-08.1
**Tri Layered Composite Nanofibers Loaded Simvastatin for Bone Tissue Regeneration**
Awasthi, Ganesh Prasad *(Chonbuk Natl. Univ.)*; Rezk, Abdelrahman* *(Chonbuk Natl. Univ.)*; Rajan Unnithan, Afeesh *(Chonbuk Natl. Univ.)*; Kim, Ju Yeon *(Chonbuk Natl. Univ.)*; Hwang, Jae Hun *(Chonbuk Natl. Univ.)*; Park, Chan Hee *(Chonbuk Natl. Univ.)*; Kim, Cheol Sang *(Chonbuk Natl. Univ.)*

16:12-16:14      FrDT6-08.2
**Fabrication of Biodegradable, Biocompatible Scaffold using the Bombyx Mori Silk Fibroin for Bone Regeneration**
Lee, Ji Yeon* *(Chonbuk National Univ.)*; Ko, Sung Won *(Chonbuk National Univ.)*; Lee, Joshua *(Chonbuk National Univ.)*; Lee, Seoyeon *(Chonbuk National Univ.)*; Jang, Serim *(Chonbuk National Univ.)*; Park, Chan Hee *(Chonbuk National Univ.)*; Kim, Cheol Sang *(Chonbuk National Univ.)*

16:14-16:16      FrDT6-08.3
**Biphasic Biocompatible PU/PCL Scaffolds for Small-Diameter Vascular Tissue Engineering**
Oh, Gayeon *(Daelim University College)*; Noh, Jeong Won *(Daelim University College)*; Yun, Yonghyeon* *(Daelim University College)*; Lee, Deuk Yong *(Daelim University)*

16:16-16:18      FrDT6-08.4
**A Study on Developing Guideline of Performance Evaluation for an Absorbable Internal Hemostat**
Cho, Eunjeong *(Ministry of Food & Drug Safety)*; Park, Chang Won *(Natl. Institute of Food & Drug Safety Evaluation, Ministry)*; Yoo, Sihyung *(Ministry of Food & Drug Safety)*; Kim, Eunkyo *(Medical Devices Research Division)*; Lee, Jiwon *(Ministry of Food & Drug Safety)*; Na Young, Kwon *(Ministry of Food & Drug Safety)*; Kim, Mi Hye* *(Ministry of Food & Drug Safety)*

16:18-16:20      FrDT6-08.5
**PU/PEG Blend Scaffolds Prepared by Electrospinning for Small-Diameter Vascular Tissue Engineering**
Seol, Bokyung *(Daelim Univ.)*; Shin, Ji-Yean *(Daelim Univ.)*; Yun, Yonghyeon* *(Daelim Univ.)*; Lee, Deuk Yong *(Daelim Univ.)*; Kim, Bae-Yeon *(Univ. of Incheon)*

**FrDT6-09:** 16:10-17:10      Zworykin Room
**Scaffolds in Tissue Engineering – Biofabrication** (Poster Session)

16:10-16:12      FrDT6-09.1
**Biodegradation and Biocompatibility of Poly L-Lactic Acid Implantable Mesh in Rats**
Yoon, Sang-Don *(Sungkyunkwan Univ.)*; Park, Duk-In *(Korea Conformity Lab)*; Song, Moon-Yong *(Korea Conformity Lab)*; Hur, Su-Gil *(Korea Conformity Lab)*; Kwon, Young-Sam* *(Kyungpook National Univ.)*

16:12-16:14      FrDT6-09.2
**In-Vitro Nasal Mucous Membrane Gland-Like Structure Formation on a Microfluidic Chip**
Na, Kyuhwan* *(Korea University)*; Kim, Hyunho *(Korea University)*; Jun, Yesl *(Korea University)*; Cho, Youngkyu *(Korea University)*; Chung, Seok *(Korea University)*

16:14-16:16      FrDT6-09.3
**A Multi-Nozzle Bioprinting System with Single Rotating Stage for Fabrication of Tubular Construct**
Choi, Jaesoon* *(Asan Institute for Life Sciences, Asan Medical Center)*; Park, Sanghoon *(Asan Medical Center)*

**FrDT6-10:** 16:10-17:10      Zworykin Room
**Scaffolds in Tissue Engineering – Carbon-Nanotube** (Poster Session)

16:10-16:12      FrDT6-10.1
**A Simple and Rapid Fabrication Technique for Complex 3D Microelectrodes for Cell Recording**
Cools, Jordi* *(imec)*; Copic, Davor *(University of Cambridge)*; Callewaert, Geert *(KU Leuven Campus Kortrijk)*; Braeken, Dries *(IMEC)*; De Volder, Michael *(Catholic University of Leuven)*

**FrDT6-11:** 16:10-17:10      Zworykin Room
**Scaffolds in Tissue Engineering – Patterned 3D** (Poster Session)

16:10-16:12      FrDT6-11.1
**A Study of the 3D Printed Functional Artificial Blood Vessels**
Ahn, Chi Bum* *(Gachon University)*; Kim, Seung won *(Daegun High School)*; Hong, Do young *(Daegun High School)*; Son, Kuk Hui *(Gachon University)*; Lee, Jin woo *(Gachon University)*

**FrDT6-13:** 16:10-17:10      Zworykin Room
**Stem Cells – Tissue Morphogenesis** (Poster Session)

16:10-16:12      FrDT6-13.1
**Differentiation Characteristics of Xiphisternum-Derived Cells**
Park, Jae Seong *(Kyung Hee Univ.)*; Han, Jeong Eun *(Kyung Hee Univ.)*; Lee, EunAh* *(Kyung Hee Univ.)*; Oh, Tong In *(Kyunghee Univ.)*; Woo, Eung Je *(Kyung Hee Univ.)*

16:12-16:14      FrDT6-13.2
**Effect of FGF2-Driven Preconditioning on Differentiation Potentials of Adipose-Derived Stem Cells**
Lee, EunAh* *(Kyung Hee Univ.)*; Lee, Ji Soo *(Kyung Hee Univ.)*; Kim, Dae-Kwan *(Kyung Hee Univ.)*; Oh, Tong In *(Kyunghee Univ.)*; Woo, Eung Je *(Kyung Hee Univ.)*

**FrDT7-01:** 16:10-17:10      Herrick Room
**Motor Neuroprostheses – Robotics** (Poster Session)

16:10-16:12      FrDT7-01.1
**A Robotic Tool to Mimic the Human Lumbar Flexion and Evaluate the Efficacy of CFRP-Based Orthoses to Prevent Backbone Aches**
Kato, Yoshitaka* *(Kyushu Institute of Tech.)*; Matsuda, Akira *(Kyushu Institute of Tech.)*; Yoshida, Yuki *(Kyushu Institute of Tech.)*; Wagatsuma, Hiroaki *(Kyushu Institute of Tech.)*

**FrDT7-02:** 16:10-17:10      Herrick Room
**Neural Interfaces – Bioelectric Sensors** (Poster Session)

16:10-16:12      FrDT7-02.1
**Dopamine Sensor with Gold Nanowires for In-Vitro Study of Dopaminergic Neurons**
Han, Seonhye *(Norfolk State Univ.)*; Kim, Min Hyuck *(Norfolk State Univ.)*; Freeman, Montrey *(Norfolk State Univ.)*; Koech, Obadiah *(Norfolk State Univ.)*; Jackson, Guy *(Norfolk State Univ.)*; Yoon, Hargsoon* *(Norfolk State Univ.)*

**FrDT7-03:** 16:10-17:10      Herrick Room
**Neural Interfaces – Biomaterials** (Poster Session)

16:10-16:12      FrDT7-03.1
**A Feasibility Study for Carbon Nanotube Bundle as a Highly Thin and Flexible Cochlear Electrode Array**
Choi, Gwang Jin* *(Seoul Natl. Univ.)*; Lim, Yoonseob *(Korea Institute of Science & Tech.)*; Gwon, T.M. *(Seoul Natl. Univ.)*; Kim, S.M. *(Korea Institute of Science & Tech. Jeonbuk)*; Jun, S.B. *(Ewha Womans Univ.)*; Kim, S.J. *(Seoul Natl. Univ.)*

**FrDT7-04:** 16:10-17:10      Herrick Room
**Neural Interfaces – Body Interfaces** (Poster Session)

16:10-16:12      FrDT7-04.1
**Investigation of Frequency Bands Associated with Concentration**
Choi, Ga-Young *(Kumoh National Institute of Technology)*; Choi, Soo-In *(Kumoh National Institute of Technology)*; Hwang, Han-Jeong* *(Kumoh National Institute of Technology)*

16:12-16:14            FrDT7-04.2

**Surgical Evaluation of a Full-Body Prosthetic**
LaRocco, John* *(Univ. of Canterbury)*; Li, Pengwei *(Harbin Medical Univ.)*; Ren, Xiaoping *(Loyola Univ. in Chicago)*

16:14-16:16            FrDT7-04.3

**Towards a Cortico-Thalamic Responsive Deep Brain Stimulation for an Improved Treatment of Essential Tremor**
Opri, Enrico *(University of Florida)*; Molina, Rene *(University of Florida)*; Gunduz, Aysegul* *(University of Florida)*

16:10-16:12            FrDT7-05.1

**The Effect of Cell Culture Passage on the Viability and Differentiation Capacity of Human Stem Cells in Rat Sciatic Nerve Regeneration**
Du, Jian *(University of Maryland School of Medicine)*; Xu, Cynthia *(University of Maryland, School of Medicine)*; Zhang, Yifan *(Johns Hopkins University)*; Jia, Xiaofeng* *(University of Maryland School of Medicine, Johns Hopkins Univers)*

16:12-16:14            FrDT7-05.2

**Low-Level Light Therapy Promotes Trigeminal Ganglion Neuron Sprouting**
Seonho, Park *(Gwangju Institute of Science and Tech.)*; Chung, Euiheon* *(Gwangju Institute of Science and Tech.)*

16:10-16:12            FrDT7-06.1

**A Fabrication Method of an Interconnection Cable Integrated with Microfluidic Channels**
Kang, YooNa* *(DGIST (Daegu Gyeongbuk Institute of Science & Technology))*; Chou, Namsun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*; Kim, Sohee *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:12-16:14            FrDT7-06.2

**Polymer Packaging for Integrated Circuitry in Neural Interfaces**
Yoo, James* *(University of Southern California (USC))*; Scholten, Kee *(University of southern California)*; Meng, Ellis *(University of Southern California)*

16:14-16:16            FrDT7-06.3

**A Polymer-Based Inrtracochlear Electrode Array for Animal Study**
Min, Kyou Sik* *(Seoul National Univ.)*; Kim, Jinwon *(Seoul National Univ.)*; Kim, Doo Hee *(Yonsei Univ.)*; Gwon, Tae Mok *(Seoul National Univ.)*; Kim, Sung June *(Seoul National Univ.)*; Oh, Seung Ha *(Seoul National Univ. of Medicine)*

16:16-16:18            FrDT7-06.4

**An Implantable Neural Stimulation System using Wireless Power Transmission for Freely Moving Animals**
Kim, Tae-Woo* *(SAIHST, Sungkyunkwan Univ.)*; Park, Eun-Kyoung *(Hanyang Univ.)*; Heo, Man seung *(Samsung Medical Center)*; Cho, Baek Hwan *(Samsung Advanced Institute of Technology)*; Lee, Kyu-Sung *(Samsung Medical Center)*

16:18-16:20            FrDT7-06.5

**A Wireless Implantable Neural Interface System for Concurrent Peripheral Nerve Stimulation and Recording**
Shon, Ahnsei *(University of Colorado Boulder)*; Chu, Jun-Uk* *(Korea Institute of Machinery and Materials)*; Youn, Inchan *(Korea Institute of Science and Technology)*

16:10-16:12            FrDT7-07.1

**Characterization of Au Nanoparticles (AuNPs) and PEDOT Plated Tetrodes and Thalamic Neural Signal Detecting in Vivo**
Lee, Daae *(Chungbuk National Univ.)*; Tran, Bao Tram *(Chungbuk National Univ.)*; Moon, Hyeongcheol *(Chungbuk National Univ.)*; Park, Young Seok* *(Chungbuk National Univ.)*

16:12-16:14            FrDT7-07.2

**Microelectrode Modification with Macroporous PEDOT/PSS to Enhance Neuronal Recording and Stimulation**
Aqrawe, Zaid* *(University of Auckland)*; Patel, Nitish *(University of Auckland)*; Montgomery, Johanna *(The University of Auckland, Centre for Brain Research)*; Travas-Sejdic, Jadranka *(The University of Auckland)*; Svirskis, Darren *(The University of Auckland, School of Pharmacy)*

16:14-16:16            FrDT7-07.3

**Customized Multi-Well Microelectrode Array System for Massive Electrical Recordings from Neuronal Cultures**
Kim, Daejeong *(KAIST)*; Kang, Hongki *(KAIST)*; Nam, Yoonkey* *(Korea Advanced Inst. of Science and Technology)*

16:16-16:18            FrDT7-07.4

**MEMS Fabrication of Neural Electrode with Microchannel using Photosensitive Polyimide**
Jung, Woohyun *(Korea Institute of Science and Tech.)*; Park, HyungDal *(Korea Institute of ScienceandTech.)*; Choi, Wonsuk *(Korea Institute of Science and Tech.)*; Kim, Ockchul *(Univ. of Science and Tech.)*; Jung, Sunyoung *(Korea Institute of Science and Tech.)*; Chung, Seok *(Korea Univ.)*; Kim, Jinseok* *(Korea Institute of Science and Tech)*

16:18-16:20            FrDT7-07.5

**Drug Delivery to Localized Cell with Microbot Manipulated by Light and Magnetic Fields**
Jang, Minsu *(Korea Institute of Science and Technology)*; Kim, Hoyeon *(Southern Methodist University)*; Kim, Ockchul *(University of Science and Technology)*; Um, Soong Ho *(Sungkyunkwan University)*; Kim, MinJun *(Drexel University)*; Kim, Jinseok* *(Korea Institute of Science and Tech)*

16:20-16:22            FrDT7-07.6

**Neural Interface for Regeneration of Nerve and Recovery of Motor Function**
Choi, Wonsuk *(Korea Institute of Science and Tech.)*; Park, HyungDal *(Korea Institute of Science and Tech.)*; Jung, Sunyoung *(Korea Institute of Science and Tech.)*; Kim, Ockchul *(Univ. of Science and Tech.)*; Jung, Woohyun *(Korea Institute of Science and Tech.)*; Park, Jong Woong *(Korea Univ.)*; Kim, Jinseok* *(Korea Institute of Science and Tech)*

16:10-16:12            FrDT7-08.1

**Event-Based Closed-Loop Bidirectional Neuromorphic Neural Engineering Platform**
Park, Jongkil* *(ETRI)*; Kim, Yong Hee *(ETRI)*; Jung, Sang-Don *(ETRI)*

16:10-16:12            FrDT7-09.1

**Analysis of the Porous Stimulation Electrode Characteristic using Electrochemical Impedance Spectroscopy in Visual Prostheses**
Kuwabara, Mariko* *(Nara Institute of Science & Technology)*; Tashiro, Hiroyuki *(Kyushu University)*; Terasawa, Yasuo *(Nidek Co., Ltd.)*; Nakano, Yukari *(Nidek Co., Ltd.)*; Noda, Toshihiko *(Nara Institute of Science and Technology)*; Tokuda, Takashi *(Nara Institute of Science and Technology)*; Ohta, Jun *(Nara Institute of Science and Technology)*

16:10-16:12            FrDT8-01.1

**Effect of Viewing Medium on Arm Reaching in a 3D Virtual Environment**
Fan, Mengying *(Sun Yat-sen University)*; Luo, Jie* *(Sun Yat-sen University)*; Song, Rong *(Sun Yat-sen University)*; Li, Le *(The First Affiliated Hospital, Sun Yat-sen University)*

**July 14 Friday**

**16:12-16:14**    FrDT8-01.2

**A Study on Training Effect of Passive Isokinetic Ankle Movement for the Elderly with Hemiparesis using a Novel 3-D Ankle Movement Trainer**

Cho, Sangwoo *(Natl. Rehabilitation Center Research Institute)*; Cho, Ji-Eun *(Natl. Rehabilitation Center)*; Lee, Hwiyoung *(Natl. Rehabilitation Center)*; Koo, Dohoon *(Natl. Rehabilitation Center)*; Shin, Joon-Ho *(Natl. Rehabilitation Center)*; Kim, Hogene* *(Natl. Rehabilitation Center)*

**16:14-16:16**    FrDT8-01.3

**Simultaneous EEG Recording of Competitive-Type Consumer Game Players**

Yokota, Yusuke* *(National Institute of Information and Communications Technology)*; Naruse, Yasushi *(National Institute of Information and Communications Technology)*

FrDT8-02:  16:10-17:10    Schwan Room
**Human Performance – Activities of Daily Living** (Poster Session)

**16:10-16:12**    FrDT8-02.1

**Cognitive Haptic based Rehabilitation System for Patient-Centric Home Therapy**

Pareek, Shrey *(Univ. of Illinois at Urbana-Champaign)*; Chembrammel, Pramod *(Univ. of Illinois at Urbana-Champaign)*; Esfahani, Ehsan *(Univ. at Buffalo, SUNY)*; Kesavadas, T.* *(Univ. of Illinois at Urbana-Champaign)*

FrDT8-03:  16:10-17:10    Schwan Room
**Human Performance – Cognition** (Poster Session)

**16:10-16:12**    FrDT8-03.1

**Enhanced Intersubject Correlations of Spontaneous Eyeblinks during Watching Movie**

Shin, Young Seok *(Eulji Univ.)*; Kim, Woo Seop *(Eulji Univ.)*; Shin, I Su *(Eulji Univ.)*; Song, Jung Yong *(Eulji Univ.)*; Jung, Duk Young* *(Eulji Univ.)*; Dong Pyo, Jang *(Hanyang Univ.)*; Kim, In Young *(Hanyang Univ.)*; Kim, Ku Ho *(Eulji Univ.)*

**16:12-16:14**    FrDT8-03.2

**Neurofeedback Sessions Measurement based on the User's Peak Alpha Frequency**

Peralta-Malváez, Lizbeth* *(Univ. de las Américas Puebla)*; Etcheverry, Gibran *(Univ. de las Américas Puebla)*

FrDT8-04:  16:10-17:10    Schwan Room
**Human Performance – Engineering** (Poster Session)

**16:10-16:12**    FrDT8-04.1

**Balance Control at Standing and Half-Rising Postures using Visual Biofeedback and Weight Support System**

Shiraishi, Ryoichiro* *(Univ. of Tsukuba)*; Kawamoto, Hiroaki *(Univ. of Tsukuba)*; Sankai, Yoshiyuki *(Univ. of Tsukuba)*

FrDT8-06:  16:10-17:10    Schwan Room
**Human Performance – Gait** (Poster Session)

**16:10-16:12**    FrDT8-06.1

**Evaluation of the Connection of Walking Training Apparatus for Crutch-Walk Training**

Iioka, Toshimitu* *(Tokyo Denki Univ.)*; Inoue, Jun *(Tokyo Denki Univ.)*; Hanazaki, Izumi *(Tokyo Denki Univ.)*; Kawamura, Kazuya *(Chiba Univ.)*; Kijima, Yoshifumi *(Fujimoto Hayasuzu Hospital)*; Fujimoto, Toshiro *(Fujimoto Hayasuzu Hospital)*

**16:12-16:14**    FrDT8-06.2

**Validation of Gait Detection and Analysis**

Pham, H. Minh* *(Christian-Albrechts-University)*; Maetzler, Walter *(Kiel University)*; Elshehabi, Morad *(Dept. of Neurology, Christian-Albrecht-University, Kiel)*

**16:14-16:16**    FrDT8-06.3

**Verification of Lower Limb Muscle Force by Ankle-Foot Orthosis**

Yamamoto, Masataka* *(Hyogo Prefectural Awaji Medical Center)*; Shimatani, Koji *(Prefectural Univ. of Hiroshima)*; Hasegawa, Masaki *(Faculty of Health and Welfare, Prefectural Univ. of Hiroshi)*; Murata, Takuya *(Hiroshima Univ.)*; Kurita, Yuichi *(Hiroshima Univ.)*

**16:16-16:18**    FrDT8-06.4

**Changes of Support Moment of Elderly Gait by Achilles Tendon Vibration**

Kim, Dong-Wook *(Chonbuk National Univ.)*; Kwak, Kiyoung* *(Chonbuk National Univ.)*; Kim, Huigyun *(Chonbuk National Univ.)*; Ko, Seunghun *(Chonbuk National Univ.)*

**16:18-16:20**    FrDT8-06.5

**A Study on the Detection of the Ramp Angle during Locomotion Transition**

Jung, Jiuk* *(Korea Institute of Machinery and Materials)*

**16:20-16:22**    FrDT8-06.6

**A Gait Analysis System for Neurologic Diseases using Two Ankle-Worn Accelerometers**

Lee, Suhwan *(Soonchunhyang Univ)*; Park, Jihwan *(Soonchunhyang Univ.)*; Im, Soobin *(Soonchunhyang Univ Bucheon Hospital)*; Nam, Yunyoung* *(Soonchunhyang Univ.)*

FrDT8-07:  16:10-17:10    Schwan Room
**Human Performance – Modelling and Prediction** (Poster Session)

**16:10-16:12**    FrDT8-07.1

**Toward a Simple Estimation of Maximum Joint Moment during Sit to Stand**

Hwang, Seoyoon *(DGIST (Daegu Gyeongbuk Institute of Science and Technology))*; Lee, Yang Soo *(Kyungpook National University Hospital)*; Kim, Jonghyun* *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

**16:12-16:14**    FrDT8-07.2

**Simulation of the Effect of Decreased Multifidus Muscle Bulk on Lumbar Kinematics using Force-Dependent Kinematics Analysis**

Ogata, Yuta* *(Kurume University)*; Yamamoto, Naosuke *(Kurume University)*; Tagawa, Yoshihiko *(Kurume University)*; Shiba, Naoto *(Kurume University Hospital)*

FrDT8-09:  16:10-17:10    Schwan Room
**Motor Learning, Neural Control, and Neuromuscular Systems** (Poster Session)

**16:10-16:12**    FrDT8-09.1

**Variation of Intrinsic and Reflex Contributions to Ankle Stiffness during Time-Varying Contractions**

Golkar, Mahsa* *(McGill Univ)*; Sobhani Tehrani, Ehsan *(McGill University)*; Kearney, Robert Edward *(McGill University)*

**16:12-16:14**    FrDT8-09.2

**Neural Activity Evoked by Sinusoidal Electrical Stimulation in the Reward Neural Circuit of Freely Moving Rats**

Cho, Yoon Kyung *(Ehwa Univ.)*; Lee, Jee Won *(Ewha Womans Univ.)*; Lee, Youjin *(Ewha Womans Univ.)*; Kim, Soonyoung *(Ewha Womans Univ.)*; Jeong, Hee Soo *(Ewha Womans Univ.)*; Kong, Chanho *(Yonsei Univ.)*; Shin, Jaewoo *(Yonsei Univ.)*; Koh, Chin Su *(Yonsei Univ.)*; Jung, Hyun Ho *(Yonsei Univ.)*; Chang, Jin Woo *(Yonsei Univ.)*; Jun, Sang Beom* *(Ewha Womans Univ.)*

**16:14-16:16**    FrDT8-09.3

**Evoked Electromyogram during Eccentric Contraction**

Yamamoto, Naosuke* *(Kurume University)*; Tagawa, Yoshihiko *(Kurume University)*; Takano, Yoshio *(Teikyo University)*

**16:16-16:18**    FrDT8-09.4

**Analysis of Lower Limb Muscles during Obstacle Crossing using Fuzzy Approximate Entropy**

Ma, Chenming *(School of Engineering,Sun Yat-sen Univ.)*; Chen, Na *(Dept. of Rehab. Medicine, First Affiliated Hospital)*; Song, Rong *(Sun Yat-sen Univ.)*; Li, Le* *(The First Affiliated Hospital, Sun Yat-sen Univ.)*; Luo, Jie *(Sun Yat-sen Univ.)*

**FrDT8-11:** 16:10-17:10      Schwan Room
**Neurological Disorders – Diagnostic and Evaluation Techniques**
(Poster Session)

16:10-16:12      FrDT8-11.1
**Abnormal Physiological Network Characteristics in Patients with Idiopathic REM Sleep Behavior Disorder during REM Sleep**
Her, Seong Jin *(Yonsei University)*; Cha, Kwang Su *(Yonsei University)*; Choi, Jeong Woo *(Yonsei University)*; Jung, Ki-Young *(Seoul National University College of Medicine)*; Kim, Kyung Hwan* *(Yonsei University)*

**FrDT8-12:** 16:10-17:10      Schwan Room
**Neuromuscular Systems – EMG Processing and Applications** (Poster Session)

16:10-16:12      FrDT8-12.1
**Topology based Data Analysis Determines Subgroups of the Forearm EMG Signal Features**
Phinyomark, Angkoon* *(ISI Foundation)*; Patania, Alice *(ISI Foundation)*; Ibáñez-Marcelo, Esther *(ISI Foundation)*; Khushaba, Rami N. *(University of Technology, Sydney (UTS))*; Petri, Giovanni *(ISI Foundation)*

16:12-16:14      FrDT8-12.2
**Bilateral Symmetry of Upper Limb Muscle Synergies during Postural Tasks**
Zhang, Bin *(Shanghai Jiao Tong University)*; Zhang, Dingguo* *(Shanghai Jiao Tong University)*

16:14-16:16      FrDT8-12.3
**Development of Hands-Free Pointing Device using Facial Electromyogram**
Hori, Junichi* *(Niigata University)*

**FrDT8-13:** 16:10-17:10      Schwan Room
**Neuromuscular Systems – Postural and Balance** (Poster Session)

16:10-16:12      FrDT8-13.1
**On the Consistency of Postural Responses Influenced by Gaze Change and Auditory Stimulation**
Hata, K.* *(Kogakuin Univ.)*; Fukuoka, Y. *(Kogakuin Univ.)*

**FrDT9-01:** 16:10-17:10      Plonsey Room
**Motor Neuroprostheses – Neuromuscular Stimulation** (Poster Session)

16:10-16:12      FrDT9-01.1
**A Neural Network Algorithm for Detection of Heel Strike and Heel Off Events using Inertial Sensors to Trigger a Drop Foot Stimulator**
Aqueveque, Pablo* *(University of Concepcion)*; Gomez, Britam *(University of Concepcion)*; Saavedra, Francisco *(University of Concepcion)*; Germany, Enrique I. *(University of Concepcion)*

**FrDT9-02:** 16:10-17:10      Plonsey Room
**Motor Neuroprostheses – Prostheses** (Poster Session)

16:10-16:12      FrDT9-02.1
**Decoding of Peripheral Nerve Activity to Restore Motor Function in Patients with Upper Limb Amputation**
Chu, Jun-Uk* *(Korea Institute of Machinery and Materials)*

**FrDT9-03:** 16:10-17:10      Plonsey Room
**Neural Stimulation** (Poster Session)

16:10-16:12      FrDT9-03.1
**Effect of Skull and CSF Thicknesses in Multi-Array Tdcs**
Im, Cheolki *(Gwangju Institute of Science and Tech.)*; Seo, Hyeon *(Gwangju Institute of Science and Tech.)*; Jun, Sung Chan* *(Gwangju Institute of Science and Tech.)*

16:12-16:14      FrDT9-03.2
**Transcranial Direct Current Stimulation Regulates Saturated Long-Term Potentiation in Visual Cortex of Rats**
Koo, Ho *(Wonkwang Univ.)*; Kim, Min Sun* *(Wonkwang Univ.)*

16:14-16:16      FrDT9-03.3
**Reproduction of the Object Stroking Sense by the Electrical Stimulation**
Kitani, Yuki* *(Kindai Univ. Graduate School of Engineering, Mechanical Eng)*; Oyama, Nozomi *(Kindai Univ. Faculty of Science and Engineering)*; Nochino, Teruaki *(Osaka Univ.)*; Okada, Shima *(Faculty of Science and Engineering, Kinki Univ.)*; Kosaka, Manabu *(Kindai Univ.)*

16:16-16:18      FrDT9-03.4
**A Miniaturized, Implantable Motor Cortex Stimulator System for Neuropathic Pain Rat Model**
Ahn, Seung-Hee* *(Seoul National University)*; Yun, Seunghyeon *(Seoul National University)*; Park, Jeong Hoan *(Seoul National University)*; Gwon, Tae Mok *(Seoul National University)*; Kim, Chaebin *(Seoul National University)*; Shim, Shinyong *(Seoul National University)*; Koh, Chin Su *(Yonsei University)*; Yoon, Min-Sik *(Yonsei University)*; Kong, Chanho *(Yonsei University)*; Jung, Hyun Ho *(Yonsei University)*; Jun, Sang Beom *(Ewha Womans University)*; Chang, Jin Woo *(Yonsei University)*; Kim, Sung June *(Seoul National University)*

16:18-16:20      FrDT9-03.5
**Retina Stimulation with Low-Frequency Ultrasound in Vivo**
Qiuju, Jiang *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Zhao, Huixia *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*; Qiu, Weibao* *(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)*

16:20-16:22      FrDT9-03.6
**Neural Spike Trains in Response to Rate-Amplitude-Modulated Pulsatile Electric Stimuli in an Auditory Nerve Fiber Model**
Mino, Hiroyuki* *(Kanto Gakuin University)*

16:22-16:24      FrDT9-03.7
**Periodic Electric Stimuli Can Enhance the Detection of Subthreshold Signals in a Hippocampal CA1 Neuron Model**
Mori, Ryosuke *(Kanto Gakuin Univ.)*; Mino, Hiroyuki* *(Kanto Gakuin Univ.)*; Durand, D. *(Case Western Reserve Univ.)*

16:24-16:26      FrDT9-03.8
**Subject-Specific Numerical Simulation of Low Intensity Focused Ultrasound Fields in the Brain**
Pahk, Ki Joo* *(Center for Bionics, Biomedical Research Institute, Korea Institu)*; Park, Tae Young *(Sangji University)*; Kim, Hyungmin *(Korea Institute of Science and Technology)*

16:26-16:28      FrDT9-03.9
**A Multi-Channel Asynchronous Neurostimulator to Mimic Neural Code for Cognitive Prosthesis**
Elyahoodayan, Sahar* *(University of Southern California)*; Berger, Theodore *(University of Southern California)*; Song, Dong *(University of Southern California)*

16:28-16:30      FrDT9-03.10
**3D-Printed Low-Intensity Focused Ultrasound (LIFU) Guidance System: An Accuracy Assessment Study**
Joe, Haeyoung* *(Korea Institute of Science and Technology(KIST) and Korea Univer)*; Pahk, Ki Joo *(Center for Bionics, Biomedical Research Institute, Korea Institu)*; Kim, Hyungmin *(Korea Institute of Science and Technology)*

16:30-16:32      FrDT9-03.11
**Optical Monitoring Zinc Transmission Evoked by Electrical Stimulation in the Mouse Hippocampus**
Kim, Soonyoung *(Ewha Womans University)*; Cho, Yoon Kyung *(Ehwa University)*; Jeong, Hyesun *(Agency for Defense Development)*; Jun, Sang Beom* *(Ewha Womans University)*

16:32-16:34      FrDT9-03.12
**Setup for Experiments in Focused Pulsed Ultrasound in Translational Biomedicine**
Krizaj, Dejan* *(Univ. of Ljubljana, Faculty of Electrical Engineering)*; Gradišek, Miha *(Univ. of Ljubljana, Faculty of Electrical Engineering)*; Kolmanič, Kaja *(Univ. of Ljubljana, Faculty of Medicine)*; Planinc, Domen *(Univ. of Ljubljana, Faculty of Medicine)*; Živin, Marko *(Univ. of Ljubljana, Faculty of Medicine)*

**FrDT9-04: 16:10-17:10**      Plonsey Room
**Neurorehabilitation** (Poster Session)

16:10-16:12      FrDT9-04.1
**Perception Frequency and Intensity of the Electrically-Elicited Vibration**
Ma, Joohyeong *(Kyung Hee University)*; Khang, Gon\* *(Kyung Hee University)*; Song, Tongjin *(Jungwon University)*

16:12-16:14      FrDT9-04.2
**Multi Attitude and Heading Reference System-Based Knee Joint Angle Monitoring for Knee Injury Patients**
Hur, Sue Jeong *(Carnegie Mellon University)*; Song, Kang-Il\* *(Korea Institute of Science and Technology)*; Jeong, Gu An *(Korea Institute of Science and Technology)*; Youn, Inchan *(Korea Institute of Science and Technology)*

16:14-16:16      FrDT9-04.3
**A Development of Variable Capacitance Multi-Point Pressure Sensor for Sensing Grip Power Distribution of an Artificial Hand**
Tsueda, Junya\* *(Toaki Univ.)*; Magatani, Kazushige *(Tokai Univ.)*

16:16-16:18      FrDT9-04.4
**Electromyogram Analysis System for the Electric Prosthetic Forearm Control**
Ariga, Shoko\* *(Tokai Univ.)*; Magatani, Kazushige *(Tokai Univ.)*

16:18-16:20      FrDT9-04.5
**Muscle Afferent Activation in Response to Low-Intensity Pulsed Ultrasound Stimulation**
Han, Sungmin *(Korea Institute of Science and Technology)*; Oh, Sungjin *(Korea Institute of Science and Technology)*; Kim, DongHwee *(Korea Institute of Science and Technology)*; Youn, Inchan\* *(Korea Institute of Science and Technology)*

16:20-16:22      FrDT9-04.6
**Cortical Activation during Wearable Robot-Assisted Gait in Patients with Chronic Stroke**
Lee, Suhyun *(Samsung Medical Center)*; Lee, Hwang-Jae *(Samsung Medical Center)*; Kim, Dong-Seok *(Sungkyunkwan Univ.)*; Chang, W.H. *(Samsung Medical Center, Sungkyunkwan Univ. School of Medici)*; Choi, B.-O. *(Sungkyunkwan Univ. School of Medicine)*; Ryu, G.H. *(Samsung Medical Center)*; Kim, Y.-H.\* *(Samsung Medical Center)*

16:22-16:24      FrDT9-04.7
**EEG-Based Gait Intention Recognition of Subacute Stroke Patients using Convolutional Neural Network**
Moon, Jeong Wook *(Seoul National University)*; Choi, Junhyuk *(Korea Institute of Science and Tech.)*; Chong, Eunsuk *(Korea Institute of Science and Tech.)*; Kim, Seung-Jong *(Korea Institute of Science and Tech.)*; Lee, Jong Min *(Korea Institute of Science and Tech.)*; Kim, Hyungmin\* *(Korea Institute of Science and Tech.)*

16:24-16:26      FrDT9-04.8
**A Study on Improvement of Neurological Rehabilitation in the Chemotherapy Rat Model by using Scene Training**
Yu, Qianhengyuan *(Zunyi Medical University)*; Zhao, Lei *(Zunyi Medical University)*; Wang, Jun *(Zunyi Medical University)*; Wang, Azhen *(Zunyi Medical University)*; Qin, Ling *(Zunyi Medical University)*; Li, Jianping *(Zunyi Medical University)*; Yang, Lin\* *(Zhuhai Campus, Zunyi Medical University)*

16:26-16:28      FrDT9-04.9
**Functional Electrical Stimulation (FES) Combined with Game Suppresses Alpha Rhythm in EEG**
In, Young-Ryeol *(Keimyung University)*; Ku, Jeonghun\* *(Keimyung University)*

16:28-16:30      FrDT9-04.10
**Toward a Simple Reaching Movement Training System with Joint Position Estimation for Upper Limb Rehabilitation**
Hwang, Yeji\* *(DGIST)*; Kim, Jonghyun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:30-16:32      FrDT9-04.11
**Clonus Detection using Inertia Sensor for Ankle Joint in Children with Cerebral Palsy**
Choi, Seoyoung\* *(Daegu Gyeonbuk Institute of Science & Technology)*; Kim, Jonghyun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:32-16:34      FrDT9-04.12
**Symmetry Assistance Effect for Sit-to-Stand Movement with a Wearable Hip-Assist Robot in Stroke Patients**
Lee, Hwang-Jae *(Samsung Medical Center)*; Lee, Suhyun *(Samsung Medical Center)*; Kim, Dong-Seok *(Sungkyunkwan University)*; Chang, Won Hyuk *(Samsung Medical Center, Sungkyunkwan University School of Medici)*; Kim, Kyungrock *(samsung)*; Choi, Byung-Ok *(Sungkyunkwan University School of Medicine)*; Ryu, Gyu Ha *(Samsung Medical Center)*; Kim, Yun-Hee\* *(Samsung Medical Center)*

**FrDT10-01: 16:10-17:10**      Schmitt Room
**Bioinformatics – Bioinformatics for Health Monitoring** (Poster Session)

16:10-16:12      FrDT10-01.1
**Estimation Model for Cardiopulmonary Fitness with a Wearable Sensor in Daily Life**
Kwon, Soon Bin *(Seoul National University)*; Ahn, Joong Woo *(Seoul National University)*; Kim, Hee Chan\* *(Seoul National University)*; Yoon, Hyung-Jin *(Seoul National University)*

16:12-16:14      FrDT10-01.2
**Relation between Severity of Sleep Apnea Syndrome and Mental Healthiness Evaluated from Voice**
Nakamura, Mitsuteru\* *(The University of Tokyo)*; Shinohara, Shuji *(The University of Tokyo)*; Omiya, Yasuhiro *(PST Inc.)*; Hagiwara, Naoki *(PST Inc.)*; Higuchi, Masakazu *(The University of Tokyo)*; Mitsuyoshi, Shunji *(Dept. of Verbal Analysis of Pathophysiology Graduate School of M)*; Danno, Hirosuke *(Minatomirai Medical Clinic)*; Tanaka, Shun-ichi *(Minatomirai Medical Clinic)*; Tokuno, Shinichi *(The University of Tokyo)*

**FrDT10-03: 16:10-17:10**      Schmitt Room
**General and Theoretical Informatics – Algorithms** (Poster Session)

16:10-16:12      FrDT10-03.1
**An Analysis of Gait Imbalance with Walking-Induced Fatigue**
Cho, Woohyeong *(INHA University)*; Quan, Chenghao *(INHA University)*; Kim, Yeon-Wook *(INHA University)*; Kwon, Jang Woo *(INHA University)*; Lee, Sangmin\* *(INHA University)*

16:12-16:14      FrDT10-03.2
**A Novel Accelerometer-Based Method for Stride Length Estimation**
Boutaayamou, Mohamed\* *(University of Liege)*; Schwartz, Cédric *(University of Liège)*; Denoël, Vincent *(University of Liege)*; Croisier, Jean-Louis *(University of Liege)*; Verly, Jacques *(University of Liège)*; Garraux, Gaëtan *(University of Liège)*; Brüls, Olivier *(University of Liege)*

16:14-16:16      FrDT10-03.3
**Self-Adaptive Multi-Objective Evolutionary Algorithm for Molecular Design**
Kannas, Christos\* *(University of Cyprus)*; Pattichis, Constantinos *(University of Cyprus)*

**FrDT10-04: 16:10-17:10**      Schmitt Room
**General and Theoretical Informatics – Artificial Intelligence** (Poster Session)

16:10-16:12      FrDT10-04.1
**Machine Learning Algorithm to Classify Falls using Insole System**
Cates, Benjamin J. *(Sungkyunkwan University)*; Sim, Taeyong *(Sungkyunkwan University)*; Heo, Hyun Mu *(Sungkyunkwan University)*; Kim, Kisun *(Swingbank Co. Ltd.)*; Youn, Su Hyun *(Sungkyunkwan University)*; Choi, Ahnryul\* *(Catholic Kwandong University)*; Mun, Joung Hwan *(Sungkyunkwan University)*

**16:12-16:14**  **FrDT10-04.2**

**Development of the Health Management Platform using Physiological Signals of Musculoskeletal System based on Internet of Things**

Kim, Kyong *(Chunbuk Provincial Univ.)*; Kim, Seong-Hyun\* *(Chungbuk Provincial College)*; Seol, Jeonga *(Chunbuk Provincial Univ.)*; Cho, Ju Yeon *(Chunbuk Provincial Univ.)*; Kim, Du Beom *(Chunbuk Provincial Univ.)*; Kim, Tae Won *(Chunbuk Provincial Univ.)*; Kim, Jae Jun *(Chonbuk National Univ. Automobile-parts & Mold Technology I)*; Kim, Je-Nam *(CAMTIC Advanced Mechatronics Technology Institute for Commercial)*; Chong, Woo-Suk *(CAMTIC Advanced Mechatronics Technology Institute for Commercial)*

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**FrDT10-05:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Big Data Analytics** (Poster Session)

**16:10-16:12**  **FrDT10-05.1**

**Selecting Diagnostic Parameters based on Pattern Identification of Functional Dyspepsia: Step 1– Literature Review and Expert Consensus Process**

Kim, Keun Ho\* *(Korea Institute of Oriental Medicine)*; Park, Jeong Hwan *(Korea Institute od Oriental Medicine)*; Lee, Sanghun *(Korea Institute of Oriental Medicine)*; Kim, Jihye *(Korea Institute of Oriental Medicine)*

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**FrDT10-06:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Computational Genotyping** (Poster Session)

**16:10-16:12**  **FrDT10-06.1**

**Drug Resistance Classification for Mycobacterium Tuberculosis using Multi-Output Model with Stacked Auto-Encoders**

Yang, Yang\* *(Univ. of Oxford)*; Clifton, David *(Univ. of Oxford)*

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**FrDT10-08:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Decision Support Systems** (Poster Session)

**16:10-16:12**  **FrDT10-08.1**

**Definition of a Decision Support System to Support Research on Head and Neck Cancer**

Lopez-Perez, Laura *(Universidad Politécnica de Madrid)*; Hernandez, Liss *(Universidad Politécnica de Madrid)*; Fico, Giuseppe\* *(Technical University of Madrid)*; Arredondo, María Teresa *(Technical University of Madrid)*

**16:12-16:14**  **FrDT10-08.2**

**Sleep Apnea Syndrome Screening Algorithm using Support Vector Machine from Heart Rate Variability**

Nakayama, Chikao\* *(Kyoto University)*; Fujiwara, Koichi *(Kyoto University)*; Matsuo, Masahiro *(Shiga University of Medical Science)*; Kano, Manabu *(Kyoto University)*; Kadotani, Hiroshi *(Shiga University of Medical Science)*

**16:14-16:16**  **FrDT10-08.3**

**Seven Year Follow-Up of Electrode Impedance in Human Basal Ganglia**

Eisinger, Robert *(University of Florida)*; Gunduz, Aysegul\* *(University of Florida)*

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**FrDT10-09:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Machine Learning** (Poster Session)

**16:10-16:12**  **FrDT10-09.1**

**A Study on Automatic OWAS Classification of the Working Postures of a Caregiver**

Omure, Yu\* *(Kyushu Institute of Technology)*; Izumi, Hiroyuki *(University of Occupational and Environmental Health, Japan)*; Shibata, Tomohiro *(Kyushu Institute of Technology)*

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**FrDT10-10:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Natural Language Processing** (Poster Session)

**16:10-16:12**  **FrDT10-10.1**

**Medical Question Answering Framework to Query Statistical Data**

Akhtar, Usman\* *(Kyung Hee University)*; Lee, Sungyoung *(Kyung Hee University)*

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**FrDT10-11:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Ontology** (Poster Session)

**16:10-16:12**  **FrDT10-11.1**

**Study on the Requirements for Designing Elderly-Friendly Health Management System based on Ontology**

Cho, Soo Jin *(Yonsei Univ. Health System)*; Park, Hea Jeong *(Yonsei Univ. Health System)*; Cho, Song Lee *(Yonsei Univ. Health System)*; Lee, Sun-Jae *(Severance Hospital Yonsei Univ.)*; Jang, HyeJung *(Yonsei Univ. Health System)*; Lee, Sang Eun *(Yonsei Univ. Health System)*; Chang, Hyuk-Jae *(Dept. of Internal Medicine, Severance Cardiovascular Hospit)*; Han, Taehwa\* *(Yonsei Univ. Health System)*

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**FrDT10-12:**  16:10-17:10  Schmitt Room

**General and Theoretical Informatics – Predictive Analytics** (Poster Session)

**16:10-16:12**  **FrDT10-12.1**

**Prediction of Glucose Level based on Time Series Analysis for Both Type1 and Type2 Diabetes**

Seo, Won Ju *(Pohang Univ. of Science and Technology)*; Lee, Seung-Hyun *(POSTECH)*; Kang, Wonok *(Pohang Univ. of Science and Technology (POSTECH))*; Park, Sooyoung *(Dept. of Statistics, Ewha Womans Univ., Seoul, South K)*; Jin, Sang-Man *(Samsung Medical Center)*; Park, Sung-Min\* *(POSTECH)*

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**FrDT10-13:**  16:10-17:10  Schmitt Room

**Imaging Informatics – Augmented Reality** (Poster Session)

**16:10-16:12**  **FrDT10-13.1**

**A Framework for Deformation Estimation of Elastic Bodies from Monocular Images**

Nakao, Megumi\* *(Kyoto Univ.)*; Saito, Akira *(Graduate School of Informatics, Kyoto Univ.)*; Matsuda, Tetsuya *(Kyoto Univ.)*

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**FrDT10-14:**  16:10-17:10  Schmitt Room

**Imaging Informatics – Image Analysis, Processing and Classification** (Poster Session)

**16:10-16:12**  **FrDT10-14.1**

**A Multimodal Smartphone-Based Skin-Care System for Cosmetic Application: Skin Tone and Skin Hydration Analysis**

Hwang, Minjoo\* *(Daegu Gyeongbuk Institute of Science &Technology)*; Kim, Sewoong *(Daegu Gyeongbuk Institute of Science & Technology)*; Hwang, Jae Youn *(Daegu Gyeongbuk Institute of Science and Technology)*

**16:12-16:14**  **FrDT10-14.2**

**Regional Detection of Hemorrhagic Transformation using Kernel Spectral Regression and Neural Networks on Multi-Modal MRI for Acute Ischemic Stroke**

Ma, Samantha J.\* *(University of Southern California)*; Yu, Songlin *(Beijing Tiantan Hospital, Capital Medical University)*; Liebeskind, David S. *(University of California, Los Angeles)*; Yan, Lirong *(University of Southern California)*; Wang, Danny JJ *(University of Southern California)*; Scalzo, Fabien *(UCLA)*

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**FrDT10-15:**  16:10-17:10  Schmitt Room

**Sensor Informatics – Behavioral Informatics** (Poster Session)

**16:10-16:12**  **FrDT10-15.1**

**A Study on Feature Analysis for Push and Stroke Manipulation of Elastic Objects**

Nakao, Megumi\* *(Kyoto Univ.)*; Matsuda, Tetsuya *(Kyoto Univ.)*

**FrDT10-16:** 16:10-17:10      Schmitt Room
**Sensor Informatics – Multi-Sensor Data Fusion** (Poster Session)

16:10-16:12      FrDT10-16.1
**Design of Rule-Based Binary Logic Algorithm for Automated Fugl-Meyer Assessment**
Lee, Seunghee* *(Daegu Gyeongbuk Institute of Science & Technology)*; Kim, Jonghyun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:12-16:14      FrDT10-16.2
**DEVOUR: Single Gesture Enable Armband based Diet Monitoring**
Lee, Junghyo* *(Arizona State Univ.)*; Paudyal, Prajwal *(Arizona State Univ.)*; Banerjee, Ayan *(Computer Science)*; Kim, Minho *(Arizona State Univ.)*; Sadeghi, Koosha *(Arizona State Univ.)*; Gupta, Sandeep K. S. *(Arizona State Univ.)*

**FrDT10-17:** 16:10-17:10      Schmitt Room
**Sensor Informatics – Physiological Monitoring** (Poster Session)

16:10-16:12      FrDT10-17.1
**Relationship between Arousal Responses and Differential Rate of Pulse Rate in Young Male Subjects**
Fujie, Tatsuro* *(Osaka Electro-Communication University)*; Tagawa, Munenori *(Osaka electro-communication University)*; Nakamura, Hideo *(Osaka Electro-Communication Univ)*

16:12-16:14      FrDT10-17.2
**Personalised Patient Monitoring in Haemodialysis using Hierarchical Gaussian Processes**
Zhu, Tingting *(University of Oxford)*; Colopy, Glen Wright *(University of Oxford)*; Pugh, Christopher *(University of Oxford)*; Clifton, David* *(University of Oxford)*

**FrDT10-18:** 16:10-17:10      Schmitt Room
**Sensor Informatics – Sensors and Sensor Systems** (Poster Session)

16:10-16:12      FrDT10-18.1
**Fatigue Estimation by Combination of the Facial Information and the Heart Rate Variability**
Kaeokwnoi, Akkarawat *(Hankyong National University)*; Kaewkannate, Kanitthika *(Hankyong National University)*; Kim, Soochan* *(Hankyong National University)*

16:12-16:14      FrDT10-18.2
**The Novel Wearable Heat and Cool Stamp Sensor for Automatic Body Temperature Regulation**
Heo, Dayoung *(Keimyung Univ.)*; Khayat, Karima *(Keimyung Univ.)*; Kim, Dongyun *(Keimyung Univ.)*; Kim, S.-C. *(Keimyung Univ.)*; Lee, J.H.* *(Keimyung Univ., School of Medicine)*

**FrDT10-19:** 16:10-17:10      Schmitt Room
**Sensor Informatics – Wearable Systems and Sensors** (Poster Session)

16:10-16:12      FrDT10-19.1
**Preliminary Study on Fall Type Identification using Waist-Attached IMU Signals**
Lee, Jung Keun* *(Hankyong National Univ.)*; Son, Jae Ik *(Hankyong National Univ.)*; Jeon, Tae Hyeong *(Hankyong National Univ.)*; Choi, Mi Jin *(Hankyong National Univ.)*

**FrDT11-01:** 16:10-17:10      Greatbatch Room
**High throughput Data – Sequencing Analysis** (Poster Session)

16:10-16:12      FrDT11-01.1
**A Method to Detect Small Inversion Candidates of Hemophilia a Patients using Pindel**
Nakanishi, Hiroki* *(Kogakuin University)*; Inaba, Hiroshi *(Tokyo Medical University)*; Fukutake, Katsuyuki *(Tokyo Medical University)*; Fukuoka, Yutaka *(Kogakuin University)*

**FrDT11-02:** 16:10-17:10      Greatbatch Room
**High throughput Data – Structured Data Visualization** (Poster Session)

16:10-16:12      FrDT11-02.1
**Development of Real Time Sign Language Interpretation System using Kinect V2**
Sanada, Makoto* *(Ritsumeikan University)*; Okada, Shima *(Faculty of Science and Engineering, Kinki University)*

**FrDT11-04:** 16:10-17:10      Greatbatch Room
**Systems Biology and Systems Medicine – Modeling of Biomolecular System Dynamics** (Poster Session)

16:10-16:12      FrDT11-04.1
**Accurate Flux Fields of Probability Mass in Stochastic Toggle Switch**
Terebus, Anna *(Univ. of Illinois at Chicago)*; Liu, Chun *(Penn State Univ.)*; Liang, Jie* *(Univ. of Illinois at Chicago)*

**FrDT11-05:** 16:10-17:10      Greatbatch Room
**Systems Modeling – Decision Making** (Poster Session)

16:10-16:12      FrDT11-05.1
**Computer Simulations of Steady Concentration Peritoneal Dialysis**
Lee, Kyoung Jin *(Seoul National University)*; Lee, Jung Chan* *(Seoul National University College of Medicine)*

**FrDT11-06:** 16:10-17:10      Greatbatch Room
**Translational Biomedical Informatics – Data Processing** (Poster Session)

16:10-16:12      FrDT11-06.1
**Biomedical Data Mining using Prostate Data in TCGA**
Kim, Kyung Ah* *(Chungbuk National University)*; Shon, Ho Sun *(Chungbuk National University)*; Park, Jea Sung *(Chungbuk National University)*; Cha, Eun Jong *(Chungbuk National University)*; Kim, Kyoung Ok *(Woosong University)*

16:12-16:14      FrDT11-06.2
**A Statistical Integrative Analysis Method for Small Size Expression Data of Micrornas and Genes**
Ohki, Takuya *(Kogakuin University)*; Umezu, Tomohiro *(Tokyo Medical University)*; Ohyashiki, Junko H. *(Tokyo Medical University)*; Fukuoka, Yutaka* *(Kogakuin University)*

**FrDT11-07:** 16:10-17:10      Greatbatch Room
**Image Classification** (Poster Session)

16:10-16:12      FrDT11-07.1
**Automated Prostate Cancer Detection on Peripheral Zone based on Multi-Parametric Magnetic Resonance Texture Feature Classification**
Kim, YoungGi *(Seoul Women's University)*; Jung, Julip *(Seoul Women's University)*; Hong, Helen* *(Seoul Women's University)*; Hwang, Sung Il *(Seoul National University College of Medicine, Dept. of Radio)*; Lee, Hak Jong *(Seoul National University College of Medicine, Dept. of Radio)*

16:12-16:14      FrDT11-07.2
**Multi-Channel Deep Feature Classification of Angiomyolipoma without Visible Fat and Renal Cell Carcinoma in Abdominal CT Images with Texture Image Patches**
Lee, Han Sang *(KAIST)*; Hong, Helen* *(Seoul Women's Univ.)*; Kim, Junmo *(KAIST)*

16:14-16:16      FrDT11-07.3
**Transfer Learning with Deep Residual Networks for Prostate Cancer Detection in Multiparametric Magnetic Resonance Imaging**
To, Nguyen Nhat Minh *(Sejong University)*; Kim, Jeong Kon *(Asan Medical Center)*; Kwak, Jin Tae* *(Sejong University)*

**16:16-16:18**  FrDT11-07.4
**Detection of Masses in Mammography using Convolutional Neural Networks a Preliminary Assessment**
Shaharabany, Tal *(Holon Institute of Technology)*; Lederman, Dror* *(Holon Institute of Technology)*

**16:18-16:20**  FrDT11-07.5
**Determination of Direction from Colonoscopy Videos using the Horn and Schunck Algorithm and a Patterning Method**
Cho, Minwoo *(Interdisciplinary Program in Bioengineering, Graduate School, Se)*; Kong, Hyoun-Joong *(Chungnam National Univ. School of Medicine)*; Kim, Jee Hyun *(Dept. of Internal Medicine and Liver Research Institute, Se)*; Lee, Woo Hyung *(Dept. of Biomedical Engineering, Seoul National Univ.)*; Hong, Kyoung Sup *(Dept. of Internal Medicine and Liver Research Institute, Se)*; Kim, Sungwan* *(Seoul National Univ.)*

**16:20-16:22**  FrDT11-07.6
**Fine-Tuning Residual Networks for Classifying Prostate Tissue Components**
Vu, Quoc Dang *(Sejong University)*; Hewitt, Stephen *(National Institutes of Health)*; Kwak, Jin Tae* *(Sejong University)*

**16:22-16:24**  FrDT11-07.7
**Melanoma Progression Monitoring**
Dhinagar, Nikhil* *(Ohio Univ.)*; Celenk, Mehmet *(Ohio Univ.)*

**16:24-16:26**  FrDT11-07.8
**Automatic Detection of Small Bowel Ulcers in WCE using High Diversity Ensemble Learning Strategy**
Brandao Lima, Verissimo* *(Universidade do Minho)*; Vieira, Pedro Miguel *(Univ. of Minho)*; Freitas, Nuno Renato *(Univ. of Minho)*; Rolanda Gonçalves, Carla *(ICVS - Univ. of Minho)*; Lima, Carlos Manuel Gregorio Santos *(Univ. of Minho)*

**16:26-16:28**  FrDT11-07.9
**Differentiation of Part-Solid Ground-Glass Nodules with Small Solid Component from Pure Ground-Glass Nodules using Quantitative CT Texture Feature Classification**
Lee, Seon Young *(Seoul Women's Univ.)*; Jung, Julip *(Seoul Women's Univ.)*; Hong, Helen* *(Seoul Women's Univ.)*

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**FrDT12-01:** 16:10-17:10  Geddes Room
**Ablation** (Poster Session)

**16:10-16:12**  FrDT12-01.1
**Cauterization Device with Double-Layered Nozzle using Steam and Suction**
Yoshiki, Hitoshi* *(Tokyo Institute of Technology)*; Tadano, Kotaro *(Tokyo Institute of Technology)*; Kawashima, Kenji *(Tokyo Medical and Dental University)*

**16:12-16:14**  FrDT12-01.2
**Position Adjustment Method of Magnetic Field Supply and Detection Unit for Magnetic Hyperthermia using Ferromagnetic Implant**
Tonthat, Loi* *(Akita Univ.)*; Aki, Fumitaka *(Akita Univ.)*; Saito, Hajime *(AKITA Univ.)*; Mitobe, Kazutaka *(AKITA Univ.)*

**16:14-16:16**  FrDT12-01.3
**Soft Tissue Fragmentation by Laser-Generated Focused Ultrasound using a Low-f-Number CNT-PDMS Lens**
Heo, Jeongmin *(Sungkyunkwan University)*; Sang, Pilgyu *(Sungkyunkwan University)*; Joo, Mingyu *(Sungkyunkwan University)*; Baac, Hyoung Won* *(Sungkyunkwan University)*

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**FrDT12-02:** 16:10-17:10  Geddes Room
**Health Technology – Verification and Validation** (Poster Session)

**16:10-16:12**  FrDT12-02.1
**Laryngeal Prominence Movement Measurement with Depth Sensor for Evaluation of Swallowing Function**
Sugimoto, Chika* *(Yokohama National University)*; Masuyama, Yuto *(Yokohama National University)*

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**FrDT12-03:** 16:10-17:10  Geddes Room
**Health Technology Management and Assessment** (Poster Session)

**16:10-16:12**  FrDT12-03.1
**Evaluation of in Vitro and in Vivo Biocompatibility of Nitric Oxide Releasing Nanofiber for Continuous Glucose Monitoring Sensor**
Lee, Seo Kyung *(Kyung Hee University)*; Lee, Young Ju *(Kyung Hee University)*; Kim, Yeong-Rim *(Kwangwoon University)*; Heo, Min *(Kwangwoon University)*; Shin, Jae Ho *(Kwangwoon University)*; Lee, Gi-Ja* *(Kyung Hee University)*

**16:12-16:14**  FrDT12-03.2
**The Effect of Combination Treatment with Nitric Oxide and Hydrogen Sulfide on Hypoxia/reoxygenation-Induced Injury**
Lee, Young Ju *(Kyung Hee Univ.)*; Lee, Gi-Ja* *(Kyung Hee Univ.)*

**16:14-16:16**  FrDT12-03.3
**A Fully-Automated Pure Tone Audiometry System using EOG Induced by Spatially Rotating Sound Stimuli**
Kim, Do Yeon *(Hanyang Univ.)*; Kwon, Jinuk *(Hanyang Univ.)*; Kim, Joo-Young *(Hanyang Univ.)*; Kim, In-Young *(Hanyang Univ.)*; Im, Chang-Hwan* *(Hanyang Univ.)*

**16:16-16:18**  FrDT12-03.4
**Dosimetric Effect of Carbon Fiber Couch for FFF Beam of Elekta LINAC**
Song, William *(Saint Paul Preparatory School)*; Ahn, Sohyun* *(Yonsei University)*

**16:18-16:20**  FrDT12-03.5
**Development and Assessment of a Novel Ankle Rehabilitation System for Stroke Survivors**
Lee, Beom-Chan* *(University of Houston)*; Dae-Hee, Kim *(Korea Institute of Robot and Convergence)*; Son, Younsun *(University of Houston)*; Kap-Ho, Seo *(Korea Institute of Robot and Convergence)*; Sung Ho, Park *(Korea Institute of Robot and Convergence)*; Yoo, Dongyual *(University of Houston)*; Alberto, Fung *(University of Houston)*

**16:20-16:22**  FrDT12-03.6
**A New Fall-Inducing Technology Platform: Development and Assessment of a Programmable Split-Belt Treadmill**
Lee, Beom-Chan* *(University of Houston)*; Martin, Bernard *(University of Michigan)*; Thrasher, Timothy Adam *(University of Houston)*; Layne, Charles *(University of Houston)*

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**FrDT12-04:** 16:10-17:10  Geddes Room
**Plethysmography** (Poster Session)

**16:10-16:12**  FrDT12-04.1
**Investigation of Photoplethysmography AC Component Variation Before and After Surgery**
Seok, HyeonSeok *(Chonnam National University)*; Shin, Hangsik* *(Chonnam National University)*

**16:12-16:14**  FrDT12-04.2
**Computer-Aided Detection of Acromegaly using Three Dimensional Stereophotography**
Yu, Hsin-Ju* *(National Taiwan Univ.)*; Yang, Shih-Hung *(National Taiwan Univ. Hospital)*; Tseng, Han-Min *(National Taiwan Univ. Hospital)*; Chen, Chung-Ming *(National Taiwan Univ.)*; Shih, Shyang-Rong *(National Taiwan Univ.)*

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**FrDT12-05:** 16:10-17:10  Geddes Room
**Therapeutic Ultrasound** (Poster Session)

**16:10-16:12**  FrDT12-05.1
**Finite Element Method Simulation for Dual Concentric HIFU Transducer to Increase Lesion Size**
Kwon, Dasol *(Dongguk University)*; Jeong, Jong Seob* *(Dongguk University)*

**16:12-16:14**  FrDT12-05.2
**Fabrication of a Dual-Layer Focal Transducer for Simultaneous Generation of Optical and Piezoelectric Ultrasound**
Sang, Pilgyu *(Sungkyunkwan Univ.)*; Lee, SeungJin *(Sungkyunkwan Univ.)*; Baac, H.W.* *(Sungkyunkwan Univ.)*

**16:14-16:16**        FrDT12-05.3
**High-Amplitude Optoacoustic Transmitters Operated with Lower Than 1-MHz Frequency**
Joo, Mingyu *(Sungkyunkwan University)*; Sang, Pilgyu *(Sungkyunkwan University)*; Lee, SeungJin *(Sungkyunkwan University)*; Baac, Hyoung Won* *(Sungkyunkwan University)*

**16:16-16:18**        FrDT12-05.4
**Preliminary Study on Tissue Equivalent Superficial Varicose Vein Phantom for Ultrasonic Therapy**
Jeong, Yu Rang *(Inje Univ.)*; Kim, Ju Young *(Inje Univ.)*; Kim, Jin Woo *(inje Univ.)*; Kang, Ha Lim *(INJE Univ.)*; Noh, Si Cheol *(International Univ. of Korea)*; Choi, Heung Ho* *(Inje Univ.)*

**16:18-16:20**        FrDT12-05.5
**Basic Study for Quantitative Evaluation of Ultrasonic Varicose Veins Treatment using Ultrasonic Doppler Shift**
Jung, Tae Woong *(Inje University)*; Kim, Ju Young *(Inje University)*; Shin, Kyoungwon *(Inje University)*; Noh, Sumi *(Inje University)*; Noh, Si Cheol *(International University of Korea)*; Choi, Heung Ho* *(Inje University)*

**16:20-16:22**        FrDT12-05.6
**Inhibitory Effect by High-Frequency Ultrasound with Light Emitting Diode against HeLa Cell Proliferation**
Park, Kitae *(Kumoh National Institute of Tech.)*; Park, ChulWoo *(Kumoh National Institute of Tech.)*; Ryu, Jae Myung *(Kumoh National Institute of Tech., Dept. of Optical Enginee)*; Choi, Hojong *(Kumoh National Institute of Tech.)*; Choe, Se-woon* *(Kumoh National Institute of Tech.)*

**16:22-16:24**        FrDT12-05.7
**Focal Guidance and Amplitude Enhancement of Laser-Generated Focused Ultrasound by using 3-D Printed Micro-Guide Structures**
Lee, SeungJin *(Sungkyunkwan University)*; Baac, Hyoung Won* *(Sungkyunkwan University)*

**16:24-16:26**        FrDT12-05.8
**Gait Analysis in a Rat Crush Model with Focused Ultrasound Treatment**
Kim, DongHwee *(Korea Institute of Science and Tech.)*; Oh, Sungjin *(Korea Institute of Science and Tech.)*; Ha, Heeseung *(Korea Institute of Science and Tech.)*; Han, Sungmin *(Korea Institute of Science and Tech.)*; Kim, Hyungmin *(Korea Institute of Science and Tech.)*; Park, Jong Woong *(Korea University)*; Youn, Inchan* *(Korea Institute of Science and Tech.)*

**16:26-16:28**        FrDT12-05.9
**Parameters Influencing the Efficacy and Safety of Blood-Brain Barrier Modulation by Low-Intensity Focused Ultrasound**
Shin, Jaewoo* *(Yonsei Univ.)*; Kong, Chanho *(Yonsei Univ.)*; Lee, Jihyeon *(Yonsei Univ.)*; Koh, Chin Su *(Yonsei Univ.)*; Yoon, Min-Sik *(Yonsei Univ.)*; Na, YoungCheol *(Catholic Kwandong Univ. Internationa St Mary's Hospital)*; Chang, Jin Woo *(Yonsei Univ.)*; Chang, Won Seok *(Yonsei Univ.)*

**16:28-16:30**        FrDT12-05.10
**Cavitation Bubble Formation Reveals the Focal Geometry of Driving Focusing Shock Wave Field**
Kang, Gwansuk* *(Jeju National University)*; Huh, Jung Sik *(Jeju National University)*; Choi, Min Joo *(Jeju National University)*

**16:30-16:32**        FrDT12-05.11
**An Ultrasonic System with an Attachable Acoustic Lens for Investigation of Opening a Microfluidic Blood-Brain Barrier Model**
Oh, Min Tack *(Korea Institute of Science and Tech.)*; Kim, Hong Nam *(Korea Institute of Science and Tech.)*; Ko, Han Seok *(Korea Univ.)*; Lee, Seunghyun *(Seoul National Univ. Hospital)*; Kim, Jung Hoon *(Seoul National Univ. Hospital)*; Park, Kwan Kyu *(Hanyang Univ.)*; Lee, Byung Chul* *(Korea Institute of Science and Tech.)*

**16:32-16:34**        FrDT12-05.12
**Study on Developing Safety and Performance Evaluation Guideline for Extracorporeal Shockwave Lithotripsy System**
Lee, Chongju* *(Ministry of Food and Drug Safety)*; Koo, Yoonjeong *(Ministry of Food and Drug Safety)*; Kim, Jaeyoung *(Ministry of Food and Drug Safety)*; Choi, Sunghye *(Ministry of Food and Drug Safety)*; Park, Chang Won *(National Institute of Food and Drug Safety Evaluation, Ministry)*

**FrDT12-07: 16:10-17:10**        Geddes Room
**Ventilators** (Poster Session)

**16:10-16:12**        FrDT12-07.1
**Proposition of Nebulizer by using Venturi Effect**
Kim, Ji Sung *(Seoul National University)*; Seo, Jong Mo* *(Seoul National University, School of Engineering)*

**16:12-16:14**        FrDT12-07.2
**The Criteria and Methods of Essential Performance of the Medical Oxygen Concentrators According to the Latest International Standard**
An, Hyoujin* *(Korea Testing Certification)*; Seo, Han-Kyu *(Korea Testing Certification)*; Jeon, Sohye *(Korea Testing Certification)*; Park, Sukang *(Korea Testing Certification)*

**FrDT13-01: 16:10-17:10**        Dunn Room
**Health Informatics – Behavioral Health Informatics** (Poster Session)

**16:10-16:12**        FrDT13-01.1
**Types of Emotion and the Perception of Facial Disfigurement**
Engelmann, Jeffrey *(Univ. of Texas MD Anderson Cancer Center)*; Cho, Joowon* *(Univ. of Texas at Austin)*; Liu, Jun *(Univ. of Texas MD Anderson Cancer Center)*; Weston, June *(Univ. of Texas MD Anderson Cancer Center)*; Bordes, Mary *(Univ. of Texas MD Anderson Cancer Center)*; Vujanovic, Anka *(Univ. of Houston)*; Babcock, Julia *(Univ. of Houston)*; Fingeret, Michelle *(Univ. of Texas MD Anderson Cancer Center)*; Reece, Gregory *(Univ. of Texas MD Anderson Cancer Center)*; Hanson, Summer *(Univ. of Texas MD Anderson Cancer Center)*; Markey, Mia *(Univ. of Texas at Austin)*

**16:12-16:14**        FrDT13-01.2
**Effects of Breast Volume Change on Breast Cancer Patients' Satisfaction with Breast Reconstruction Outcomes**
Nicklaus, Krista *(The Univ. of Texas at Austin)*; Cho, Joowon* *(The Univ. of Texas at Austin)*; Cheong, Audrey *(The Univ. of Houston)*; Liu, Jun *(The Univ. of Texas MD Anderson Cancer Center)*; Merchant, Fatima *(Univ. of Houston)*; Fingeret, Michelle *(The Univ. of Texas MD Anderson Cancer Center)*; Reece, Gregory *(The Univ. of Texas MD Anderson Cancer Center)*; Markey, Mia *(The Univ. of Texas at Austin)*

**16:14-16:16**        FrDT13-01.3
**Healthy Lifestyle Induction using Fogg Behavior Model**
Bilal, Hafiz Syed Muhammad* *(Kyung Hee University)*; Lee, Sungyoung *(Kyung Hee University)*

**16:16-16:18**        FrDT13-01.4
**Variable State Kalman Filter for Ambulatory Estimation of Human Segment Orientation in Magnetically Disturbed Environments**
Choi, Mi Jin *(Hankyong National Univ.)*; Jeon, Tae Hyeong *(Hankyong National Univ.)*; Lee, Jung Keun* *(Hankyong National Univ.)*

**FrDT13-02: 16:10-17:10**        Dunn Room
**Health Informatics – Clinical Information Systems** (Poster Session)

**16:10-16:12**        FrDT13-02.1
**A Web-Based Activity and Care Support System to Integrate Multi-Sensor Data into Daily Clinical Practice**
Demko, Laszlo* *(Balgrist Univ. Hospital)*; Schneider, Sophie *(Univ. Hospital Balgrist)*; Gassert, Roger *(ETH Zurich)*; Curt, Armin *(Spinal Cord Injury Centre, Balgrist Univ. Hospital)*

**16:12-16:14**  FrDT13-02.2

**A Medical Image De-Identifier Bridging a Hospital Information System and Cloud Services**

Kuroda, Tomohiro* *(Kyoto University)*; Fujita, Kenichiro *(University of Hyogo)*; Yamamoto, Goshiro *(Kyoto University Hospital)*; Okamoto, Kazuya *(Kyoto University Hospital)*; Yakami, Masahiro *(Kyoto University)*; Nishio, Mizuho *(Kyoto University)*; Isoda, Hiroyoshi *(Kyoto University)*

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**FrDT13-03:**  16:10-17:10  Dunn Room

**Health Informatics – Cloud Computing for Healthcare** (Poster Session)

**16:10-16:12**  FrDT13-03.1

**Mining Minds: An Open Source Initiative towards Health and Wellness Platforms**

Amin, Muhammad Bilal* *(Kyung Hee Univ.)*; Khan, Wajahat Ali *(Kyung Hee Univ.)*; Khattak, Asad Masood *(Kyung Hee Univ.)*; Lee, Sungyoung *(Kyung Hee Univ.)*

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**FrDT13-04:**  16:10-17:10  Dunn Room

**Health Informatics – Computer-Aided Decision Making** (Poster Session)

**16:10-16:12**  FrDT13-04.1

**Development of Survivability Prediction Algorithm with National Trauma Data Bank (NTDB) for Remote Combat Casualty Care**

You, Sungmin *(Hanyang Univ.)*; Kim, Dohyun *(Hanyang Univ.)*; Lee, Jong-Shill *(Hanyang Univ.)*; Park, Hoon Ki *(Hanyang Univ. Hospital)*; Kim, In-Young* *(Hanyang Univ.)*

**16:12-16:14**  FrDT13-04.2

**Artificial Intelligence Accurately Detects Lung Diseases**

Topalovic, Marko* *(KU Leuven)*; Das, Nilakash *(KU Leuven)*; Aerts, Jean-Marie *(KU Leuven)*; Troosters, Thierry *(KU Leuven)*; Janssens, Wim *(UZ Leuven)*

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**FrDT13-05:**  16:10-17:10  Dunn Room

**Health Informatics – Decision Support Methods and Systems** (Poster Session)

**16:10-16:12**  FrDT13-05.1

**A Study on CDSS Modeling for Stress Screening using Case-Based Reasoning**

Park, Hea Jeong *(Yonsei Univ. Health System)*; Cho, Soo Jin *(Yonsei Univ. Health System)*; Cho, Song Lee *(Yonsei Univ. Health System)*; Lee, Sang Eun *(Yonsei Univ. Health System)*; Chang, Hyuk-Jae *(Dept. of Internal Medicine, Severance Cardiovascular Hospit)*; Song, Si Young *(Institute of Gastroenterology, Yonsei Univ. of College of M)*; Mun, Se Yeon *(Yonsei Univ. Health System)*; Yun, Young Mi *(Yonsei Univ. Health System)*; Han, Taehwa* *(Yonsei Univ. Health System)*

**16:14-16:16**  FrDT13-05.3

**Automatic Identification of Diabetes based on Vital Signs and Medical History in Post-Stroke Patients**

Vilic, Adnan* *(Technical University of Denmark)*; Sorensen, Helge B D *(Technical University of Denmark)*; Wienecke, Troels *(Zealand University Hospital, Roskilde)*; Kjaer, Troels W. *(Roskilde University Hospital)*

**16:16-16:18**  FrDT13-05.4

**Context-Aware Dialogue Management Framework for Healthcare**

Razzaq, Muhammad Asif* *(Kyung Hee University)*; Lee, Sungyoung *(Kyung Hee University)*

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**FrDT13-06:**  16:10-17:10  Dunn Room

**Health Informatics – eHealth** (Poster Session)

**16:10-16:12**  FrDT13-06.1

**Deployment of Generic Cross Border Ehealth Services in Cyprus**

Antoniou, Zinonas *(Univ. of Cyprus)*; Constantinou, Ioannis *(Univ. of Cyprus)*; Neofytou, Marios *(Univ. of Cyprus)*; Schiza, Eirini *(Univ. of Cyprus)*; Panayides, Andreas *(Univ. of Cyprus)*; Pattichis, Constantinos* *(Univ. of Cyprus)*; Schizas, Christos *(Univ. of Cyprus)*; Giorgitsi, Eleftheria *(DITS, Ministry of Health)*; Kalakouti-Kassapi, Monica *(DITS, Ministry of Health)*; Yiapatou, E. *(DITS, Ministry of Health)*; Kyriakides, M. *(Ministry of Health)*

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**FrDT13-07:**  16:10-17:10  Dunn Room

**Health Informatics – Emerging IT for Efficient/Low-Cost Healthcare Delivery** (Poster Session)

**16:10-16:12**  FrDT13-07.1

**A Study on Remote Management Process for Management of Automatic Cardioverter Defibrillator (AED)**

Jeon, Sohye* *(Korea Testing Certification)*; An, Hyoujin *(Korea Testing Certification)*; Nam, Seung Min *(LUCM CO.,Ltd)*; Park, Sukang *(Korea Testing Certification)*

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**FrDT13-08:**  16:10-17:10  Dunn Room

**Health Informatics – Health Information Systems** (Poster Session)

**16:10-16:12**  FrDT13-08.1

**Analysis Muscular Fatigue of Gluteus Maximus According to Maximum Pressure Change in Sitting Position**

Kim, Daechang* *(Dongguk University)*

**16:12-16:14**  FrDT13-08.2

**An ECG-HRV Data Format for Integrated Biosignal Big Data**

Hama, Kengo *(Hosei Univ.)*; Shibui, Toyohito *(Hosei Univ. Graduate School)*; Kaseda, Yuto *(Hosei Univ.)*; Endo, Yudai *(Hosei Univ.)*; Wakabayashi, Satoshi *(Hosei Univ.)*; Yana, Kazuo* *(Hosei Univ.)*; Yana, Kazuo *(Hosei Univ.)*

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**FrDT13-09:**  16:10-17:10  Dunn Room

**Health Informatics – Information Technologies for Healthcare Delivery and Management** (Poster Session)

**16:10-16:12**  FrDT13-09.1

**Nurse Call as a Sensor of Ward Status Reflecting Both Nurses' and Patients' Behavior**

Mori, Taketoshi* *(The University of Tokyo)*; Noguchi, Hiroshi *(The University of Tokyo)*; Miyahara, Maki *(The University of Tokyo)*; Araki, Daichi *(University of Tokyo)*; Kobayashi, K *(The University of Tokyo)*; Sanada, Hiromi *(The University of Tokyo)*; Murayama, Ryoko *(The University of Tokyo)*; Yoshida, Mikako *(The University of Tokyo)*; Yamamoto, Chiemi *(The University of Tokyo)*; Koyanagi, H *(The University of Tokyo)*; Ikegawa, Mitsuhiro *(HealthCare Relations Co., Ltd.)*

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**FrDT13-10:**  16:10-17:10  Dunn Room

**Health Informatics – Internet of Things** (Poster Session)

**16:10-16:12**  FrDT13-10.1

**Bedside Vital Data Terminal Reducing Nursing Tasks**

Kuroda, Tomohiro* *(Kyoto Univ.)*; Hikita, Tomoko *(Kyoto Univ. Hospital)*; Fujita, Kenichiro *(Univ. of Hyogo)*; Sugiyama, Osamu *(Kyoto Univ.)*; Okamoto, Kazuya *(Kyoto Univ. Hospital)*

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**FrDT13-11:**  16:10-17:10  Dunn Room

**Health Informatics – Mobile and Wearable Technologies for Elderly** (Poster Session)

**16:10-16:12**  FrDT13-11.1

**A Study on the Relationship between Body Fat Percentage and Cardiac Action Potential using Electric Field Analysis**

Onda, Hiroyuki* *(Kinki Univ.)*; Sugahara, Kengo *(Kinki Univ.)*; Okada, Shima *(Faculty of Science and Engineering, Kinki Univ.)*

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**FrDT13-12:**  16:10-17:10  Dunn Room

**Health Informatics – Mobile Health** (Poster Session)

**16:10-16:12**  FrDT13-12.1

**Adaptive Video Communications for Real-Time Mhealth Applications**

Antoniou, Zinonas *(University of Cyprus)*; Panayides, Andreas* *(University of Cyprus)*; Pantziaris, Marios *(The Cyprus Institute of Neurology and Genetics)*; Constantinides, Anthony G. *(Imperial College)*; Pattichis, Constantinos *(University of Cyprus)*; Pattichis, Marios *(University of New Mexico,)*

**16:12-16:14**  FrDT13-12.2

**Remote Diagnosis Leveraging the MPEG-DASH Standard**

Panayides, Andreas* *(University of Cyprus)*

**FrDT13-13:** 16:10-17:10        Dunn Room
**Health Informatics – Technology and Services for Home Care** (Poster Session)

16:10-16:12        FrDT13-13.1
**Change of Cognitive Abilities Depending on Color Light Stimulation**
Kim, Dong-Wook *(Chonbuk National University)*; Lee, Seonjin* *(Chonbuk National University)*

**FrDT13-14:** 16:10-17:10        Dunn Room
**Health Informatics – Telehealth** (Poster Session)

16:10-16:12        FrDT13-14.1
**Effects of WebRTC based Tele-Exercise on Fall-Related Risk Factors among the Elderly**
Kong, Hyoun-Joong *(Chungnam National University School of Medicine)*; Hong, Jeeyoung *(Seoul National University)*; Yoon, Hyung-Jin* *(Seoul National University)*

**FrDT14-01:** 16:10-17:10        Schaldach Room
**Physiological Monitoring – Instrumentation** (Poster Session)

16:10-16:12        FrDT14-01.1
**Measuring Deep Muscle Oxygenation using Near-Infrared Spectroscopy for Deformed Tissues by Pinching**
Matsuki, Yoshihiro* *(Shizuoka University)*; Niwayama, Masatsugu *(Shizuoka University)*

16:12-16:14        FrDT14-01.2
**Physiological Measurement in Virtual Reality Contents Watching; Photoplethysmograph Embedded in 3D VR Gaming Headset**
Otsuka, Seiya *(Teikyo University)*; Kurosaki, Kanami *(Teikyo University)*; Ogawa, Mitsuhiro* *(Teikyo University)*

16:14-16:16        FrDT14-01.3
**Properties of Back-Scattering Spectrum on in Vivo Measurement using NIRS via Interfering Medium**
Kawahara, Ryoma* *(Shizuoka University)*; Niwayama, Masatsugu *(Shizuoka University)*

16:16-16:18        FrDT14-01.4
**Detection of Micturition Desire with Monitoring Heart Rates in Elderly Women: Implication of Inactivity in Parasympathetic Nervous System**
Tomehata, Sumie* *(Kanto Gakuin University)*

16:18-16:20        FrDT14-01.5
**Non-Invasive Glucose Measurement using Different Optical Properties of Blood in Near Infrared Wavelengths**
Hasan, Mehedy *(Graduate Research Assistant, University of Utah)*; Kim, Hoon* *(University of Utah)*

16:20-16:22        FrDT14-01.6
**A Basic Study on Visibility Evaluation using N170**
Ishii, Takayuki* *(Tokyo City University)*; Matsumoto, Kana *(Tokyo City University)*; Hirakochi, Ren *(Tokyo City University)*; Kyoso, Masaki *(Tokyo City University)*

16:22-16:24        FrDT14-01.7
**Comparison of Electrode Technologies for Portable EEG Monitoring**
O'Sullivan, Mark* *(University College Cork)*; Poveda Pena, Jonatan *(Universitat Politècnica de Catalunya)*; O'Mahony, Conor *(Tyndall National Institute, University College Cork)*; Popovici, Emanuel *(University College Cork)*; Temko, Andriy *(University College Cork)*

16:24-16:26        FrDT14-01.8
**Development of Real-Time Pulse Measuring Device using Wireless Pressure Sensor**
Cho, SungHwan *(Hanbat National University)*; Choi, SangDong *(Hanbat National University)*; Cho, BeomKi *(Hanbat National University)*; Kim, SungIl *(Hanbat National University)*; Park, JaeSoon *(Hanbat National University)*; Kim, EungBo *(Hanbat National University)*; Kang, YoungHwan *(Hanbat National University)*; Joung, YeunHo* *(Hanbat National University)*

16:26-16:28        FrDT14-01.9
**Comparison of Movement Discrimination Method using Center-of-Gravity Variation Analysis on Bed by the Types of Mattress**
Araki, Daichi *(The University of Tokyo)*; Noguchi, Hiroshi *(The University of Tokyo)*; Mori, Taketoshi *(The University of Tokyo)*; Sanada, Hiromi *(The University of Tokyo)*; Kawaguchi, Takayasu* *(Tokyo University of Information Sciences)*

16:28-16:30        FrDT14-01.10
**A Wearable Device for Knee Joint Angle Measurement**
Kim, Je-Nam *(CAMTIC Advanced Mechatronics Tech. Institute for Commercial)*; Kim, Jae Jun *(Chonbuk National Univ. Automobile-parts & Mold Tech. I)*; Lee, Jung Ho *(CAMTIC Advanced Mechatronics Tech. Institute for Commercial)*; Jo, JongHyun *(CAMTIC)*; Kim, Kyung *(CAMTIC Advanced Mechatronics Tech. Institute for Commercial)*; Kim, Seong-Hyun *(Chungbuk Provincial College)*; Chong, Woo-Suk* *(CAMTIC Advanced Mechatronics Tech. Institute for Commercial)*

16:30-16:32        FrDT14-01.11
**Cardiopulmonary Coupling Analysis using Non-Contact Bio Signal Monitoring System**
Park, Jonguk *(Yonsei Univ.)*; Kang, KyuMin *(Yonsei Univ.)*; Urtnasan, Erdenebayar *(Yonsei Univ.)*; Choi, Ho Seon *(Daewon Univ. College)*; Lee, Kyoung Joung* *(Yonsei Univ.)*

16:32-16:34        FrDT14-01.12
**Unconstrained Measurement of Respiratory and Heart Beat using an Accelerometer**
Kang, Chang Hoon *(Yonsei University)*; Kim, Hyeonggon *(Yonsei)*; Myoung, Hyoun Seok *(Yonsei University)*; Lee, Kyoung Joung* *(Yonsei University)*

16:34-16:36        FrDT14-01.13
**Cortical Activity during Stair Walking: A Potable fNIRS Pilot Study**
Jeong, Seonyun *(DGIST)*; Yang, Seung-Tae *(DGIST)*; Jin, SangHyeon *(DGIST)*; Lee, Gihyoun *(Daegu Gyeongbuk Institute of Science and Tech.)*; Lee, Seung Hyun *(DGIST)*; Jinung, An* *(Daegu Gyeongbuk Institute of Science & Tech.)*

16:36-16:38        FrDT14-01.14
**Development of Impedance System for Electrosurgical Unit**
Lee, Duck Hee *(Biomedical Engineering Research Center, Asan Medical Center)*; Song, Seung Joon *(Asan Medical Center)*; Ho, Ye Ji *(Asan Medical Center)*; Kim, Dong Jun *(Asan Medical Center)*; Choi, Jaesoon* *(Asan Institute for Life Sciences, Asan Medical Center)*

**FrDT14-02:** 16:10-17:10        Schaldach Room
**Physiological Monitoring – Modeling and Analysis** (Poster Session)

16:10-16:12        FrDT14-02.1
**A Simulation Study for a Batteryless, Wireless Strain Sensor**
Lee, Kyeong Jae* *(Daegu Gyeongbuk Institute of Science and Technology)*; Chou, Namsun *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*; Kim, Sohee *(Daegu Gyeongbuk Institute of Science and Technology (DGIST))*

16:12-16:14        FrDT14-02.2
**Finding Optimal Position and Shape for Patch-Type ECG Sensor using Artificial neural network**
Lee, Dongseok *(Seoul National University)*; Kwon, Hyunbin *(Seoul National University)*; Lee, Hong Ji *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

16:14-16:16        FrDT14-02.3
**Determination of Proper Sensor Location to Predict Center of Pressure Trajectories**
Jung, Hyunwoo *(Sungkyunkwan University)*; Shin, Ki-Young *(Korea Electorechnology Research Institute)*; Mun, Jeffrey S. *(Swarthmore College)*; Lee, Kyungsuk *(Rural Development Administration)*; Chae, Hyeseon *(Rural Development Administration)*; Choi, Ahnryul* *(Catholic Kwandong University)*

**16:16-16:18**                     **FrDT14-02.4**

**Smartphone App Development for Mobile Phonopneumography**

Jang, Hyun Woo *(Soonchunhyang University)*; Reyes, Bersaín Alexander *(Universidad Autonoma de San Luis Potosi (UASLP))*; Ha, Sangho* *(Soonchunhyang University)*

**16:18-16:20**                     **FrDT14-02.5**

**Using Data from Connected Scales to Assess the Association between Self-Weighing Frequency and Weight Loss**

Helander, Elina *(Tampere Univ. of Tech.)*; Chieh, Angela *(Withings part of Nokia)*; Roitmann, Eva* *(Withings part of Nokia)*

**16:20-16:22**                     **FrDT14-02.6**

**Pelvic Deformation Estimation based on Analyzing Gait**

Wakaiki, Tomohiro* *(Hokkaido University)*; Tanaka, Takayuki *(Hokkaido University)*; Shimatani, Koji *(Prefectural University of Hiroshima)*; Iida, Tadayuki *(Prefectural University of Hiroshima)*; Sugiyama, Yoshimi *(Kanmon Medical Center)*; Tsuchiya, Yoshio *(Hokkaido University)*

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**FrDT14-03**: 16:10-17:10            Schaldach Room

**Physiological Monitoring – Novel Methods** (Poster Session)

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**16:10-16:12**                     **FrDT14-03.1**

**Upper Arm based Physiological Monitor for Mobile Health**

Lee, Alexander* *(University of Hawaii at Manoa)*; Gao, Xiaomeng *(University of Hawaii at Manoa)*; Xu, Jia *(University of Hawaii at Manoa)*; Yamada, Shuhei *(University of Hawaii, Manoa)*; Lubecke, Victor *(University of Hawaii Manoa)*; Boric-Lubecke, Olga *(University of Hawaii Manoa)*

**16:12-16:14**                     **FrDT14-03.2**

**Feasibility Test of Strip-Type Unconstrained Sleep Monitoring System with Polysomnography**

Park, Sooji *(Chonnam National University)*; Shin, Hangsik* *(Chonnam National University)*

**16:14-16:16**                     **FrDT14-03.3**

**Estimation of Skin Blood Flow Change in Recumbent Position using Surface-Type Photoplethysmography Sensor**

Ogawa, Sayaka* *(Kyoto University)*; Fujiwara, Koichi *(Kyoto University)*; Yamakawa, Toshitaka *(Kumamoto University)*; Kadotani, Hiroshi *(Shiga University of Medical Science)*; Matsuo, Masahiro *(Shiga University of Medical Science)*; Kano, Manabu *(Kyoto University)*

**16:16-16:18**                     **FrDT14-03.4**

**Unconstrained Foot Photoplethysmogram in Standing State**

Hong, Seunghyeok* *(Seoul National University)*; Park, Kwang S. *(Seoul National University)*

**16:18-16:20**                     **FrDT14-03.5**

**Identification of Foot Strikes with Cross-Correlation Coefficient Pattern**

Zeng, Lujie *(Southeast University)*; Mo, Lingfei* *(University of Southeast, China)*

**16:20-16:22**                     **FrDT14-03.6**

**Development of a Skin-Based Optical Biometric Device for Wearable Band Applications**

Kim, Haena *(Korea Electronics Tech. Institute)*; Kang, Jae-Hwan *(Ulsan National Institute of Science and Tech.)*; Hong, Hyuckki *(Korea Electronics Tech. Institute)*; Choi, Yeon Shik *(Korea Electronics Tech. Institute)*; Jung, Suk Won *(Korea Electronics Tech. Institute)*; Kim, Sung-Phil *(Ulsan National Institute of Science and Tech.)*; Jo, Young Chang* *(Korea Electronics Tech. Institute)*

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**FrDT14-04**: 16:10-17:10            Schaldach Room

**Portable Miniaturized Systems** (Poster Session)

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**16:10-16:12**                     **FrDT14-04.1**

**Development of the Portable Respiratory Gas Analyzer for Home Healthcare**

Seo, HyoChang *(Asan Medical Center)*; Joo, Segyeong* *(Asan Medical Center, University of Ulsan College of Medicine)*

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**FrDT15-01**: 16:10-17:10            Webster Room

**Empowering Individual Healthcare Decisions through Technology I** (Poster Session)

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**16:10-16:12**                     **FrDT15-01.1**

**Smart Mobility Solution with Multiple Input Output Interface**

Sethi, Aartika* *(IIIT Delhi)*; Deb, Sujay *(Indraprastha Institute of Information Technology, Delhi)*; Ranjan, Prabhat *(TIFAC)*; Sardar, Arghya *(TIFAC)*

**16:12-16:14**                     **FrDT15-01.2**

**Simple and Low-Cost Polymer Lens Fabrication using a Pressure-Driven Micro Chamber**

Seo, Min-Won *(Seoul National Univ.)*; Koo, Kyoin *(Univ. of Ulsan)*; Seo, Jong Mo* *(Seoul National Univ., School of Eng.)*

**16:14-16:16**                     **FrDT15-01.3**

**Proposal of Custom Made Wrist Orthoses based on 3D Modelling and 3D Printing**

Abreu de Souza, Mauren* *(Federal University of Technology – Paraná (UTFPR))*; Schmitz, Cristiane *(Federal University of Technology – Paraná (UTFPR))*; Marega Pinhel, Marcelo *(UTFPR)*; Palma Setti, João *(UTFPR)*; Nohama, Percy *(Universidade Tecnologica Federal do Parana)*

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**FrDT15-03**: 16:10-17:10            Webster Room

**Empowering Individual Healthcare Decisions through Technology** (Poster Session)

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**16:10-16:12**                     **FrDT15-03.1**

**Design a Capacitive Sensor of the Liquid Volume Measurement for Smart Cup Development**

Kim, Mijung *(Keimyung University)*; Wei, Qun* *(Keimyung University)*; Park, Hee-Jun *(Keimyung University)*

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**FrDT15-04**: 16:10-17:10            Webster Room

**Medical Technology – Clinical Testing/ Clinical Trials** (Poster Session)

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**16:10-16:12**                     **FrDT15-04.1**

**Enhanced Reality for Post-Operative Analgesia**

Hwang, Changho *(Ulsan Univ. Hospital)*; Park, Dae Kwon *(Ulsan Univ. Hospital)*; Cho, Sung Do *(Ulsan Univ. Hospital)*; Choi, Myounghwan *(Univ. of Ulsan)*; Lee, Yeasol *(Univ. of Ulsan)*; Duong Van, Thuy *(Univ. of Ulsan)*; Kim, Changsik *(Univ. of Ulsan)*; Phan, Huu Lam *(Biomedical Engineering Dept., Ulsan Univ., Korea)*; Nguyen, Trung *(Univ. of Ulsan)*; Cheon, Jae Yeong *(Univ. of ulsan)*; Lee, YongKwan *(Univ. of Ulsan)*; Park, Hodong *(Ulsan Univ.)*; Shin, Daehyeon *(Univ. of Ulsan)*; Koo, Kyoin* *(Univ. of Ulsan)*

**16:12-16:14**                     **FrDT15-04.2**

**A Clinical Study Comparing Horizontal Localization Benefits of RIC and CIC Hearing Aids for Sensorineural Hearing Loss Subjects**

Kim, Min-Ah *(Sungkyunkwan University)*; Lim, Yerin *(Samsung Medical Center)*; Cho, Yang-sun* *(Sungkyunkwan University)*

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**FrDT15-05**: 16:10-17:10            Webster Room

**Medical Technology – Clinical Workflow Analysis** (Poster Session)

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**16:10-16:12**                     **FrDT15-05.1**

**Development of a Measuring System for Measuring Carpal Joint Motion using the Actual Reality**

Choi, Han-Sol *(Gachon University)*; Kim, Young Jae *(Gachon University)*; Kim, Kwang Gi* *(Gachon University)*; Lee, Sanglim *(Sanggye Paik Hospital, Inje University)*; Ha, Jiyun *(Inje University, Sanggye Paik Hospital)*

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**FrDT15-06**: 16:10-17:10            Webster Room

**Medical Technology – Design and Development** (Poster Session)

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**16:10-16:12**                     **FrDT15-06.1**

**Multi-Ultra-Sounds Stimulation Equipment for Medical Home Health Care**

Yamashita, Yohachi* *(Kaikai Co. Ltd)*; Lee, Ho Yong *(Ceracomp Co. Ltd)*; Xue, Genfei *(Zhejiang Jiakang Electronics Co., Ltd)*; Ni, Penfei *(Zhejiang Jiakang Electronics Co., Ltd)*

16:12-16:14               FrDT15-06.2
**Design Exploration for Patient Specific Pedicle Screw**
Khatri, Ravi* *(Indian Institute of Technology Madras)*; Varghese, Vicky *(Indian Institute of Technology, Madras)*; Saravana Kumar, Gurunathan *(Indian Institute of Technology, Madras)*

16:10-16:12               FrDT15-07.1
**Measurement of Anatomical Parameters with Lumbar Spine for Vertebral Body Replacement System**
Kwan-Su, Kang *(OSONG Medical Innovation Foundation)*; Jeong, Yong-Hoon *(OSONG Medical Innovation Foundation)*; Park, Kwang-Min *(OSONG Medical Innovation Foundation)*; Lee, Suwon *(OSONG Medical Innovation Foundation)*; Yang, Jae-Woong *(OSONG Medical Innovation Foundation)*; Jeong, Jae-Young *(OSONG Medical Innovation Foundation)*; Jung, Tae-Gon* *(OSONG Medical Innovation Foundation)*

16:10-16:12               FrDT15-08.1
**Standardization on Computerized Tongue Image Analysis Systems**
Kim, Jihye *(Korea Institute of Oriental Medicine)*; Kim, Keun Ho* *(Korea Institute of Oriental Medicine)*

16:12-16:14               FrDT15-08.2
**A Study on Label Management for Medical Device Characteristics**
Song, Seung Joon *(Asan Medical Center)*; Lee, Duck Hee* *(Biomedical Engineering Research Center, Asan Medical Center)*; Song, YeEun *(Yonsei University)*; Ahn, Chi Bum *(Gachon University)*; Lee, Sungho *(Korea University)*

16:14-16:16               FrDT15-08.3
**Design on Bi-Layers Structure Containing Non-Toxic Materials for Improvement of Performance of Special Radiation Shielding Garments**
Kim, Kyotae *(Dept. of Biomedical Eng., Inje Univ.)*; Han, Moojae *(Dept. of Biomedical Eng., Inje Univ.)*; Heo, Yeji *(Biomedical Eng., Inje Univ.)*; Jun, Jaehoon *(Dept. of Radiological Science, Intl. Univ. of Korea)*; Yang, Sungwoo *(Dept. of Radiological Science, Intl. Univ. of Korea)*; Kang, Subin *(Dept. of Radiological Science, Intl. Univ. of Korea)*; Kang, Sangsik *(Dept. of Radiological Science, Intl. Univ. of Korea)*; Park, Jikoon* *(Dept. of Radiological Science, Intl. Univ. of Korea)*

16:16-16:18               FrDT15-08.4
**Design of Double Layer Shielding Sheet using Eco-Friendly Inorganic Materials**
Kang, Sangsik *(Dept. of Radiological Science, International Univ. of Korea)*; Jun, Jaehoon *(Dept. of Radiological Science, International Univ. of Korea)*; Yang, Sungwoo *(Dept. of Radiological Science, International Univ. of Korea)*; Kang, Subin *(Dept. of Radiological Science, International Univ. of Korea)*; Kim, Kyotae *(Dept. of Biomedical Engineering, Inje Univ.)*; Choi, Ilhong *(Dept. of Radiological Science, International Univ. of Korea)*; Park, Jikoon* *(Dept. of Radiological Science, International Univ. of Korea)*

16:18-16:20               FrDT15-08.5
**Evaluation of Safety and Performance in Alarm System for Electrosurgical Device**
Choi, Jaesoon* *(Asan Institute for Life Sciences, Asan Medical Center)*; Ho, Ye Ji *(Asan Medical Center)*; Lee, Duck Hee *(Biomedical Engineering Research Center, Asan Medical Center)*; Park, Sanghoon *(Asan Medical Center)*; Jo, Kyungmin *(Asan Institute for Life Sciences, Asan Medical Center)*; Choi, Bareum *(Asan Institute for Life Sciences, Asan Medical Center)*; Park, Sang-Eun *(Biomedical Engineering Research Center, Asan Medical Center)*; You, Hyeonseok *(University of Ulsan)*; Kim, Dong Jun *(Asan Medical Center)*

16:20-16:22               FrDT15-08.6
**Evaluation of Safety and Performance in Alarm System for Infusion Pump**
Choi, Jaesoon* *(Asan Institute for Life Sciences, Asan Medical Center)*; Ho, Ye Ji *(Asan Medical Center)*; Lee, Duck Hee *(Biomedical Engineering Research Center, Asan Medical Center)*; Park, Sanghoon *(Asan Medical Center)*; Jo, Kyungmin *(Asan Institute for Life Sciences, Asan Medical Center)*; Choi, Bareum *(Asan Institute for Life Sciences, Asan Medical Center)*; Park, Sang-Eun *(Biomedical Engineering Research Center, Asan Medical Center)*; You, Hyeonseok *(Univ. of Ulsan)*; Kim, Dong Jun *(Asan Medical Center)*

16:22-16:24               FrDT15-08.7
**The Safety and Effectiveness of 24-H Intraocular Pressure Monitoring Contact Lens Sensor – Systematic Review**
Hong, Youna *(Samsung Advanced Institute for Health Science & Technology, Sung)*; Lee, Seon Heui* *(Gachon University)*

16:10-16:12               FrDT15-09.1
**Software Design and Development for Respiratory Analysis System**
Kwon, Jeonghoon *(Asan Medical Center)*; Seo, HyoChang *(Asan Medical Center)*; Joo, Segyeong* *(Asan Medical Center, University of Ulsan College of Medicine)*

16:10-16:12               FrDT15-10.1
**Mobile-Based Evaluation of Latent Tuberculosis Infection**
Safa Naraghi, Safa Kagiso* *(University of Cape Town)*; Mutsvangwa, Tinashe Ernest Muzvidzwa *(University of Cape Town)*; Rangaka, Molebogeng *(University College London)*; Douglas, Tania S *(University of Cape Town)*

16:10-16:12               FrDT15-14.1
**High-Throughput Single-Cell Isolation by Nanosecond Pulsed Laser for Cancer Genome Analysis**
Kim, Sungsik* *(Interdisciplinary Program for Bioengineering, Seoul Natl. Uni)*; Kim, Jinhyun *(Dept. of Electrical and Computer Engineering, Seoul Nationa)*; Lee, Amos Chungwon *(Interdisciplinary Program for Bioengineering, Seoul Natl. Uni)*; Jung, Yushin *(Dept. of Electrical and Computer Engineering, Seoul Nationa)*; Bae, Sangwook *(Interdisciplinary Program for Bioengineering, Seoul Natl. Uni)*; Kwon, Sunghoon *(Dept. of Electrical and Computer Engineering, Seoul Nationa)*

16:10-16:12               FrDT16-01.1
**Wool-PTFE Triboelectric Sensor for Respiratory Rate Detection**
Padasdao, Bryson* *(Univ. of Hawaii at Manoa)*; Barit, Dexter James *(Univ. of Hawaii at Manoa)*; Hancock, Lyra *(Univ. of Hawaii at Manoa)*; Nakamura, Jillian *(Univ. of Hawaii at Manoa)*; Boric-Lubecke, Olga *(Univ. of Hawaii Manoa)*

16:12-16:14               FrDT16-01.2
**A Comparison and Evaluation between Textile Capacitive Proximity Sensor and F-Scan**
Wang, Changwon *(Soonchunhyang Univ.)*; Ho, Jong Gab *(SoonChunHyang Univ.)*; Kwak, Jaekyung *(Chonnam National Univ.)*; Min, Se Dong* *(SoonChunHyang Univ.)*

16:14-16:16               FrDT16-01.3
**Detachable Electric Button for Wearable Fabrics**
Lee, Kang-Ho* *(Korea Institute of Machinery & Materials)*; Cha, Ju Young *(Korea Institute of Machinery & Materials)*; Lee, Dongkyu *(Korea Institute of Machinery & Materials)*; Kwon, Ohwon *(Korea Institute of Machinery & Materials)*; Lee, Yongkoo *(Korea Institute of Machinery & Materials)*

16:16-16:18            FrDT16-01.4

**Preliminary Study of ECG-Based Human Authentication using Capacitively Coupled Textile Electrodes on a Bed**

Kim, Jeehoon *(Seoul National University)*; Sung, Dongsuk *(Seoul National University)*; Lee, Hong Ji *(Seoul National University)*; Park, Kwang S.* *(Seoul National University)*

**Wearable Antennas and In-Body Communications** (Poster Session)

16:10-16:12            FrDT16-02.1

**Real-Time Wireless Respiratory Monitoring using Wearable Inertial Motion Sensor Network**

Gaidhani, Apoorva *(San Diego State Univ.)*; Moon, Kee* *(San Diego State University)*; Ozturk, Yusuf *(San Diego State University)*; Lee, Sung Q *(ETRI)*; Youm, Woosub *(ETRI)*

16:12-16:14            FrDT16-02.2

**Wireless Information Transmission using Capacitive Coupling while Transmitting Data from the Inside to the Outside of the Human Body: Optimization of Cutoff Frequency in the Receiving Filter Circuit**

Shingo, Kouki* *(Tokyo University of science)*; Shiba, Kenji *(Tokyo University of Science)*; Hara, Kazuhiro *(KOA Corporation)*; Tsuboki, Mitsuo *(KOA Corporation)*; Ito, Masakazu *(KOA Corporation)*

**FrDT16-03: 16:10-17:10            Rushmer Room**
**Wearable Body-Compliant, Flexible and Printed Electronics** (Poster Session)

16:10-16:12            FrDT16-03.1

**Thermoplastically Shaped Wearable Medical Devices**

Plovie, Bart* *(Centre for Microsystems Tech. (imec - Ghent Univ.))*; Bossuyt, Frederick *(TFCG IMEC Ghent)*; Vanfleteren, Jan *(IMEC / Ghent Univ.)*; Van Put, Steven *(INTEC)*; Dunphy, Sheila *(CMST (UGent - imec))*; Vandecasteele, Bjorn *(IMEC)*; Dhaenens, Kristof *(CMST (UGent - imec))*

16:12-16:14            FrDT16-03.2

**Advanced Method for Continuous Denoising of Far-Field Arm-ECG Bipolar Lead Data using Empirical Mode Decomposition**

Lynn, William David *(Ulster University)*; McEneaney, David *(Craigavon Area Hospital)*; Villegas, Ricardo *(Universidad de Carabobo.)*; Escalona, Omar Jacinto* *(University of Ulster)*

16:14-16:16            FrDT16-03.3

**Quantification of a Wearable Contactless Sensor using an Expansion/Contraction Simulator Rig**

Shabani Varaki, Elham *(Western Sydney University)*; Gargiulo, Gaetano *(The MARCS Institute (University of Western Sydney))*; Breen, Paul P* *(Western Sydney University)*

16:16-16:18            FrDT16-03.4

**Carbon based Dry Electrode for Wearable Patch Devices**

Jung, Hachul* *(KBIO)*; Ahn, Jin Woo *(KBIO)*; Lee, Sanghun *(Osong Medical Innovation Foundation)*; Moon, Jin-hee *(Medical Device Development Center of Osong Medical Innovation Fo)*; Kwon, Dahye *(KBIO)*

16:18-16:20            FrDT16-03.5

**Parallel Mechanism using Stretchable Strain Sensor for Lumbar Motion Measurement**

Nakamoto, Hiroyuki* *(Kobe University)*; Yamaji, Tokiya *(Kobe University)*; Yamamoto, Akio *(Kobe University)*; Ootaka, Hideo *(Bando Chemical Industries, LTD)*; Bessho, Yusuke *(Bando Chemical Industries, LTD)*; Ono, Rei *(Kobe University)*

**FrDT16-04: 16:10-17:10            Rushmer Room**
**Wearable Low Power, Wireless Sensing Methods** (Poster Session)

16:10-16:12            FrDT16-04.1

**A Wireless, Wearable Sensor System for Symmetry in Gait Analysis**

Marquez, Juan S.* *(Florida International Univ.)*; Atri, Roozbeh *(Florida International Univ.)*; Bai, Ou *(Florida International Univ.)*

**FrDT16-05: 16:10-17:10            Rushmer Room**
**Wearable Power and On-Body Energy Harvesting** (Poster Session)

16:10-16:12            FrDT16-05.1

**CMOS-Based Optical Energy Harvesting Circuit for Medical and IoT Devices**

Wuthibenjaphonchai, Nattakarn *(Nara Inst. of Science and Tech.)*; Haruta, Makito *(Nara Inst. of Science and Tech.)*; Noda, Toshihiko *(Nara Inst. of Science and Tech.)*; Sasagawa, Kiyotaka *(Nara Inst. of Science and Tech.)*; Tokuda, Takashi* *(Nara Inst. of Science and Tech.)*; Sawan, M. *(Polytechnique Montreal)*; Ohta, J. *(Nara Inst. of Science and Tech.)*

16:12-16:14            FrDT16-05.2

**Wearable Implementation of Human-Powered Energy Harvester for Trickle Charging of Mobile Devices with Minimal Engagement**

Yeo, Jeongjin *(Chonbuk National University)*; Yang, Yoonseok* *(Chonbuk National University)*

16:14-16:16            FrDT16-05.3

**Respiratory Sensing and Energy Scavenging Improvements with Chest and Abdomen Dual-Band Biosensors**

Padasdao, Bryson* *(Univ. of Hawaii at Manoa)*; Shahhaidar, Ehsaneh *(IncubeLabs)*; Stickley, Cris *(Univ. of Hawaii at Manoa)*; Boric-Lubecke, Olga *(Univ. of Hawaii Manoa)*

**Wearable Sensor Systems – User Centered Design and Applications** (Poster Session)

16:10-16:12            FrDT16-06.1

**Augmented Reality as a Medical Diagnosis and Surgical Planning Tool**

Chen, Jackie *(Univ. of Illinois- Urbana-Champaign)*; Pareek, Shrey *(Univ. of Illinois at Urbana-Champaign)*; Chembrammel, Pramod *(Univ. of Illinois at Urbana-Champaign)*; Kesavadas, Thenkurussi* *(Univ. of Illinois at Urbana-Champaign)*

16:12-16:14            FrDT16-06.2

**Green Light Photoplethysmography in the Ear for Measuring Pulse Rate in Daily Life using an Earphone**

Kusaba, Shihori *(Fukuoka Institute of Tech.)*; Fukumoto, Yuto *(Fukuoka Institute of Tech.)*; Lee, Jihyoung* *(Fukuoka Institute of Tech.)*; Rolfe, Peter *(Oxford BioHorizons Ltd)*; Yamakoshi, Takehiro *(Fukuoka Institute of Tech.)*

16:14-16:16            FrDT16-06.3

**Wearable EEG V.s. Wristband: Which is More Accurate for Sleep Tracking under Free Living Conditions?**

Liang, Zilu* *(The University of Tokyo)*; Chapa Martell, Mario Alberto *(CAC Corporation)*

16:16-16:18            FrDT16-06.4

**Data Glove for Sign Language Translation using Conductive Fabric**

Okada, Yuki* *(Kindai University)*; Okada, Shima *(Ritsumeikan University)*; Ioi, Kiyoshi *(Kindai University)*

16:18-16:20            FrDT16-06.5

**Development of Processing System for Visually System based on Auditory Input**

Kim, Junghun *(Kyungpook Natl. Univ.,)*; Park, Jieun *(Kyungpook Natl. Univ.)*; Ji, In Hee *(Deagu)*; Won, Chulho *(Univ. of Kyungil)*; Park, YuJin *(Kyungpook Natl. Univ.)*; Nah, Jaewook *(Jeyun Medical Inc.)*; Lee, Jongmin* *(Kyungpook Natl. Univ.)*

16:20-16:22            FrDT16-06.6

**Internet of the Body: Wearable Devices and Cognitive Computing for a Personal Medical Advisor**

Straessle, R. *(IBM Research - Zurich)*; Gerke, S. *(IBM Research - Zurich)*; Brunschwiler, T. *(IBM Research - Zurich)*; Temiz, Y. *(IBM Research-Zurich)*; Weiss, J. *(IBM Research - Zurich)*; Sridhar, A. *(IBM Research - Zurich)*; Paredes, S. *(IBM Research - Zurich)*; Loertscher, E. *(IBM Research - Zurich)*; Ebejer, N. *(IBM Research - Zurich)*; Faro, I. *(IBM Watson Research Lab)*; van Kessel, T. *(IBM Watson Research Lab)*; Meghelli, M. *(IBM Watson Research Lab)*; Taubenblatt, M.A. *(IBM Watson Research Lab)*; Zafar, S. *(IBM Watson Research Lab)*; Libsch, F. *(IBM Watson Research Lab)*; Matsumoto, K. *(IBM Research Tokyo)*; Michel, B.* *(IBM Research - Zurich)*

**July 14 Friday**

**16:22-16:24**  FrDT16-06.7

**A Wearable and Distributed Human Physiological Condition Monitoring System**

Cheng, Shuo *(Harbin Institute of Tech. ShenZhen)*; Chen, Yang *(Harbin Institute of Tech. Shenzhen Graduate School)*; Ma, Heather Ting\* *(Harbin Institute of Tech. Shenzhen Graduate School)*; Li, Jie *(Harbin Institute of Tech. Shenzhen Graduate School)*; Lian, Jiayuan *(Harbin Institute of Tech.)*

**16:24-16:26**  FrDT16-06.8

**Surface Electromyogram Measurement E-Textile for the Wearable Periodic Limb Movement Home Monitoring System**

Eguchi, Kana\* *(Kyoto Univ.)*; Nambu, Masayuki *(Kyoto Univ. Hospital)*; Murase, Kimihiko *(Kyoto Univ. Hospital)*; Chin, Kazuo *(Univ.)*; Kuroda, Tomohiro *(Kyoto Univ.)*

**16:26-16:28**  FrDT16-06.9

**Unobtrusive Device for Heartbeat Measurement based on Ballistocardiogram**

Park, Chan-Yong\* *(My Mobile)*

**16:28-16:30**  FrDT16-06.10

**Research for Patch Type Wireless Bio-Signal Detecting System**

Chang, Hojong\* *(Institute for Information Technology Convergence, KAIST)*; Kim, Ki-duk *(Sun Medical Center)*; Han, Byunghun *(KAIST)*; Lim, Taeyoon *(Doohaine Co., Ltd.)*; Nam, Hyoung Ho *(E-ONE Co., Ltd.)*; Kim, Hyunduk *(KAIST)*

**16:30-16:32**  FrDT16-06.11

**Touch-Sensitive Capacitive Smart Glove (TSCS)**

Marjanovic, N.\* *(Univ. of Illinois at Chicago)*; Pandya, S. *(Univ. of Illinois at Chicago)*; Anderson, N. *(Univ. of Illinois at Chicago)*; Esmailbeigi, H. *(Univ. of Illinois at Chicago (UIC))*

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**FrDT16-07:** 16:10-17:10  Rushmer Room

**Wearable Wireless Sensors, Motes and Systems** (Poster Session)

**16:10-16:12**  FrDT16-07.1

**Detection of Hemiplegic Gait using 6-Axis Inertial Sensor**

Lee, Jun Seok *(Chonnam Natl. Univ.)*; Park, Sooji *(Chonnam Natl. Univ.)*; Shin, Hangsik\* *(Chonnam Natl. Univ.)*

**16:12-16:14**  FrDT16-07.2

**Posture Reminding Effect using a Wearable Neck Posture Tracker**

Lee, Jaehyun *(University of Ulsan)*; Dang, Quoc Khanh *(University of Ulsan)*; Chee, Youngjoon\* *(University of Ulsan)*

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**FrDT17-01:** 16:10-17:10  Einthoven Hall

**Connectivity Measurements** (Poster Session)

**16:10-16:12**  FrDT17-01.1

**Low Beta (10-20Hz) Coherence within Fronto-Parietal Network during Visual Reaching Task in Non-Human Primates**

Lee, Jeyeon *(Hanyang Univ.)*; Choi, Hoseok *(Hanyang Univ.)*; Lee, Seho *(Hanyang Univ.)*; Jang, DongPyo\* *(Hanyang Univ.)*

**16:12-16:14**  FrDT17-01.2

**A Human ECoG Study for Fronto-Parietal Preparatory Networks**

Park, Young Min *(Hanyang Univ.)*; Hwang, Jong Ho *(Hanyang Univ.)*; Kim, Juri *(Hanyang Univ.)*; Park, J. *(Hanyang Univ.)*; Kim, I.-Y. *(Hanyang Univ.)*; Jang, D.P.\* *(Hanyang Univ.)*

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**FrDT17-02:** 16:10-17:10  Einthoven Hall

**Directionality** (Poster Session)

**16:10-16:12**  FrDT17-02.1

**Development of a Guidance Catheter**

Fourie, Christoffel Johannes Adriaan\* *(Innovation4life)*; Van Der Merwe, Johan *(Stellenbosch Univ.)*; Van Der Merwe, Tys *(Stellenbosch Univ.)*; Fourie, P.R. *(Stellenbosch Univ.)*

**16:12-16:14**  FrDT17-02.2

**Versatility of a Nonlinear Interdependence Method for Directional Coupling Detection from Spike Trains**

Malvestio, Irene\* *(Univ. Pompeu Fabra, Barcelona)*; Kreuz, Thomas *(National Research Council (CNR))*; Andrzejak, Ralph *(Computational Neuroscience Group, Dept. of Information)*

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**FrDT17-03:** 16:10-17:10  Einthoven Hall

**Nonlinear Dynamic Analysis – Biomedical Signals** (Poster Session)

**16:10-16:12**  FrDT17-03.1

**Pneumo Reduction Device**

Cho, S.I. *(Kyungpook Natl. Univ.)*; Kim, J. *(Kyungpook Natl. Univ.,)*; Park, J. *(Kyungpook Natl. Univ.)*; Park, Y.J. *(Kyungpook Natl. Univ.)*; Lee, J.\* *(Kyungpook Natl. Univ.)*

**16:12-16:14**  FrDT17-03.2

**Quantitative EEG in Mild Cognitive Impairment by AR Spectral and Multi-Scale Entropy Analysis**

Chai, Xiaoke *(Beihang Univ.)*; Zhang, Zhimin *(Beihang Univ.)*; Cao, Guiming *(Beihang Univ.)*; Lu, YangTing *(BUAA)*; Liu, Guitong *(Beihang Univ.)*; Niu, Haijun\* *(Beihang Univ.)*

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**FrDT17-05:** 16:10-17:10  Einthoven Hall

**Physiological Systems Modeling – Closed Loop Systems** (Poster Session)

**16:10-16:12**  FrDT17-05.1

**Hybrid Design Architecture for Closed-Loop Deep Brain Stimulation on Cognitive-Enhancing Rodent Model**

Wang, Ching-Fu *(National Yang-Ming Univ.)*; Chou, Yi-Ting *(National Yang-Ming Univ.)*; Chou, Chin *(National Yang-Ming Univ.)*; Li, Ssu-Ju *(National Yang-Ming Univ.)*; Chen, Hsu-Yan *(National Yang-Ming Univ.)*; Lin, Ting-Chun *(YMU)*; Chen, Pochuan *(National Yang-Ming Univ.)*; Lai, Hsin-Yi *(Zhejiang Univ.)*; Chen, You-Yin\* *(National Chiao-Tung Univ.)*

**16:12-16:14**  FrDT17-05.2

**Waveform Control Technique to make Specific Shape of Voltammogram in Fast-Scan Cyclic Voltammetry**

Kang, Yumin *(Hanyang Univ.)*; Shin, Hojin *(Hanyang Univ.)*; Park, CheonHo *(Hanyang Univ.)*; Cho, Hyunwoo *(Hanyang Univ.)*; Jang, D.P.\* *(Hanyang Univ.)*; Kim, I.-Y. *(Hanyang Univ.)*

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**FrDT17-06:** 16:10-17:10  Einthoven Hall

**Nonlinear Dynamic Analysis – Deterministic Chaos** (Poster Session)

**16:10-16:12**  FrDT17-06.1

**Age Related Changes in Green Light Photoplethysmogram Dynamics**

Sviridova, Nina\* *(Meiji University)*; Nakamura, Kazuyuki *(Meiji University)*; Zhao, Tiejun *(National Agriculture and Food Research Organization)*; Nakano, Akimasa *(National Agriculture and Food Research Organization)*

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**FrDT17-07:** 16:10-17:10  Einthoven Hall

**Physiological Systems Modeling – Multivariate Signal Processing** (Poster Session)

**16:10-16:12**  FrDT17-07.1

**Modeling Firing Pattern of SA Afferents in Response to Constant Pressure Stimulation**

Park, Jisung\* *(Ulsan National Institute of Science and Technology)*; Jung, Sung Jun *(Hanyang University)*; Kim, Jinsoo *(UNIST)*; Kim, Sung-Phil *(Ulsan National Institute of Science and Technology)*

**16:12-16:14**  FrDT17-07.2

**New Ways to Evaluate Neuronal Population Coding using Spike Train Distances**

Kreuz, Thomas\* *(National Research Council (CNR))*; Satuvuori, Eero *(Institute of Complex Systems, CNR)*; Mulansky, Mario *(Institute for complex systems (ISC), National Research Council*

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**FrDT17-08:** 16:10-17:10  Einthoven Hall

**Physiological Systems Modeling – Signal Processing in Physiological Systems** (Poster Session)

**16:10-16:12**  FrDT17-08.1

**MCA-Based Denosing for In-Vehicle EEG Measurements to Estimate the Driver's Mental Workload Influenced by Distractions**

Ichiki, Mayu\* *(Kyushu Institute of Tech.)*; Singh, Balbir *(Kyushu Institute of Tech.)*; Ai, Guangyi *(Neusoft Institute Guangdong)*; Wagatsuma, Hiroaki *(Kyushu Institute of Tech.)*

**16:12-16:14**                    FrDT17-08.2

**Constrained Optimization for Synthesizing Pulsating Blood Volume Waveforms from Video Cameras**
Seenumani, Gayathri *(GE Global Research)*; Block, Robert *(Univ. of Rochester Medical Center)*; Mukkamala, R.* *(Michigan State Univ.)*; Mestha, Lalit, K. *(GE Global Research)*

**16:14-16:16**                    FrDT17-08.3

**A High-Precision Skilled Movement Evaluation by using Curvature Analysis in the Simultaneous Recording of 3D Motion Capture System and Intracranial Video-EEG Monitoring and Stimulation**
Maniamma, Jisha* *(Kyushu Institute of Tech.)*; Hagio, Motoharu *(Kyushu Institute of Tech.)*; Togo, Masaya *(Kyoto Univ. Grad. School of Medicine)*; Shimotake, Akihiro *(Kyoto Univ. Grad. School of Medicine)*; Matsumoto, Riki *(Kyoto Univ. Grad. School of Medicine)*; Ikeda, Akio *(Kyoto Univ. Grad. School of Medicine)*; Wagatsuma, Hiroaki *(Kyushu Institute of Tech.)*

**16:16-16:18**                    FrDT17-08.4

**Investigation of the Photoplethysmography Waveform According to the Nociceptive Pain**
Yang, Yoon La *(Chonnam National University)*; Shin, Hangsik* *(Chonnam National University)*

**16:18-16:20**                    FrDT17-08.5

**Novel Sleep Indicator of Heart Rate Variability: Power Concentration Index of High-Frequency Component**
Hayano, Junichiro* *(Nagoya City Univ.)*; Yuda, Emi *(Nagoya City Univ. Grad. School of Medical Sciences)*; Yoshida, Yutaka *(Nagoya City Univ. Grad. School of Medical Sciences)*

**16:20-16:22**                    FrDT17-08.6

**Estimation of Bladder Fullness from Electrical -Bioimpedance**
Wang, Qian* *(sun yat-sen Univ.)*; Kunyang, Li *(Sun yat-sen Univ.)*

**16:22-16:24**                    FrDT17-08.7

**Thigh EMG and Skin Temperature Variation during Increasing-Load Cycling Exercises**
Gelain, Manuela Cristine *(University Tecnological Federal of Parana)*; Nogueira-Neto, Guilherme *(Pontificia Universidade Catolica do Parana)*; Abreu de Souza, Mauren *(Federal University of Technology – Paraná (UTFPR))*; Nohama, Percy* *(Universidade Tecnologica Federal do Parana)*

**16:24-16:26**                    FrDT17-08.8

**The Advantage of Topographic Prominence–adapted Filter for the Detection of Short-Latency Spikes of Retinal Ganglion Cells**
Ahn, Jungryul *(Chungbuk Natl. Univ.)*; Choi, Myounghwan *(Univ. of Ulsan)*; Cha, Seongkwang *(Chungbuk Natl. Univ.)*; Kim, Changsik *(Univ. of Ulsan)*; Kim, Kwangsoo *(Hanbat Natl. Univ.)*; Cho, Dong Il *(Seoul Natl. Univ.)*; Koo, Kyoin* *(Univ. of Ulsan)*; Goo, Y.S. *(Chungbuk Nati Univ School of Medicine)*

**16:26-16:28**                    FrDT17-08.9

**Near Infrared Spectrum based Biometric Authentication**
Thangappan, Anandaraj* *(Wipro Limited)*; Susha Nair, Aravind *(Wipro Limited)*

**16:28-16:30**                    FrDT17-08.10

**Using Quantitative Metrics for Comparing Lower Limbs Multibody Dynamics Estimated Action and Measured EMG at Locomotion**
Rodrigues, Carlos M. B.* *(INESCTEC - Tech. & Science Associate Lab.)*; Correia, Miguel *(Univ. do Porto, Faculdade de Engenharia)*; Abrantes, João M. C. S. *(MovLab - ULHT)*; Nadal, Jurandir *(Federal Univ. of Rio de Janeiro)*; Rodrigues, Marco Aurélio Benedetti *(Federal Univ. of Pernambuco)*

**FrDT17-09:  16:10-17:10**                    Einthoven Hall
**Physiological Systems Modeling – Signals and Systems** (Poster Session)

**16:10-16:12**                    FrDT17-09.1

**Speech Enhancement Strategy based on Noise Classification and Optimal Noise Estimation Parameters**
Jeon, Yuyong *(INHA Univ.)*; Sun Kwon, Kim *(Korea ElectroTech. Research Institute)*; Park, Yuongjin *(Korea ElectroTech. Research Institute)*; Lee, Sangmin* *(INHA Univ.)*

**16:12-16:14**                    FrDT17-09.2

**Synthesis of Vocal Jitter**
Jo, Cheolwoo* *(Changwon National University)*

**FrDT18-01:  16:10-17:10**                    Montgomery Hall
**Data Mining and Processing – Pattern Recognition** (Poster Session)

**16:10-16:12**                    FrDT18-01.1

**Early Recognition of Speech Disturbance in a Mobile Stroke Triage System**
Shin, Yeongcheol *(Health-IT Acceleration Center, Yonsei University College of Medi)*; Nam, Gibaek *(Health-IT Acceleration Center, Yonsei University College of Medi)*; Park, Eunjeong *(Cardiovascular Research Institute, Yonsei University College of)*; Nam, Hyosuk *(Dept. of Neurology, Yonsei University College of Medicine)*; Chang, Hyuk-Jae* *(Dept. of Internal Medicine, Severance Cardiovascular Hospit)*

**16:12-16:14**                    FrDT18-01.2

**Extraction of Brain Cortical Activities Related to Auditory Impressions Induced by HVAC Sound using Nonnegative Tensor Factorization**
Yano, Hajime* *(Kobe University)*; Takiguchi, Tetsuya *(Kobe University)*; Ariki, Yasuo *(Kobe University)*; Kamiya, Masaru *(Denso Corporation)*; Nakagawa, Seiji *(Chiba University)*

**FrDT18-02:  16:10-17:10**                    Montgomery Hall
**Data Mining and Processing in Biosignals** (Poster Session)

**16:10-16:12**                    FrDT18-02.1

**The Design of Outlier Removal Method for Effective Negative Emotion Classification using Bio-Signal**
Lee, JeeEun *(Yonsei Univ.)*; Kim, Byeongnam *(Yonsei Univ.)*; Jang, Wonseuk *(Yonsei Univ.)*; Lim, Hyunjun *(Yonsei Univ.)*; Oh, Kyeong Taek *(Yonsei Univ.)*; Kwon, JunHwan *(Yonsei Univ.)*; Yoo, Sun K.* *(Yonsei Univ. Health System)*

**FrDT18-03:  16:10-17:10**                    Montgomery Hall
**Independent Component Analysis** (Poster Session)

**16:10-16:12**                    FrDT18-03.1

**Independent Component Analysis based Symmetric Signal Leakage Correction for Source Reconstructed MEG Data**
Gohel, Bakul* *(Korea Research Institute of Standards and Science (KRISS))*; Lim, Sanghyun *(Korea Research Institute of Standards and Science (KRISS) and Un)*; Kim, Kiwoong *(Korea Research Institute of Standards and Science)*

**16:12-16:14**                    FrDT18-03.2

**Heart Rate Estimation from Facial Videos based on ICA with Reference**
Umematsu, Terumi* *(NEC Corp.)*; Tsujikawa, M. *(NEC Corp.)*

**FrDT18-05:  16:10-17:10**                    Montgomery Hall
**Principal Component Analysis** (Poster Session)

**16:10-16:12**                    FrDT18-05.1

**Pupil Diameter Changes Related to Interest Value of Visual Stimuli**
Yoshida, Anna *(Waseda Univ.)*; Momose, Keiko* *(Waseda Univ.)*

**16:12-16:14**                    FrDT18-05.2

**Multi-Stage Singular Spectrum Analysis based Heart Sound Denoising using Wavelet Packet Transform**
Zheng, Yineng *(Chongqing University)*; Guo, Xingming* *(Chongqing University)*

**16:14-16:16**                    FrDT18-05.3

**Feature Extraction of EEG Signals in Concentrated State using ICA**
Kim, Byeongnam *(Yonsei Univ.)*; Lee, JeeEun *(Yonsei Univ.)*; Lim, Hyunjun *(Yonsei Univ.)*; Kim, Sangkyu *(Yonsei Univ.)*; Kim, Han Woong *(Yonsei Univ.)*; Jang, Wonseuk *(Yonsei Univ.)*; Yoo, Sun K.* *(Yonsei Univ. Health System)*

**FrDT18-06:** 16:10-17:10      Montgomery Hall
**Time-Frequency and Time-Scale Analysis – Empirical mode Decomposition in Biosignal Analysis** (Poster Session)

16:10-16:12      FrDT18-06.1
**Removal of Drift and Blink Artifacts in EEG based on Sparse Morphological Decomposition**
Singh, Balbir *(Kyushu Institute of Technology)*; Ichiki, Mayu* *(Kyushu Institute of Technology)*; Wagatsuma, Hiroaki *(Kyushu Institute of Technology)*

16:12-16:14      FrDT18-06.2
**Classification of Ictal Interictal EEG Signals based on Bandwidth Features and their Ratio**
Mahapatra, Arindam Gajendra* *(Life science and System Engineering, Kyutech)*; Horio, Keiichi *(Kyushu Institute of Tech.)*

16:14-16:16      FrDT18-06.3
**Quantitative EEG as a Predictor of Prognosis in First Episode Psychosis**
Lee, Tak Hyung *(Dept. of Brain and Cognitive Sciences, Seoul National Unive)*; Kim, Minah *(Dept. of Psychiatry, Seoul National University College of M)*; Lee, Tae Young *(Dept. of Neuropsychiatry, Seoul National University Hospita)*; Kim, Sung Nyun *(Dept. of Psychiatry, Seoul National University College of M)*; Kwon, Jun Soo* *(Dept. of Psychiatry, Seoul National University College of M)*

16:16-16:18      FrDT18-06.4
**Osteoarthritis Knees Exhibit Smaller Median Frequencies in their Vibroarthrographic Signals**
Wang, Jia-Jung* *(I-Shou University)*; Zhang, Jia-Fong *(I-Shou University)*; Liu, Shing-Hong *(Chaoyang University of Technology, Taichung, Taiwan, ROC)*; Yen, Cheng-Yo *(E-Da Hospital)*; Hsu, Hsiang-Chen *(I-Shou University)*

**FrDT18-07:** 16:10-17:10      Montgomery Hall
**Time-Frequency and Time-Scale Analysis – Nonstationary Processing** (Poster Session)

16:10-16:12      FrDT18-07.1
**Study on Subject-Specific Parameters in Sleep Spindle Detection Algorithm**
Choi, Jinyoung *(Gwangju Institute of Science and Tech.)*; Han, Sangjun *(Gwangju Institute of Science and Tech.)*; Kwon, Moonyoung *(Gwangju Institute of Science and Tech.)*; Seo, Hyeon *(Gwangju Institute of Science and Tech.)*; Jang, Sehyeon *(Gwangju Institute of Science and Tech.)*; Jun, Sung Chan* *(Gwangju Institute of Science and Tech.)*

16:12-16:14      FrDT18-07.2
**A Comparison of Smartphone Camera-Based Heart Rate Detection Methods**
Zaman, Rifat *(Texas Tech University)*; Cho, Chae Ho *(Texas Tech University)*; Lee, Jiyeon *(KRIBB)*; Seo, Sung Eun *(Korea Research Institute of Bioscience & Biotechnology)*; Kwon, Oh Seok *(Korea Research Institute of Bioscience and Biotechnology)*; Chong, Jo Woon* *(Texas Tech University)*

16:14-16:16      FrDT18-07.3
**Acute Mental Stress Response Level Detection using Short-Term Heart Rate Variability Indices**
taehyun, kim *(Hanyang University)*; You, Sungmin *(Hanyang University)*; Lee, Jong-Shill *(Hanyang University)*; Kim, In-Young* *(Hanyang University)*

16:16-16:18      FrDT18-07.4
**A Novel Motion and Noise Artifact Detection Algorithm for Smartphone PPG Signals**
Phan, Tra *(Texas Tech University)*; Cho, Chae Ho *(Texas Tech University)*; Seo, Sung Eun *(Korea Research Institute of Bioscience & Biotechnology)*; Lee, Jiyeon *(Dongduk Women's University)*; Kwon, Oh Seok *(Korea Research Institute of Bioscience and Biotechnology)*; Kim, Daeik *(Chonnam National University)*; Chong, Jo Woon* *(Texas Tech University)*

**FrDT18-08:** 16:10-17:10      Montgomery Hall
**Time-Frequency and Time-Scale Analysis – Time-Frequency Analysis** (Poster Session)

16:10-16:12      FrDT18-08.1
**Heart Rate Estimation from Compressed Photoplethysmogram**
Park, Chanki* *(Gwangju Institute of Science and Tech.)*; Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

16:12-16:14      FrDT18-08.2
**Monitoring and Evaluation of Patients' Mechanical Impedance during CPR**
Lee, Do Yeon *(kangwon University)*; Park, Soo-jin *(Kangwon National University)*; Kang, Seong Min *(Kangwon National University)*; Choi, Seong Wook* *(Kangwon National University)*

16:14-16:16      FrDT18-08.3
**Effect of Low Sampling Rate on the First Derivative of the PPG Waveform**
Han, Sangjin *(Chonnam National University)*; Shin, Hangsik* *(Chonnam National University)*

16:16-16:18      FrDT18-08.4
**Quantitative Sleep EEG Analysis of Stroke Patients**
Foldager, Jonathan* *(Technical University of Denmark)*; Ponsaing, Laura B. *(Rigshospitalet - Glostrup)*; Iversen, Helle K. *(Apoplexy Unit, Dept. of Neurology, Glostrup Hospital, 2600)*; Sorensen, Helge B D *(Technical University of Denmark)*; Jennum, Poul *(University of Copenhagen, Demnar)*

16:18-16:20      FrDT18-08.5
**Proposal of a Method for Extracting Instantaneous Heart Rate from Pressure Time Series Measured from a Person on a Bed**
Ogishi, Yudai* *(Meijo Univ.)*; Mukai, Toshiharu *(Meijo Univ.)*

16:20-16:22      FrDT18-08.6
**State-Space Model based Multitaper Spectral Estimation**
Kim, Seong-Eun* *(Massachusetts Institute of Technology)*; Behr, Michael *(Google)*; Ba, Demba *(MIT)*; Brown, Emery N *(MGH-Harvard Medical School-MIT)*

16:22-16:24      FrDT18-08.7
**Cumulative Spectral Power for Studying on Seasonal Changes in Radial Pulse**
Bae, Jang-Han* *(Korea Institute of Oriental Medicine, KAIST)*; Kim, Jaeuk U *(Korean Institute of Oriental Medicine)*

16:24-16:26      FrDT18-08.8
**Tracking the Beat in the Brain via Source Power Co-Modulation in the Beta Band**
Brandl, Stephanie* *(Berlin Institute of Tech.)*; Dähne, Sven *(Technical University of Berlin)*; Blankertz, Benjamin *(Technische Universität Berlin)*; Müller, Klaus-Robert *(Berlin Institute of Tech.)*; Grube, Manon *(Berlin Institute of Tech.)*

16:26-16:28      FrDT18-08.9
**Evaluation of EEG Characteristics for Personal Authentication**
Kang, Jae-Hwan *(Ulsan National Institute of Science and Technology)*; Jo, Young Chang *(Korea Electronics Technology Institute)*; Kim, Sung-Phil* *(Ulsan National Institute of Science and Technology)*

**FrDT18-09:** 16:10-17:10      Montgomery Hall
**Time-Frequency and Time-Scale Analysis – Wavelets** (Poster Session)

16:10-16:12      FrDT18-09.1
**Analysis of the Emotion of Fear using Galvanic Skin Response Signal**
Lim, Hyunjun *(Yonsei Univ.)*; Oh, Seung Young *(Yonsei Univ.)*; Kim, Byeongnam *(Yonsei Univ.)*; Lee, JeeEun *(Yonsei Univ.)*; Yoo, Sun K.* *(Yonsei Univ. Health System)*

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**SaAT1:** 08:00-09:30      Roentgen Hall
**Data Mining and Processing in Biosignals I** (Oral Session)

08:00-08:15      SaAT1.1
**A Flexible Method for the Automated Offline-Detection of Artifacts in Multi-Channel Electroencephalogram Recordings**
Waser, Markus* *(Technical Univ. of Denmark)*; Garn, Heinrich *(AIT Austrian Institute of Technology GmbH)*; Benke, Thomas *(Innsbruck Medical Univ.)*; Dal-Bianco, Peter *(Medical Univ. of Vienna)*; Ransmayr, Gerhard *(AKh Allgemeines Krankenhaus der Stadt Linz GmbH)*; Schmidt, Reinhold *(Graz Medical Univ.)*; Jennum, Poul *(Univ. of Copenhagen, Demnar)*; Sorensen, Helge B D *(Technical Univ. of Denmark)*

08:15-08:30      SaAT1.2
**Elucidating Age-Specific Patterns from Background Electroencephalogram Pediatric Data Sets via PARAFAC**
Kinney-Lang, Eli* *(University of Edinburgh)*; Spyrou, Loukianos *(University of Edinburgh)*; Ebied, Ahmed *(University of Edinburgh)*; Chin, Richard *(The University of Edinburgh)*; Escudero, Javier *(University of Edinburgh)*

08:30-08:45      SaAT1.3
**Speech Features for Telemonitoring of Parkinson's Disease Symptoms**
Ramezani, Hamideh* *(Koc Univ.)*; Khaki, Hossein *(Koc Univ.)*; Erzin, Engin *(Koc Univ.)*; Akan, Ozgur B. *(Koc Univ.)*

08:45-09:00      SaAT1.4
**"You Sound Ill, Take the Day Off": Automatic Recognition of Speech Affected by Upper Respiratory Tract Infection**
Cummins, Nicholas* *(University of Passau)*; Schmitt, Maximilian *(University of Passau)*; Amiriparian, Shahin *(University of Passau,)*; Krajewski, Jarek *(University of Wuppertal)*; Schuller, Bjoern *(University of Passau)*

09:00-09:15      SaAT1.5
**Linear-Sigmoidal Modelling of Accelerometer Features and Tinetti Score for Automatic Fall Risk Assessment**
Rivolta, Massimo Walter* *(Università degli studi di Milano)*; Sassi, Roberto *(Università degli Studi di Milano)*

09:15-09:30      SaAT1.6
**Convolutional Neural Network Architecture and Input Volume Matrix Design for ERP Classifications in a Tactile P300 – Based Brain – Computer Interface**
Kodama, Takumi* *(University of Tsukuba)*; Makino, Shoji *(University of Tsukuba)*

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**SaAT2:** 08:00-09:30      Cho Room
**Frontiers in Wavefront Shaping Techniques** (Minisymposium)
**Chair:** Lai, Puxiang *(Hong Kong Polytechnic University)*

08:00-08:15      SaAT2.1
**Fast Digital Optical Phase Conjugation**
Wang, Daifa* *(Tsinghua University)*

08:15-08:30      SaAT2.2
**Progress and Challenges of Time Reversal based Wavefront Shaping**
Cheng, Ma* *(Tsinghua University, Bejing, China)*

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**SaAT3:** 08:00-09:30      Park Room
**Infrared and Thermal Imaging** (Oral Session)
**Chair:** Czaplik, Michael *(University Hospital RWTH Aachen)*
**Co-Chair:** Ruminski, Jacek *(Gdansk University of Technology)*

08:00-08:15      SaAT3.1
**Estimation of Respiratory Rate from Thermal Videos of Preterm Infants**
Barbosa Pereira, Carina* *(RWTH Aachen Univ.)*; Heimann, Konrad *(Univ. Children' s Hospital, Dept. of Neonatology, RWTH)*; Venema, Boudewijn *(Philips Chair for Medical Information Tech., RWTH Aachen)*; Blazek, V. *(Philips Chair for Medical Info. Tech., RWTH Aachen)*; Czaplik, M. *(Univ. Hospital RWTH Aachen)*; Leonhardt, S. *(RWTH Aachen Univ.)*

08:15-08:30      SaAT3.2
**Automated Segmentation of Regions of Interest from Thermal Images of Hands**
Gauci, Jean *(University of Malta)*; Falzon, Owen* *(University of Malta)*; Camilleri, Kenneth Patrick *(University of Malta)*; Formosa, Cynthia *(University of Malta)*; Gatt, Alfred *(University of Malta)*; Mizzi, Stephen *(University of Malta)*; Mizzi, Anabelle *(University of Malta)*; Cassar, Kevin *(Mater Dei Hospital)*; Sturgeon, Cassandra *(University of Malta)*; Chockalingam, Nachiappan *(Staffordshire University)*

08:30-08:45      SaAT3.3
**Automatic Analysis of the Aggressive Behavior of Laboratory Animals using Thermal Video Processing**
Mazur-Milecka, Magdalena *(Gdańsk University of Technology)*; Ruminski, Jacek* *(Gdansk University of Technology)*

08:45-09:00      SaAT3.4
**Development of a "Thermal-Associated Pain Index" Score using Infrared-Thermography for Objective Pain Assessment**
Czaplik, Michael* *(Univ. Hospital RWTH Aachen)*; Hochhausen, Nadine *(RWTH Aachen Univ., Section Medical Technology at the Depart)*; Dohmeier, Henriette *(RWTH Aachen Univ., Section Medical Technology at the Depart)*; Barbosa Pereira, Carina *(RWTH Aachen Univ.)*; Rossaint, Rolf *(RWTH Aachen Univ., Dept. of Anesthesiology)*

09:00-09:15      SaAT3.5
**Comparison of Motion-Based Analysis to Thermal-Based Analysis of Thermal Video in the Extraction of Respiration Patterns**
Bennett, Stephanie Louise* *(Carleton University)*; Goubran, Rafik A. *(Carleton University)*; Knoefel, Frank-Dietrich *(Bruyere Continuing Care, University of Ottawa, Carleton Universi)*

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**SaAT5:** 08:00-09:30      Lee Room
**Integrated Circuits and Systems** (Oral Session)
**Chair:** Pino, Esteban J *(Universidad de Concepcion)*

08:00-08:15      SaAT5.1
**A Sub-nj CMOS ECG Classifier for Wireless Smart Sensor**
Chollet, Paul* *(IMT Atlantique Bretagne-Pays de la Loire)*; Pallas, Rémi *(Telecom bretagne)*; Lahuec, Cyril *(TELECOM Bretagne, France)*; Arzel, Matthieu *(TELECOM Bretagne, France)*; Seguin, Fabrice *(Institut Mines Telecom Atlantique)*

08:15-08:30      SaAT5.2
**A Low Power, Low Noise Programmable Analog Front End (PAFE) for Biopotential Measurements**
Adimulam, Mahesh Kumar* *(Birla Institute of Tech. and Science – Pilani, Hyderabad Ca)*; Adimulam, Divya *(EE Dept., Birla Institute of Tech. and Science – Pilan)*; K, Tejaswi *(Birla Institute of Tech. and Science – Pilani, Hyderabad Ca)*; M B, Srinivas *(EE Dept., Birla Institute of Tech. and Science – Pilan)*

08:30-08:45      SaAT5.3
**Improving Efficiency of DC/DC Booster Converters used in Electrical Stimulators**
Aqueveque, Pablo* *(Univ. of Concepcion)*; Saavedra, Francisco *(Univ. of Concepcion)*; Pino, Esteban J *(Univ. de Concepcion)*

08:45-09:00      SaAT5.4
**Wireless Wearable User Interface Cursor-Controller (UIC-C)**
Marjanovic, Nicholas* *(University of Illinois at Chicago)*; Kerr, Kevin *(University of Illinois-Chicago)*; Aranda, Ricardo *(University of Illinois at Chicago)*; Hickey, Richard *(University of Illinois at Chicago)*; Esmailbeigi, Hananeh *(University of Illinois at Chicago (UIC))*

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**SaAT6:** 08:00-09:30      Zworykin Room
**Biologically Inspired Regenerative Systems** (Invited Session)
**Chair:** Jabbari, Esmaiel *(University of South Carolina)*

08:00-08:15      SaAT6.1
**Droplet-Based in Vitro Tumor Model of Gastric Cancer Cells**
Kim, Pilnam* *(Korea Advanced Institute of Science and Tech.)*

**08:15-08:30**        SaAT6.2

**Bioprinting via Visible Light Stereolithography**

Kim, Keekyoung* *(University of British Columbia Okanagan Campus)*; Wang, Zongjie *(University of British Columbia)*

**08:30-08:45**        SaAT6.3

**Macrophage Polarization on Cell Sheets Seeded with Devitalized Mesenchymal and Endothelial Progenitor Cells**

Jabbari, Esmaiel* *(University of South Carolina)*

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**SaAT7:** 08:00-09:30        Herrick Room
**Neurorehabilitation I** (Oral Session)

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**08:00-08:15**        SaAT7.1

**Feasibility of using the RAPAEL Smart Glove in Upper Limb Physical Therapy for Patients after Stroke: A Randomized Controlled Trial**

Jung, Hee-Tae* *(Daegu Univ.)*; Kim, Hwan *(Daegu Univ.)*; Jeong Jugyeong, Jeong Jugyeong *(Heeyeon Hospital)*; Jeon, Bomin *(희연병원 Occupational Therapy)*; Ryu, Taekyeong *(Heeyeon Hospital)*; Kim, Yangsoo *(Heeyeon Hospital)*

**08:15-08:30**        SaAT7.2

**Assessment of Elbow Spasticity with Surface Electromyography and Mechanomyography based on Support Vector Machine**

Wang, Hui *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Wang, Lei *(Shenzhen Institutes of Advanced Technology Chinese Academy of Sc)*; Xiang, Yun *(The Sixth People's Hospital of Shenzhen City, Rehabilitation Ins)*; Zhao, Ning *(Rehabilitation Unit, Nanshan District People's Hos)*; Li, Xiangxin *(Shenzhen Institutes of Advanced Technology, Chinese Academy of Sc)*; Chen, Shixiong *(Shenzhen Institutes of Advanced Technology)*; Lin, Chuang *(Univ. Medical Center Goettingen, Georg-August Univ.)*; Li, Guanglin* *(Shenzhen Institutes of Advanced Technology)*

**08:30-08:45**        SaAT7.3

**Accurate Estimation of Joint Motion Trajectories for Rehabilitation using Kinect**

Sinha, Sanjana* *(Innovation Labs, Tata Consultancy Services Ltd.)*; Bhowmick, Brojeshwar *(Innovation Labs, Tata Consultancy Services Ltd.)*; Sinha, Aniruddha *(Tata Consultancy Services Ltd.)*; Das, Abhijit *(Institute of NeuroSciences Kolkata)*

**08:45-09:00**        SaAT7.4

**Electrical Neurostimulation of a Mammalian Nerve Fibers: A Probabilistic versus Mechanistic Approach**

Sadashivaiah, Vijay* *(Johns Hopkins University)*; Sacré, Pierre *(Johns Hopkins University)*; Guan, Yun *(Johns Hopkins University School of Medicine)*; Anderson, William S. *(Johns Hopkins School of Medicine, Dept. of Neurosurgery)*; Sarma, Sridevi V. *(Johns Hopkins University)*

**09:00-09:15**        SaAT7.5

**Quantification Method of Motor Function Recovery of Fingers by using the Device for Home Rehabilitation**

Furudate, Yuta* *(Future University Hakodate)*; Yamamoto, Kazuki *(Future University Hakodate)*; Ishida, Yuji *(Hokkaido Bunkyo University)*; Chiba, Kaori *(Medical Association Hospital Hakodate)*; Mikami, Sadayoshi *(Future University Hakodate)*

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**SaAT9:** 08:00-09:30        Plonsey Room
**Destabilizing Locomotor Paradigms: Understanding Motor Adaptations Post Stroke** (Minisymposium)
**Chair:** Dhaher, Yasin *(Northwestern University)*
**Co-Chair:** Gordon, Keith *(Feinberg School of Medicine, Northwestern University)*

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**08:00-08:15**        SaAT9.1

**Movement Amplification Encourages Active Control of Gait Stability**

Gordon, Keith* *(Feinberg School of Medicine, Northwestern University)*; Wu, Mengnan/Mary *(Northwestern University)*; Brown, Geoffrey *(Northwestern University)*; Woodward, Jane *(Rehabilitation Institute of Chicago)*

**08:15-08:30**        SaAT9.2

**Using Treadmill Cross-Tilt Construct for Motor Adaption Post-Stroke**

Reissman, Megan *(University of Dayton)*; Gordon, Keith *(Feinberg School of Medicine, Northwestern University)*; Dhaher, Yasin* *(Northwestern University)*

**08:30-08:45**        SaAT9.3

**Fall Risk Reduction in Chronic Stroke Survivors: Slip Perturbation Training to Improve Reactive Balance Control**

Bhatt, Tanvi* *(University of Illinois at Chicago)*; Patel, Prakruti *(University of Illinois at Chicago)*

**08:45-09:00**        SaAT9.4

**Using Robotics to Challenge Walking Post-Stroke: A New Assessment and Intervention Paradigm**

Brown, David* *(UAB)*

**09:00-09:15**        SaAT9.5

**Post-Stroke Adaptations to Loss of Balance during Gait**

Sharafi, Bahar* *(The Rehabilitation Institute of Chicago)*; Dhaher, Yasin *(Northwestern University)*

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**SaAT11:** 08:00-09:30        Greatbatch Room
**Computational Models of Cardiac Electrophysiology and Mechanics** (Invited Session)
**Chair:** Shim, Eun Bo *(Kangwon National University)*
**Co-Chair:** Leem, Chae Hun *(Univ. of Ulsan College of Medicine)*

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**08:00-08:15**        SaAT11.1

**In Silico Cardiac Resynchronization Therapy by the Multi-Scale Heart Simulator 'UT-Heart**

Sugiura, Seiryo* *(University of Tokyo)*; Okada, Jun-ichi *(University of Tokyo)*; Washio, Takumi *(University of Tokyo)*; Hisada, Toshiaki *(University of Tokyo)*

**08:15-08:30**        SaAT11.2

**Computational Analysis of the Effect of KCNQ1 G229D Mutation on Cardiac Electromechanical Behaviors using Image-Based FE Heart Model**

Lim, Ki Moo* *(Kumoh National Institute of Technology)*; Yuniarti, Ana Rahma *(Kumoh National Institute of Technology)*

**08:30-08:45**        SaAT11.3

**Diagnostic Performance and Utility of Non-Invasive Instantaneous Flow Reserve**

Lee, Kyung Eun *(Kangwon National University)*; Shim, Eun Bo* *(Kangwon National University)*

**08:45-09:00**        SaAT11.4

**Novel Indices for the Risk Prediction of Cardiovascular Disease**

Leem, Chae Hun* *(University of Ulsan College of Medicine)*

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**SaAT13:** 08:00-09:30        Dunn Room
**Bioinformatics – Bioinformatics Databases** (Oral Session)
**Chair:** Fotiadis, Dimitrios I. *(University of Ioannina)*

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**08:00-08:15**        SaAT13.1

**Identification of Differentially Expressed Genes through a Meta-Analysis Approach for Oral Cancer Classification**

Kourou, Konstantina *(Unit of Biological Applications and Technology, University of Io)*; Papaloukas, Costas *(University of Ioannina)*; Fotiadis, Dimitrios I.* *(University of Ioannina)*

**08:15-08:30**        SaAT13.2

**Alignment-Free Sequence Comparison using Joint Frequency and Position Information of K-Words**

Han, Gyu-Bum *(Korea Advanced Institute of Science and Technology (KAIST))*; Chung, Byung Chang *(Korea Advanced Institute of Science and Technology (KAIST))*; Cho, Dong-Ho* *(Korea Advanced Institute of Science and Technology (KAIST))*

**08:30-08:45**        SaAT13.3

**Privacy-Preserving Chi-Squared Testing for Genome SNP Databases**

Sei, Yuichi* *(University of Electro-Communications)*; Ohsuga, Akihiko *(University of Electro-Communications)*

**08:45-09:00**                                                    SaAT13.4
**MotifMark: Finding Regulatory Motifs in DNA Sequences**
Hassanzadeh, Hamid* *(Georgia Institute of Technology)*;
Wang, May D. *(Georgia Tech and Emory University)*

**09:00-09:15**                                                    SaAT13.5
**Classification of Various Genomic Sequences based on Distribution of Repeated K-Word**
Song, Yong-Joon *(Korea Advanced Institute of Science and Technology (KAIST))*; Cho, Dong-Ho* *(Korea Advanced Institute of Science and Technology (KAIST))*

**09:15-09:30**                                                    SaAT13.6
**Predicting Rapid Progression of Parkinson's Disease at Baseline Patients Evaluation**
Tsiouris, Kostas *(Biomedical Engineering Lab, School of Electrical and Comp)*; Rigas, Georgios *(Univ. of Ioannina)*; Gatsios, Dimitris *(Univ. of Ioannina)*; Antonini, Angelo *(IRCCS Fondazione Ospedale San Camillo,Division of Parkinson's Di)*; Konitsiotis, Spiros *(Medical School, Univ. of Ioannina)*; Koutsouris, Dimitrios *(Biomedical Engineering Lab, School of Electrical and Comp)*; Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

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**SaAT14: 08:00-09:30**                            Schaldach Room
**Imaging-Based Biomarkers** (Oral Session)
**Chair:** Park, Hyunjin *(Sungkyunkwan University)*

**08:00-08:15**                                                    SaAT14.1
**Colorimetric Recognition for Urinalysis Dipsticks based on Quadratic Discriminant Analysis**
Dong, Kai *(Nanjing University of Science & Technology)*; Dong, Tao* *(University College of Southeast Norway - HSN, TekMar)*

**08:15-08:30**                                                    SaAT14.2
**Automatic Detection of Periodontitis using Intra-Oral Images**
Tabatabaei Balaei, Asghar* *(Univ. of Sydney)*; de Chazal, Philip *(Univ. of Sydney)*; Eberhard, Joerg *(Univ. of Sydney)*; Ruiz, Kate *(Univ. of Sydney)*; Spahr, Axel *(Univ. of Sydney)*; Domnisch, Henrik *(Charite Univ., Berlin)*

**08:30-08:45**                                                    SaAT14.3
**Content-Based Retrieval for Lung Nodule Diagnosis using Learned Distance Metric**
Wei, Guohui *(Northeastern University)*; Ma, He* *(Northeastern University)*; Qian, Wei *(Northeastern University)*; Jiang, Hongyang *(Sino-Dutch Biomedical and Information Engineering School, Northe)*; Zhao, Xinzhuo *(Northeastern University)*

**08:45-09:00**                                                    SaAT14.4
**11C-PIB PET Image Analysis for Alzheimer's Diagnosis using Weighted Voting Ensembles**
Wu, Wenjun *(Georgia Institute of Technology)*; Venugopalan, Janani *(Georgia Institute of Technology)*; Wang, May D.* *(Georgia Tech and Emory University)*

**09:00-09:15**                                                    SaAT14.5
**Touch-Free Reaching Task for Parkinson's Disease Patients: A Motion Sensing Approach**
Salimpour, Yousef* *(Johns Hopkins School of Medicine)*; Chien, Jui-Hong *(Johns Hopkins Univ.)*; Lee, Sangwon *(Johns Hopkins School of Medicine)*; Liu, Chang-Chia *(Johns Hopkins School of Medicine)*; Guadix, Sergio *(Johns Hopkins Univ., Univ. of Pennsylvania)*; Mills, Kelly *(Johns Hopkins Univ.)*; Anderson, William S. *(Johns Hopkins School of Medicine, Dept. of Neurosurgery)*

**09:15-09:30**                                                    SaAT14.6
**Imaging Genetics Approach to Predict Progression of Parkinson's Diseases**
Kim, Mansu *(Sungkyunkwan Univ.)*; Son, Seong-Jin *(Sungkyunkwan Univ.)*; Park, Hyunjin* *(Sungkyunkwan Univ.)*

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**SaAT16: 08:00-09:30**                              Rushmer Room
**Haptics** (Oral Session)

**08:00-08:15**                                                    SaAT16.1
**Development and Control of a Magnetorheological Haptic Device for Robot Assisted Surgery**
Shokrollahi, Elnaz* *(Univ. of Toronto)*; Goldenberg, Andrew A. *(Univ. of Toronto)*; Drake, James *(Univ. of Toronto, CIGITI, Hospital for Sick Children)*; Eastwood, Kyle *(Univ. of Toronto)*; Kang, Matthew *(Univ. of Toronto)*

**08:15-08:30**                                                    SaAT16.2
**Haptic fMRI: Reliability and Performance of Electromagnetic Haptic Interfaces for Motion and Force Neuroimaging Experiments**
Menon, Samir* *(Stanford University)*; Zhu, Jack *(Stanford University)*; Goyal, Deeksha *(Stanford University)*; Khatib, Oussama *(Stanford University)*

**08:30-08:45**                                                    SaAT16.3
**Grasper Integrated Tri-Axial Force Sensor System for Robotic Minimally Invasive Surgery**
Dai, Yuan* *(Univ. of California, Los Angeles)*; Abiri, Ahmad *(Univ. of California, Los Angeles)*; Liu, Siyuan *(Univ. of California Los Angeles)*; Paydar, Omeed *(Univ. of California, Los Angeles)*; Sohn, Hyunmin *(Univ. of California, Los Angeles)*; Dutson, Erik P. *(UCLA)*; Grundfest, Warren S. *(UCLA)*; Candler, Robert *(Univ. of California, Los Angeles)*

**08:45-09:00**                                                    SaAT16.4
**Three-Axis Force Sensor with Fiber Bragg Grating**
Choi, Hyun Do *(SAIT (Samsung Advanced Institute of Tech.))*; Lim, Yo-An *(Samsung Advanced Institute of Tech., Samsung Electronics)*; Kim, Jun Hyung* *(Samsung Electronics Co.)*

**09:00-09:15**                                                    SaAT16.5
**Positioning the Endoscope in Laparoscopic Surgery by Foot: Influential Factors on Surgeons' Performance in Virtual Trainer**
Abdi, Elahe* *(EPFL)*; Bouri, Mohamed *(EPFL)*; Burdet, Etienne *(Imperial Collge of Science, Technology and Medicine)*; Himidan, Sharifa *(Hospital of SickKids)*; Bleuler, Hannes *(EPFL)*

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**SaAT17: 08:00-09:30**                              Einthoven Hall
**Connectivity Measurements I** (Oral Session)
**Chair:** Semenova, Oksana *(University College Cork)*
**Co-Chair:** Anzolin, Alessandra *(Univ. of Rome Sapienza, Neuroelectrical Imaging and BCI Lab IRCCS Fondazione Santa Lucia)*

**08:00-08:15**                                                    SaAT17.1
**Estimation of Coherence using the Median is Robust against EEG Artefacts**
Dukic, Stefan *(Trinity College Dublin)*; Iyer, Parameswaran M. *(Trinity College Dublin)*; Mohr, Kieran *(Trinity College Dublin)*; Hardiman, Orla *(Trinity College Dublin)*; Lalor, Edmund *(Trinity College Dublin)*; Nasseroleslami, B.* *(Trinity College Dublin)*

**08:15-08:30**                                                    SaAT17.2
**Brain Connectivity Networks at the Basis of Human Attention Components: An EEG Study**
Anzolin, Alessandra* *(Univ. of Rome "Sapienza", Neuroelectrical Imaging and BCI Lab IR)*; Mattia, Donatella *(Fondazione Santa Lucia IRCCS)*; Toppi, Jlenia *(University of Rome "Sapienza")*; Pichiorri, Floriana *(Fondazione Santa Lucia, IRCCS, Rome, Italy)*; Riccio, Angela *(Neuroelectrical Imaging and BCI Lab IRCCS Fondazione SantaLucia)*; Astolfi, Laura *(University of Rome Sapienza)*

**08:30-08:45**                                                    SaAT17.3
**Graph Theoretical Analysis of EEG Functional Network during Multi-Workload Flight Simulation Experiment in Virtual Reality Environment**
Zhang, Shengqian *(National Univ. of Singapore)*; Zhang, Yuan *(National Univ. of Singapore)*; Sun, Yu *(National Univ. of Singapore)*; Thakor, Nitish *(Johns Hopkins Univ.)*; Bezerianos, Anastasios* *(National Univ. of Singapore)*

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**08:45-09:00**                                    SaAT17.4

**How the Workload Impacts on Cognitive Cooperation: A Pilot Study**

Sciaraffa, Nicolina *(Dept. of Computer, Control and Management Engineering, Univ)*; Borghini, Gianluca *(University of Rome Sapienza)*; Arico, Pietro *(Fondazione Santa Lucia)*; Di Flumeri, Gianluca* *(University of Rome Sapienza)*; Toppi, Jlenia *(University of Rome "Sapienza")*; Colosimo, Alfredo *(University of Rome "Sapienza")*; Bezerianos, Anastasios *(National University of Singapore)*; Thakor, Nitish *(Johns Hopkins University)*; Babiloni, Fabio *(University of Rome)*

**09:00-09:15**                                    SaAT17.5

**Community Detection: Comparison among Clustering Algorithms and Application to EEG-Based Brain Networks**

Puxeddu, Maria Grazia *(Sapienza, University of Rome)*; Petti, Manuela* *(Univ. of Rome "Sapienza", Neuroelectrical Imaging and BCI Lab IR)*; Pichiorri, Floriana *(Fondazione Santa Lucia, IRCCS, Rome, Italy)*; Cincotti, Febo *(Sapienza University of Rome)*; Mattia, Donatella *(Fondazione Santa Lucia IRCCS)*; Astolfi, Laura *(University of Rome Sapienza)*

**09:15-09:30**                                    SaAT17.6

**Modelling Interactions between Blood Pressure and Brain Activity in Preterm Neonates**

Semenova, Oksana* *(Univ. College Cork)*; Lightbody, Gordon *(Univ. College Cork)*; O'Toole, John M. *(Univ. College Cork)*; Boylan, Geraldine *(Univ. College Cork)*; Dempsey, Eugene *(Irish Centre for Fetal and Neonatal Translational Research (INFA)*; Temko, Andriy *(Univ. College Cork)*

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**SaAT18:** 08:00-09:30                       Montgomery Hall

**Time-Frequency and Time-Scale Analysis – Cardiovascular Signals** (Oral Session)

**08:00-08:15**                                    SaAT18.1

**An Analysis Method for Wearable Electrocardiogram Measurement based on Non-Orthogonal Complex Wavelet Expansion**

Shimauchi, Suehiro* *(NTT Corporation)*; Eguchi, Kana *(NTT Corporation)*; Takeda, Toki *(NTT Service Evolution Laboratories)*; Aoki, Ryosuke *(NTT Corporation)*

**08:15-08:30**                                    SaAT18.2

**Smooth Bandpass Empirical Mode Decomposition with Rolling Ball Sifting for Extracting Carotid Bruits and Heart Sounds**

Huang, Adam* *(National Central University)*; Liu, Min-Yin *(National Central University)*; Lee, Chung-Wei *(National Taiwan University Hospital)*; Liu, Hon-Man *(National Taiwan University)*

**08:30-08:45**                                    SaAT18.3

**Automatic Atrial Fibrillation Detection: A Novel Approach using Discrete Wavelet Transform and Heart Rate Variability**

Bruun, Iben Hervold* *(Technical University of Denmark)*; Hissabu, Semira M. S. *(Technical University of Denmark)*; Poulsen, Erik S. *(Cortrium ApS)*; Puthusserypady, Sadasivan *(Technical University of Denmark)*

**08:45-09:00**                                    SaAT18.4

**Comparison of Frequency-Based Techniques for Assessment of Baroreceptor Sensitivity and Heart Rate Variability**

Ramachandran, Harish *(Macquarie University)*; Butlin, Mark *(Macquarie University)*; Quinn, Barry *(Macquarie University)*; Avolio, Alberto P* *(Macquarie University)*; Town, Graham *(Macquarie University)*

**09:00-09:15**                                    SaAT18.5

**Discrimination of Multiple Stress Levels in Virtual Reality Environments using Heart Rate Variability**

Ham, Jinsil* *(Gwangju Institute of Science and Tech. (GIST))*; Cho, Dongrae *(Gwangju Institute of Science and Tech.)*; Oh, Jooyoung *(Gwangju Institute of Science and Tech.)*; Lee, Boreom *(Gwangju Institute of Science and Tech. (GIST))*

**09:15-09:30**                                    SaAT18.6

**Contribution of Body Movements on the Heart Rate Variability during High Intensity Running**

Alikhani, Iman* *(University of Oulu)*; Noponen, Kai *(University of Oulu)*; Seppänen, Tapio *(University of Oulu)*

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**SaBT1:** 10:50-12:20                           Roentgen Hall

**Physiological Systems Modeling I** (Oral Session)
**Chair:** Fanelli, Andrea *(Massachusetts Institute of Technology)*

**10:50-11:05**                                    SaBT1.1

**Detection of Sympathoadrenal Discharge by Parameterisation of Skin Conductance and ECG Measurement**

Tronstad, Christian* *(Oslo University Hospital)*; Elvebakk, Ole *(Oslo University Hospital)*; Kalvoy, Haavard *(Rikshospitalet)*; Bjørgaas, Marit Ragnhild *(St.Olavs Hospital)*; Martinsen, Ørjan G *(University of Oslo)*

**11:05-11:20**                                    SaBT1.2

**Regression-Based Noninvasive Estimation of Intracranial Pressure**

Fanelli, Andrea *(Massachusetts Institute of Tech.)*; Vonberg, Frederick William *(Boston Children's Hospital, Harvard University)*; Jaishankar, Rohan *(Massachusetts Institute of Tech.)*; Imaduddin, Syed *(Massachusetts Institute of Tech.)*; Tasker, Robert *(Boston Children's Hospital)*; Heldt, Thomas* *(Massachusetts Institute of Tech.)*

**11:20-11:35**                                    SaBT1.3

**Correction of Tissue Oxygen Saturations using Arterial Oxygen Levels for Cerebrovascular Autoregulation Analysis**

Antunes, Andre* *(Medtronic)*; Addison, Paul *(Medtronic)*; Montgomery, Dean *(Univ. of Edinburgh)*; Borg, Ulf *(Medtronic)*

**11:35-11:50**                                    SaBT1.4

**Unsupervised Gait Detection using Biomechanical Restrictions**

Hotta, Shinji* *(Fujitsu Labs Ltd.)*; Inomata, Akihiro *(Fujitsu Japan)*; Sasamoto, Yuki *(Fujitsu Labs Ltd.)*; Washizawa, Shiho *(Fujitsu Labs Ltd.)*; Caulfield, Brian *(UCD)*

**11:50-12:05**                                    SaBT1.5

**Model Selection for the Pulse Decomposition Analysis of Fingertip Photoplethysmograms**

Tigges, Timo* *(Technical University Berlin)*; Pielmus, Alexandru Gabriel *(Technical University Berlin)*; Klum, Michael *(Technical University Berlin)*; Feldheiser, Aarne *(Charité Campus Virchow-Klinikum)*; Hunsicker, Oliver *(Charité Campus Virchow-Klinikum)*; Orglmeister, Reinhold *(Technische Universität Berlin)*

**12:05-12:20**                                    SaBT1.6

**On a Unified Point Process Approach for the Characterization of Bioelectric Discrete Phenomena**

Yana, Kazuo* *(Hosei Univ.)*; Mino, Hiroyuki *(Kanto Gakuin Univ.)*

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**SaBT2:** 10:50-12:20                                Cho Room

**Optical Imaging I** (Oral Session)
**Chair:** Chung, Euiheon *(Gwangju Institute of Science and Tech.)*

**10:50-11:05**                                    SaBT2.1

**Hemodynamic Response to Optogenetic Stimulation Varied under Different Stimulus Parameters**

Bo, Bin *(Shanghai Jiao Tong University)*; Li, Wanlu *(Shanghai Jiao Tong University)*; Wang, Yongting *(Shanghai Jiao Tong University)*; Li, Yao* *(Shanghai Jiao Tong University)*; Tong, Shanbao *(Shanghai Jiao Tong University)*

**11:05-11:20**                                    SaBT2.2

**Phase-Domain Photoacoustics Eliminating Acoustic Detection Variations**

Duan, Tingyang *(Shanghai Tech University)*; Zhang, Ruochong *(Nanyang Technological University)*; Feng, Xiaohua *(Nanyang Technological University)*; Liu, Siyu *(Nanyang Technological University)*; Ding, Ran *(Nanyang Technological University)*; Zheng, Yuanjin *(Nanyang Technological University)*; Gao, Fei* *(Shanghai Tech University)*

**11:20-11:35**                                    SaBT2.3

**An Iterative Weighted Method based on YALL1 for Cone-Beam X-Ray Luminescence Optical Tomography Imaging: A Phantom Experimental Study**

Zhao, Lili *(Shanghai University)*; Jiang, Jiehui *(Shanghai University)*; Shu, Yuexia *(Shanghai University)*; Yan, Zhuangzhi *(Shanghai University)*; Liu, Xin* *(Shanghai University)*

**11:35-11:50**                                          SaBT2.4

**A Fast Forward Solver of Fluorescence Diffuse Optical Tomography based on the Lattice Boltzmann Method**
Zhang, Wenqing *(Shanghai University)*; Yan, Zhuangzhi* *(Shanghai University)*; Jiang, Jiehui *(Shanghai University)*

**11:50-12:05**                                          SaBT2.5

**A Dual-Modality Optical Coherence Tomography and Selective Plane Illumination Microscopy System for Mouse Embryonic Imaging**
Larin, Kirill* *(University of Houston)*

**12:05-12:20**                                          SaBT2.6

**Label-Free Hyperspectral Imaging and Quantification Methods for Surgical Margin Assessment of Tissue Specimens of Cancer Patients**
Fei, Baowei* *(Emory Univ. and Georgia Institute of Technology)*

**10:50-11:05**                                          SaBT3.1

**Multiplexed Immunohistochemistry Image Analysis using Sparse Coding**
Chang, Young Hwan* *(Oregon Health and Science University)*; Tsujikawa, Takahiro *(Oregon Health and Science University)*; Margolin, Adam *(Oregon Health and Science University)*; Coussens, Lisa M. *(Oregon Health and Science University)*; Gray, Joe *(Oregon Health & Science University)*

**11:05-11:20**                                          SaBT3.2

**Histopathological Image Classification with Bilinear Convolutional Neural Networks**
Chaofeng, Wang *(Shanghai Univ.)*; Shi, Jun* *(Shanghai Univ.)*; Zhang, Qi *(Shanghai Univ.)*; Ying, Shihui *(Shanghai Univ.)*

**11:20-11:35**                                          SaBT3.3

**Angiosome based Time Series Analysis of Deep Tissue Perfusion using Diffuse Speckle Contrast Analysis**
Yeo, Chaebeom *(DGIST)*; Lee, K. *(DGIST)*; Song, C.* *(DGIST)*

**11:35-11:50**                                          SaBT3.4

**Human Induced Pluripotent Stem Cell Region Recognition in Microscopy Images using Convolutional Neural Networks**
Chang, Yuan-Hsiang *(Chung Yuan Christian Univ.)*; Abe, Kuniya *(Mammalian Genome Dynamics, RIKEN BioResource Center)*; Yokota, H. *(RIKEN Center for Advanced Photonics)*; Lin, C.-Y. *(Chung Yuan Christian Univ.)*; Sudo, K. *(BioResouce Center, RIKEN)*; Nakamura, Y. *(RIKEN BioResource Center)*; Tsai, M.-D.* *(Chung-Yuan Christian Univ.)*

**11:50-12:05**                                          SaBT3.5

**Analysis of Mitochondrial Shape Dynamics using Large Deformation Diffeomorphic Metric Curve Matching**
Yang, Huilin *(Carnegie Mellon University)*; Wang, Jing *(Carnegie Mellon University)*; Tang, Haiyun *(Carnegie Mellon University)*; Ba, Qinle *(Carnegie Mellon University)*; Yang, Ge *(Carnegie Mellon University)*; Tang, Xiaoying* *(Sun Yat-sen University-Carnegie Mellon University (SYSU-CMU) Joi)*

**12:05-12:20**                                          SaBT3.6

**Tissue Classification in a Canine Model of Duchenne Muscular Dystrophy using Quantitative MRI Parameters**
Eresen, Aydin *(Texas A&M University)*; Sharla, Birch *(Texas A&M University)*; McConnell, Stephen *(Texas A&M University)*; Griffin, Jay *(Texas A&M University)*; Kornegay, Joe *(Texas A&M University)*; Ji, Jim Xiuquan* *(Texas A&M University)*

**10:50-11:05**                                          SaBT4.1

**Effects of Respiration Depth on Human Body Radar Cross Section using 2.4GHz Continuous Wave Radar**
Lee, Alexander* *(Univ. of Hawaii at Manoa)*; Gao, Xiaomeng *(Univ. of Hawaii at Manoa)*; Xu, Jia *(Univ. of Hawaii at Manoa)*; Boric-Lubecke, Olga *(Univ. of Hawaii Manoa)*

**11:05-11:20**                                          SaBT4.2

**Monitoring Peripheral Edema of Heart Failure Patients at Home: Device, Algorithm, and Clinic Study**
Yao, Jianchu* *(East Carolina University)*; Weaver, Elizabeth *(East Carolina University)*; Langley, Brandon *(East Carolina University)*; George, Stephanie *(East Carolina University)*; Hardin, Sonya *(East Carolina University)*

**11:20-11:35**                                          SaBT4.3

**A Low-Cost Video-Oculography System for Vestibular Function Testing**
Park, Jihwan *(Soonchunhyang Univ.)*; Kong, Youngsun *(Soonchunhyang Univ.)*; Nam, Y.* *(Soonchunhyang Univ.)*

**11:35-11:50**                                          SaBT4.4

**Modified Automatic R-Peak Detection Algorithm for Patients with Epilepsy using a Portable Electrocardiogram Recorder**
Jeppesen, Jesper* *(Aarhus Univ.)*; Beniczky, Sandor *(Danish Epilepsy Centre)*; Fuglsang-Frederiksen, Anders *(Dept. of Neurophysiology, Aarhus Univ. Hospital, 8000)*; Sidenius, Per *(Dept. of Neurology, Aarhus Univ. Hospital)*; Johansen, Peter *(Univ. of Aarhus, Faculty of Science and Technology)*

**11:50-12:05**                                          SaBT4.5

**Real-Time Estimation of Eye Gaze from In-Ear Electrodes**
Favre-Félix, Antoine* *(Eriksholm Research Centre)*; Graversen, Carina *(Eriksholm Research Centre)*; Dau, Torsten *(Technical University of Denmark)*; Lunner, Thomas *(Eriksholm Research Centre - part of Oticon)*

**12:05-12:20**                                          SaBT4.6

**PPG Pulse Direction Determination Algorithm for PPG Waveform Inversion by Wrist Rotation**
Choi, Changmok* *(Samsung Electronics Co., Ltd.)*; Ko, Byung-Hoon *(Samsung Advanced Institute of Technology)*; Lee, Jongwook *(Samsung Electronics)*; Yoon, Seung Keun *(Samsung Advanced Institute of Technology)*; Kwon, Uikun *(Samsung Electronics)*; Kim, Sang Joon *(Samsung Electronics)*; Kim, Youn Ho *(Samsung Advanced Institute of Technology)*

**10:50-11:05**                                          SaBT5.1

**NFC-Enabled, Tattoo-Like Stretchable Biosensor Manufactured by "Cut-and-Paste" Method**
Jeong, Hyoyoung *(University of Texas at Austin)*; Ha, Taewoo *(The University of Texas at Austin)*; Kuang, Irene *(The University of Texas at Austin)*; Shen, Linxiao *(University of Texas at Austin)*; Dai, Zhaohe *(The University of Texas at Austin)*; Sun, Nan *(University of Texas at Austin)*; Lu, Nanshu* *(University of Texas at Austin)*

**11:05-11:20**                                          SaBT5.2

**Impedimetric Investigation of Dual Electrical Properties of Reduced Graphene-Oxide-Based Biosensors in the Detection of Dopamine**
Lin, Shu-Ping* *(National Chung Hsing Univ.)*; Ciou, Jhong-Yi *(Graduate Institute of Biomedical Engineering, National Chung Hsi)*; Lai, Tung-Yen *(National Nano Device Laboratories)*; Lin, Tsung-Wu *(the Dept. of Chemistry, Tung Hai Univ.)*

**11:20-11:35**                                          SaBT5.3

**Estimating the Lower Leg Muscle Activity from Distal Biosignals Around the Ankles**
Isezaki, Takashi* *(University of Tsukuba)*; Watanabe, Tomoki *(NTT Corporation)*; Yamada, Tomohiro *(NTT)*; Kadone, Hideki *(University of Tsukuba)*; Suzuki, Kenji *(University of Tsukuba)*

**11:35-11:50**                                          SaBT5.4

**Tumor Size and Elasticity Estimation using Smartphone-Based Compression-Induced Scope**
Won, Chang-Hee* *(Temple University)*; Goldstein, Jesse *(Temple University)*; Oleksyuk, Vira *(Temple University)*; Caroline, Dina *(Temple University Hospital)*; Pascarella, Suzanne *(Temple University Hospital)*

**July 15 Saturday**

**11:50-12:05**  SaBT5.5
**Full Factorial Analysis of Variance to Assess Statistical Significance of Laplacian Estimation Accuracy Improvement Due to Novel Variable Inter-Ring Distances Concentric Ring Electrodes**
Makeyev, Oleksandr *(Diné College)*; Joe, Cody *(Diné College)*; Lee, Colin *(Diné College)*; Besio, W. G.* *(Univ. of Rhode Island)*

**12:05-12:20**  SaBT5.6
**RATT: RFID Assisted Tracking Tile – Preliminary Results**
Quiñones, Dario Ruben *(Center for Biomaterials and Tissue Engineering, Universitat Poli)*; Cuevas, Aarón *(Center for Biomaterials and Tissue Engineering, Universitat Poli)*; Cambra, Javier *(Center for Biomaterials and Tissue Engineering, Universitat Poli)*; Canals, Santiago *(Instituto de Neurociencias, Consejo Superior de Investigaciones)*; Moratal, David* *(Universitat Politècnica de València)*

**10:50-11:05**  SaBT6.1
**Development of a 3D Bio-Printed Construct with a Capillary-Like Network for Liver Tissue Engineering**
Lee, Jin Woo* *(Gachon University)*

**11:05-11:20**  SaBT6.2
**3D Integrated Organ Printing Technologies and Its Applications**
Kang, Hyun-Wook* *(Ulsan Natl. Institute of Science and Tech.)*

**11:20-11:35**  SaBT6.3
**Reconstruction of Cranio-Maxillofacial Bone Defect using 3D Printing based Patient Specific Implant with Biodegradable Biomaterials in Clinical Cases**
Shim, Jin-Hyung* *(Korea Polytechnic University)*; Han, Hyun Ho *(the Dept. of Plastic Surgery, College of Medicine, The Cath)*; Lee, Hyungseok *(Dept. of Mechanical Engineering, Pohang University of Scien)*; Lee, Jeong-Seok *(Dept. of Mechanical Engineering, Korea Polytechnic Universi)*; Yun, Won-Soo *(Dept. of Mechanical Engineering, Korea Polytechnic Universi)*; Baek, Chung-Hwan *(Dept. of Otorhinolaryngology-Head and Neck Surgery, Sungkyu)*; Rhie, Jong-Won *(the Dept. of Plastic Surgery, College of Medicine, The Cath)*; Cho, Dong-Woo *(Dept. of Mechanical Engineering, Pohang University of Scien)*

**11:35-11:50**  SaBT6.4
**3D Cell Printing of Microfluidic Channel for Perfusable Blood Vessel**
Park, Ju Young* *(POSTECH)*; Ryu, Hyunryul *(Seoul National University)*; Lee, Byungjun *(School of Mechanical and Aerospace Engineering, Seoul National U)*; Jeon, Noo Li *(Seoul National University)*; Cho, Dong-Woo *(Dept. of Mechanical Engineering, Pohang University of Scien)*

**11:50-12:05**  SaBT6.5
**3D Bioprinting of Multi-Composition Stem Cell Patch using Tissue-Specific Bioinks**
Jang, Jinah* *(POSTECH)*; Kim, Seok-Won *(POSTECH)*; Park, Ju Young *(POSTECH)*; Kim, Sung Won *(The Catholic Univ. of Korea)*; Kwon, Sang-Mo *(Pusan National Univ.)*; Park, Hun-Jun *(St. Mary's Hospital, The Catholic Univ. of Korea)*; Cho, Dong-Woo *(Dept. of Mechanical Engineering, Pohang Univ. of Scien)*

**10:50-11:05**  SaBT7.1
**Analysis of Muscle Activation in Lower Extremity for Static Balance**
Chakravarty, Kingshuk *(Tata Consultancy Services Ltd.)*; Chatterjee, Debatri *(TCS Innovation Lab)*; Das, Rajat Kumar *(TCS Innovation Lab)*; Tripathy, Soumya Ranjan *(TCS Research and Innovation, Tata Consultancy Services Ltd.)*; Sinha, Aniruddha* *(Tata Consultancy Services Ltd.)*

**11:05-11:20**  SaBT7.2
**A New Robotic Approach to Characterize Mechanical Impedance and Energetic Passivity of the Human Ankle during Standing**
Lee, Hyunglae* *(Arizona State University)*; Nalam, Varun *(Arizona State University)*

**11:20-11:35**  SaBT7.3
**Design and Control of a 3-DOF Rehabilitation Robot for Forearm and Wrist**
Luo, Lincong *(Institute of Automation, Chinese Academy of Sciences)*; Peng, Liang *(Institute of Automation, Chinese Academy of Sciences)*; Hou, Zeng-Guang* *(Institute of Automation, Chinese Academy of Sciences)*; Wang, Weiqun *(Institute of Automation, Chinese Academy of Sciences)*

**11:35-11:50**  SaBT7.4
**Estimation of Tibialis Anterior Muscle Stiffness during the Swing Phase of Walking with Various Footwear**
Uchiyama, Takanori* *(Keio University)*; Hori, Yutaka *(Keio University)*; Suzuki, Kenta *(Keio University)*

**11:50-12:05**  SaBT7.5
**Design of Anisotropic Pneumatic Artificial Muscles and their Applications to Soft Wearable Devices for Text Neck Symptoms**
Kim, Hojoong *(Seoul National University)*; Park, Hyuntai *(Seoul National University)*; Kim, Jongwoo *(Biorobotics LAB, Seoul National University)*; Cho, Kyu-Jin *(Seoul National University)*; Park, Yong-Lae* *(Carnegie Mellon University)*

**12:05-12:20**  SaBT7.6
**Impact of Actuator Impedance Characteristics on Motor Control of Assisted Hand Movements**
Sandri Heidner, Gustavo *(The Catholic University of America)*; Vermillion, Billt *(Catholic University of America)*; Lee, Sang Wook* *(Catholic University of America)*

**10:50-11:05**  SaBT8.1
**Decoding Emotional Valence from Electroencephalographic Rhythmic Activity**
Celikkanat, Hande* *(Univ. of Helsinki)*; Moriya, Hiroki *(ATR Cognitive Mechanisms Laboratories)*; Ogawa, Takeshi *(ATR Cognitive Mechanisms Laboratories)*; Kauppi, Jukka-Pekka *(Univ. of Jyväskylä)*; Kawanabe, Motoaki *(ATR Cognitive Mechanisms Laboratories)*; Hyvärinen, Aapo *(Univ. of Helsinki)*

**11:05-11:20**  SaBT8.2
**Self-Regulation of Primary Motor Cortex Activity with Motor Imagery Induces Functional Connectivity Modulation: A Real-Time fMRI Neurofeedback Study**
Makary, Meena M.* *(Kyung Hee University)*; Eun, Seulgi *(Kyung Hee University)*; Park, Kyungmo *(Kyung Hee University)*

**11:20-11:35**  SaBT8.3
**Identifying the Effects of Microsaccades in Tripolar EEG Signals**
Bellisle, Rachel* *(University of Rhode Island)*; Steele, Preston *(CREmedical Corp., Kingston, RI)*; Bartels, Rachel *(CREmedical Corp.)*; Ding, Lei *(University of Oklahoma)*; Sunderam, Sridhar *(University of Kentucky)*; Besio, W. G. *(University of Rhode Island)*

**11:35-11:50**  SaBT8.4
**Decreased Variability of Dynamic Phase Synchronization in Brain Networks during Hand Movement**
Cheng, Lin *(Shanghai Jiao Tong University)*; Zhu, Hong *(Shanghai Jiao Tong University)*; Zhu, Yang *(Shanghai Second People's Hospital)*; He, Naying *(Shanghai Jiao Tong University)*; Yang, Yang *(Shanghai Second People's Hospital)*; Ling, Huawei *(Shanghai Jiao Tong University)*; Tong, Shanbao *(Shanghai Jiao Tong University)*; Fu, Yi *(Rui Jin Hospital, Shanghai Jiao Tong University School of Medici)*; Sun, Junfeng* *(Shanghai Jiao Tong University)*

**11:50-12:05**                                      SaBT8.5

**EEG-Based Biometry using Steady State
Visual Evoked Potentials**

Falzon, Owen* *(University of Malta)*; Zerafa, Rosanne
*(University of Malta)*; Camilleri, Tracey *(University of Malta)*;
Camilleri, Kenneth Patrick *(University of Malta)*

**12:05-12:20**                                      SaBT8.6

**Passive Functional Mapping Guides Electrical Cortical
Stimulation for Efficient Determination of Eloquent
Cortex in Epilepsy Patients**

Prueckl, Robert* *(g.tec medical engineering GmbH)*; Kapeller,
Christoph *(g.tec medical engineering GmbH)*; Gruenwald,
Johannes *(Johannes Kepler Univ. Linz)*; Ogawa, Hiroshi
*(Asahikawa Medical Univ.)*; Kamada, Kyousuke *(Asahikawa
Medical Univ.)*; Korostenskaja, Milena *(Florida Hospital for
Children, Comprehensive Pediatric Epilepsy)*; Swift, James
*(g.tec neurotechnologies USA)*; Scharinger, Josef *(Dept. of
Computational Perception, Johannes Kepler Universi)*; Cho,
Woosang *(Univ. of Tubingen)*; Edlinger, Günter *(g.tec medical
engineering GmbH)*; Guger, Christoph *(g.tec medical
engineering GmbH)*

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**SaBT9:  10:50-12:20**                            Plonsey Room
**Human Performance I** (Oral Session)
**Chair:**  Huang, Yufei *(University of Texas at San Antonio)*

**10:50-11:05**                                      SaBT9.1

**Prediction of Fatigue-Related Driver Performance
from EEG Data by Deep Riemannian Model**

Hajinoroozi, Mehdi* *(The University of Texas at San Antonio)*;
Zhang, Jianqiu (Michelle) *(University of Texas at San Antonio,
Electrical and Computer Engi)*; Huang, Yufei *(University of
Texas at San Antonio)*

**11:05-11:20**                                      SaBT9.2

**Assessment of Auditory Impression of the Coolness and
Warmness of Automotive HVAC Noise**

Nakagawa, Seiji* *(Chiba University)*; Hotehama, Takuya
*(National Institute of Advanced Industrial Science and
Technology)*; Kamiya, Masaru *(Denso Corporation)*

**11:20-11:35**                                      SaBT9.3

**Virtual Reality Body Motion Induced Navigational Controllers
and their Effects on Simulator Sickness and Pathfinding**

Aldaba, Cassandra* *(University of Manitoba)*; White, Paul
*(University of Manitoba)*; Byagowi, Ahmad *(University of
Manitoba)*; Moussavi, Zahra *(University of Manitoba)*

**11:35-11:50**                                      SaBT9.4

**Hedonic Editing and Order Effect in Decision-Making with
Neurometric Evaluation**

Babiloni, Fabio* *(University of Rome)*; Yang, Wenting *(Dept. of
Psychology and Behavioral Science, Zhejiang Univer)*; Di
Flumeri, Gianluca *(University of Rome Sapienza)*

**11:50-12:05**                                      SaBT9.5

**Bayesian Multi-Subject Factor Analysis to Predict
Microsleeps from EEG Power Spectral Features**

Shoorangiz, Reza* *(University of Canterbury)*; Weddell,
Stephen J. *(University of Canterbury)*; Jones, Richard D. *(New
Zealand Brain Research Institute)*

**12:05-12:20**                                      SaBT9.6

**A System for Accelerometer-Based Gesture Classification
using Artificial Neural Networks**

Stephenson, Robert *(University of Technology Sydney)*; Naik,
Ganesh R *(University of Technology Sydney)*; Chai, Rifai*
*(University of Technology, Sydney)*

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**SaBT10:  10:50-12:20**                           Schmitt Room
**Health Informatics – Decision Support Methods
and Systems I** (Oral Session)
**Chair:**  Nguyen, Hung T. *(University of Technology, Sydney)*

**10:50-11:05**                                     SaBT10.1

**Stenosis Detection and Quantification on Cardiac CTA using
Panoramic MIP of Coronary Arteries**

Chi, Yanling* *(Institute for Infocomm Research)*; Huang, Weimin
*(Institute for Infocomm Research, Agency for Science
Technology a)*; Zhou, Jiayin *(Institute for Infocomm Research)*;
Toe, Kyaw Kyar *(Institute for Infocomm Research, A\*STAR)*;
Zhang, Jun-Mei *(National Heart Center)*; Wong, Philip *(National
Heart Centre Singapore)*; Lim, Soo Teik *(National Heart Centre
Singapore)*; Tan, Ru San *(National Heart Center)*; Zhong, Liang
*(National Heart Centre Singapore)*

**11:05-11:20**                                     SaBT10.2

**Online SVM-Based Personalizing Method for the
Drowsiness Detection of Drivers**

Choi, Minho* *(Pohang University of Science and Technology
(POSTECH))*; Kim, Sang Woo *(Pohang University of Science
and Technology (POSTECH), Dept.)*

**11:20-11:35**                                     SaBT10.3

**Intuitive and Interpretable Visual Communication of a
Complex Statistical Model of Disease Progression and Risk**

Li, Jieyi *(University of St Andrews)*; Arandjelovic, Ognjen*
*(University of St Andrews)*

**11:35-11:50**                                     SaBT10.4

**A Non-Exercise based V02max Prediction using FRIEND
Dataset with a Neural Network**

Henriques, Jorge* *(Univ. of Coimbra)*; de Carvalho, Paulo
*(Univ. of Coimbra)*; Rocha, Teresa *(Inst Superior de Eng de
Coimbra)*; Paredes, Simao *(Instituto Politécnico de Coimbra)*;
Cabiddu, Ramona *(Cardiopulmonary Physiotherapy Lab,
Federal Univ. of)*; Trimer, Renata *(Cardiopulmonary
Physiotherapy Lab, Federal Univ. of)*; Mendes, Renata
*(Cardiopulmonary Physical Therapy Lab, Dept. of Physi)*;
Borghi-Silva, Audrey *(Cardiopulmonary Physiotherapy Lab,
Federal Univ. of)*; Lenny, Kaminsky *(Fisher Institute of Health
and Well-Being and Clinical Exercise)*; Euan, Ashley *(Division
of Cardiovascular Medicine, VA Palo Alto Healthcare Sys)*;
Arena, Ross *(Univ. of Illinois at Chicago)*; Myers, Jonathan
*(Dept. of Cardiovascular Medicine, Stanford Univ., Palo)*

**11:50-12:05**                                     SaBT10.5

**Prediction of Hip Fracture in Post-Menopausal Women using
Artificial Neural Network Approach**

Ho-Le, Thao P.* *(University of Technology, Sydney, Australia)*;
Center, Jackie R *(Garvan Institute of Medical Research)*;
Eisman, John A. *(Garvan Institute of Medical Research)*;
Nguyen, Tuan V. *(University of Technology, Sydney, Australia)*;
Nguyen, Hung T. *(University of Technology, Sydney)*

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**SaBT11:  10:50-12:20**                          Greatbatch Room
**Whole-Body, Organ, and Tissue
Computational Models** (Oral Session)
**Chair:**  Dokos, Socrates *(University of New South Wales)*

**10:50-11:05**                                     SaBT11.1

**Evaluation of Ultrasonic Scattering for Different Cortical Bone
Porosities and Excitation Frequencies: A Numerical Study**

Potsika, Vassiliki *(Unit of Medical Tech. and Intelligent Info.
Systems,)*; Grivas, Konstantinos *(Dept. of Mechanical Engineering
and Aeronautics, Univ.)*; Gortsas, Theodoros *(Dept. of Mechanical
Engineering and Aeronautics, Univ.)*; Protopappas, Vasilios C.
*(Univ. of Patras)*; Polyzos, Demosthenes *(Univ. of Patras)*;
Fotiadis, Dimitrios I.* *(Univ. of Ioannina)*

**11:05-11:20**                                     SaBT11.2

**A Framework for Simulating Gastric Electrical Propagation in
Confocal Microscopy Derived Geometries**

Krohn, Berit *(Univ. of Stuttgart)*; Sathar, Shameer *(Univ. of
Auckland)*; Röhrle, Oliver *(Univ. of Stuttgart)*; Vanderwinden,
Jean-Marie *(Univ. libre de Bruxelles)*; O'Grady, Gregory *(Univ.
of Auckland)*; Cheng, Leo K* *(The Univ. of Auckland)*

**11:20-11:35**  SaBT11.3
**Anatomical Variations of the Stomach Effects on Electrogastrography**
Calder, Stefan* *(Auckland Bioengineering Institute, Univ. of Auckland)*; O'Grady, Gregory *(Univ. of Auckland)*; Cheng, Leo K *(The Univ. of Auckland)*; Du, Peng *(The Univ. of Auckland)*

**11:35-11:50**  SaBT11.4
**Image-Based Fluid Dynamics Analysis of Left Ventricle Outflow Tract Pressure Gradient after Deployment Transcatheter Mitral Valve**
Alharbi, Yousef S* *(University of New South Wales, Biomedical Engineering)*; Lovell, Nigel H. *(University of New South Wales)*; Otton, James *(Cardiology Dept., Liverpool Hospital, Sydney)*; Muller, David *(Cardiology Dept., St Vincent's Hospital, Sydney)*; Al Abed, Amr *(University of New South Wales)*; Dokos, Socrates *(University of New South Wales)*

**11:50-12:05**  SaBT11.5
**The Visible Human Project Male CAD based Computational Phantom and Its use in Bioelectromagnetic Simulations**
Noetscher, Gregory* *(Worcester Polytechnic Institute)*; Htet, Aung Thu *(Worcester Polytechnic Institute)*; Maino, Nicholas *(Worcester Polytechnic Institute)*; Lacroix, Patrick *(wpi)*

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**SaBT12:** 10:50-12:20  Geddes Room
**Diagnostic Devices I** (Oral Session)
**Chair:** Iordachita, Iulian *(Johns Hopkins University)*

**10:50-11:05**  SaBT12.1
**Evaluation of a Laser-Based Sensor for the Diagnosis of Neurological Disorders**
Tenner, Felix* *(Lehrstuhl für Photonische Technologien)*; Regensburger, Martin *(Clinic of Neurology, Friedrich-Alexander-Universität Erlangen-Nü)*; Schramm, Axel *(University Hospital Erlangen)*; Söhle, Mona *(Institute of Photonic Technologies, Friedrich-Alexander-University)*; Schwarzkopf, Karen *(Institute of Photonic Technologies, Friedrich-Alexander-University)*; Zalevsky, Zeev *(Nano Photonics Center at the Institute of Nanotechnology and Adv)*; Schmidt, Michael *(Institute of Photonic Technologies, Friedrich-Alexander-University)*

**11:05-11:20**  SaBT12.2
**A Bioimpedance Sensing System for In-Vivo Cancer Tissue Identification: Design and Preliminary Evaluation**
Carpano Maglioli, Camilla* *(Fondazione Istituto Italiano di Tecnologia)*; Caldwell, Darwin G. *(Italian Institute of Technology)*; Mattos, Leonardo *(IIT - Istituto Italiano di Tecnologia)*

**11:20-11:35**  SaBT12.3
**Automatic Characterization of User Errors in Spirometry**
Luo, Andrew* *(Univ. of Washington)*; Whitmire, Eric *(Univ. of Washington)*; Stout, James *(Univ. of Washington)*; Martenson, Drew *(Glendale Adventist Medical Center)*; Patel, Shwetak *(Univ. of Washington)*

**11:35-11:50**  SaBT12.4
**Robot-Assisted Mirroring Exercise as a Physical Therapy for Hemiparesis Rehabilitation**
Kim, Jihun *(Handong Global University)*; Kim, Jaehyo* *(Handong Global University)*

**11:50-12:05**  SaBT12.5
**PhoneQuant: A Smartphone-Based Quantitative Immunoassay Analyser**
Shah, Malay Ilesh* *(Healthcare Technology Innovation Center (HTIC), Indian Institute)*; Joseph, Jayaraj *(HTIC, Indian Institute of Technology Madras)*; Sanne, Ujwal Sriharsha *(Birla Institute of Technology and Science, Pilani)*; Sivaprakasam, Mohanasankar *(Indian Institute of Technology Madras)*

**12:05-12:20**  SaBT12.6
**A New 4-DOF Parallel Robot for MRI-Guided Percutaneous Interventions: Kinematic Analysis**
Kim, Jin Seob *(Johns Hopkins University)*; Levi, David *(Johns Hopkins University)*; Monfaredi, Reza *(Children's National Health System)*; Cleary, Kevin *(Children's National Medical Center)*; Iordachita, Iulian* *(Johns Hopkins University)*

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**SaBT13:** 10:50-12:20  Dunn Room
**Bioinformatics – Computational Modeling and Simulations in Biology, Physiology and Medicine I** (Oral Session)
**Chair:** Baranoski, Gladimir Valerio Guimaraes *(Univ. of Waterloo)*

**10:50-11:05**  SaBT13.1
**Transient Reduction in Theta Power Caused by Interictal Spikes in Human Temporal Lobe Epilepsy**
Ge, Manling* *(Hebei Univ. of Technology)*; Guo, Jundan *(Hebei Univ. of Technology)*; Xing, Yangyang *(Hebei Univ. of Technology)*; Feng, Zhiguo *(Hebei Univ. of Technology)*; Lu, Weide *(Hebei Univ. of Technology)*; Ma, Xinxin *(Hebei Univ. of Technology)*; Geng, Yuehua *(Hebei Univ. of Technology)*; Zhang, Xin *(Tianjin Polytechnic Univ.)*

**11:05-11:20**  SaBT13.2
**On the Detection of Peripheral Cyanosis in Individuals with Distinct Levels of Cutaneous Pigmentation**
Baranoski, Gladimir Valerio Guimaraes* *(University of Waterloo)*; Van Leeuwen, Spencer Richard *(University of Waterloo)*; Chen, Tenn Francis *(University of Waterloo)*

**11:20-11:35**  SaBT13.3
**A New Alignment Free Genome Comparison Algorithm based on Statistically Estimated Feature Frequency Profile**
Seo, Hyein *(Korea Advanced Institute of Science and Technology (KAIST))*; Cho, Dong-Ho* *(Korea Advanced Institute of Science and Technology (KAIST))*

**11:35-11:50**  SaBT13.4
**Using Convolutional Neural Networks to Explore the Microbiome**
Reiman, Derek *(University of Illinois at Chicago)*; Metwally, Ahmed* *(University of Illinois at Chicago)*; Dai, Yang *(University of Illinois at Chicago)*

**11:50-12:05**  SaBT13.5
**Modeling the Effects of Amiodarone on Short QT Syndrome Variant 2 in the Human Ventricles**
Luo, Cunjin* *(Harbin Institute of Technology, School of Computer Science and T)*; Wang, Kuanquan *(Harbin Institute of Technology)*; Zhang, Henggui *(Harbin Institute of Technology, School of Computer Science and T)*

**12:05-12:20**  SaBT13.6
**Rendering Problem-Oriented CCD for Chronic Diseases**
Bae, Sungchul* *(Kyungpook National University)*; Kim, Il Kon *(Kyungpook National University)*; Lee, Do-Youn *(Kyungpook National University)*

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**SaBT14:** 10:50-12:20  Schaldach Room
**Imaging in Mobile Health** (Oral Session)
**Chair:** Karlen, Walter *(ETH Zurich)*

**10:50-11:05**  SaBT14.1
**Automatic Diagnosis of Melanoma using Linear and Nonlinear Features from Digital Image**
Munia, Tamanna Tabassum Khan *(University of North Dakota)*; Alam, Md Nafiul *(University of North Dakota)*; Neubert, Jeremiah *(University of North Dakota)*; Fazel-Rezai, Reza* *(University of North Dakota)*

**11:05-11:20**  SaBT14.2
**Improving ROI Detection in Photoplethysmographic Imaging with Thermal Cameras**
Scebba, Gaetano* *(ETH Zurich)*; Dragas, Jelena *(ETH Zurich)*; Hu, Suyi *(ETH Zürich)*; Karlen, Walter *(ETH Zurich)*

**11:20-11:35**  SaBT14.3
**Smartphone based Automatic Organ Validation in Ultrasound Video**
Vaish, Pallavi* *(Indian Institute of Tech. Hyderabad)*; Ramkrishna, Bharath *(Indian institute of Tech. Hyderabad)*; P, Rajalakshmi *(Indian Institute of Tech. Hyderabad)*

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**11:35-11:50**                                                      SaBT14.4
**Considerations of Handheld Breathing Tracking via a Stabilized Eulerian Video Magnification Approach**
Alam, Shafaf *(University of Queensland)*; Singh, Surya P. N.* *(University of Queensland)*; Abeyratne, Udantha R *(University of Queensland)*

**11:50-12:05**                                                      SaBT14.5
**Neurological Activity Monitoring based on Video Inpainting**
Schmale, Sebastian* *(University of Bremen)*; Seidel, Pascal *(University of Bremen)*; Thiermann, Steffen *(University of Bremen)*; Paul, Steffen *(University of Bremen)*

**12:05-12:20**                                                      SaBT14.6
**A Study of Color Illumination Effect on the SNR of rPPG Signals**
Lin, Yu-Chen* *(National Taiwan University of Science and Technology)*; Lin, Yuan-Hsiang *(National Taiwan University of Science and Technology)*

**10:50-11:05**                                                      SaBT15.1
**Audible Capnometric Cues with End-Tidal Carbon Dioxide Improve the Quality of Patient Monitoring**
Aoki, Toshiki* *(Nihon Kohden Corporation)*; Inoue, Masayuki *(Nihon Kohden Corporation)*; Miyasaka, Kiyoyuki *(St. Luke's International University)*

**11:05-11:20**                                                      SaBT15.2
**DeepPredict: A Deep Predictive Intelligence Platform for Patient Monitoring**
Chwyl, Brendan* *(University of Waterloo)*; Chung, Audrey Gina *(University of Waterloo)*; Shafiee, Mohammad Javad *(University of Waterloo)*; Fu, Yongji *(Becton Dickinson Technologies)*; Wong, Alexander *(University of Waterloo)*

**11:20-11:35**                                                      SaBT15.3
**Design, Implementation, and Evaluation of a Physiological Closed-Loop Control Device for Medically-Induced Coma**
An, Jingzhi* *(MIT)*; Purdon, Patrick L *(Massachusetts General Hospital)*; Solt, Ken *(Massachusetts General Hospital)*; Sims, Nat *(MGH)*; Brown, Emery N *(MGH-Harvard Medical School-MIT)*; Westover, Brandon *(Massachusetts General Hospital)*

**11:35-11:50**                                                      SaBT15.4
**A Novel Smart Lighting Clinical Testbed**
Gleason, Joseph D. *(The University of New Mexico)*; Oishi, Meeko* *(University of New Mexico)*; Simkulet, Michelle *(Rensselaer Polytechnic Institute)*; Arunas, Tuzikas *(Rensselaer Polytechnic Institute)*; Brown, Lee *(The University of New Mexico)*; Brueck, S. R. J. *(The University of New Mexico)*; Karlicek, Robert F. *(Rensselaer Polytechnic Institute)*

**11:50-12:05**                                                      SaBT15.5
**The Challenge of Magnetic Vagal Nerve Stimulation for Myocardial Infarction – Preliminary Clinical Trial**
Nishikawa, Takuya* *(Kyushu Univ.)*; Saku, Keita *(Kyushu Univ.)*; Todaka, Koji *(Kyushu Univ.)*; Kuwabara, Yukimitsu *(Kyushu Univ.)*; Arai, Shinobu *(Nakamura Gakuen Univ.)*; Kishi, Takuya *(Kyushu Univ. Graduate School of Medical Sciences)*; Ide, Tomomi *(Kyushu Univ.)*; Tsutsui, Hiroyuki *(Kyushu Univ.)*; Sunagawa, Kenji *(Kyushu Univ.)*

**12:05-12:20**                                                      SaBT15.6
**Design of a Compact Collimator and 3D Imaging System for a Scanning Beam Low-Energy Intraoperative Radiation Therapy System for Pancreatic Cancer**
Wears, Brennen *(University of Iowa)*; Mohiuddin, Imran *(University of Iowa)*; Flynn, Ryan *(University of Iowa)*; Kim, Yusung *(Dept. of Radiation Oncology, The University of Iowa, Iowa C)*; Waldron, Timothy *(University of Iowa)*; Allen, Bryan *(University of Iowa)*; Xia, Junyi* *(University of Iowa)*

**10:50-11:05**                                                      SaBT16.1
**Visible Forceps Manipulator with Novel Linkage Bending Mechanism for Neurosurgery**
Zhang, Boyu *(Tsinghua University)*; Liao, Zhuxiu *(Tsinghua University)*; Liao, Hongen* *(Tsinghua University;)*

**11:05-11:20**                                                      SaBT16.2
**A Targeted Drug Delivery Platform for Assisting Retinal Surgeons for Treating Age-Related Macular Degeneration (AMD)**
Nasseri, M. Ali* *(Technische Universitaet Muenchen)*; Maier, Mathias *(Klinikum Rechst der isaar, Muenchen)*; Lohmann, Chris *(Klinikum Rechst der isaar, Muenchen)*

**11:20-11:35**                                                      SaBT16.3
**Needle Release Mechanism Enabling Multiple Insertions with an Ultrasound-Guided Prostate Brachytherapy Robot**
Chen, Shuyang *(Johns Hopkins Univ.)*; Gonenc, Berk *(Johns Hopkins Univ.)*; Li, Meng *(Johns Hopkins Univ.)*; Song, Daniel *(Johns Hopkins Univ.)*; Burdette, Everette *(Acoustic MedSystems, Inc.)*; Iordachita, Iulian *(Johns Hopkins Univ.)*; Kazanzides, Peter* *(Johns Hopkins Univ.)*

**11:35-11:50**                                                      SaBT16.4
**A Master-Slave Control System with Workspaces Isomerism for Teleoperation of a Snake Robot**
Ren, Lingxue* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Olatunji Mumini, Omisore *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Shipeng, Han *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Wang, Lei *(Shenzhen Institutes of Advanced Technology)*

**11:50-12:05**                                                      SaBT16.5
**Statistical Modeling on Motion Trajectories for Robotic Laparoscopic Surgery**
Yang, Tao* *(Institute of Infocomm Research)*; Huang, Weimin *(Institute for Infocomm Research, Agency for Science Technology a)*; Toe, Kyaw Kyar *(Institute for Infocomm Research, A*STAR)*

**10:50-11:05**                                                      SaBT17.1
**Estimating Brain Connectivity when Few Data Points are Available: Perspectives and Limitations**
Antonacci, Yuri *(University of Rome Sapienza)*; Toppi, Jlenia *(University of Rome "Sapienza")*; Anzolin, Alessandra *(Univ. of Rome "Sapienza", Neuroelectrical Imaging and BCI Lab IR)*; Caschera, Stefano *(Sapienza University of Rome)*; Mattia, Donatella *(Fondazione Santa Lucia IRCCS)*; Astolfi, Laura* *(University of Rome Sapienza)*

**11:05-11:20**                                                      SaBT17.2
**Connectome Pattern Alterations with Increment of Mental Fatigue in One-Hour Driving Simulation**
Chua, Bing Liang *(National University of Singapore)*; Dai, Zhongxiang *(Singapore Institute for Neurotechnology (SINAPSE), Centre for Li)*; Bezerianos, Anastasios* *(National University of Singapore)*; Thakor, Nitish *(Johns Hopkins University)*; Sun, Yu *(National University of Singapore)*

**11:20-11:35**                                                      SaBT17.3
**Transcranial Cerebellar Direct Current Stimulation: Effects on Brain Resting State Oscillatory and Network Activity**
Petti, Manuela* *(Univ. of Rome "Sapienza", Neuroelectrical Imaging and BCI Lab IR)*; Astolfi, Laura *(University of Rome Sapienza)*; Masciullo, Marcella *(Fondazione Santa Lucia, Rome, Italy)*; Clausi, Silvia *(Fondazione Santa Lucia, Rome, Italy)*; Pichiorri, Floriana *(Fondazione Santa Lucia, IRCCS, Rome, Italy)*; Cincotti, Febo *(Sapienza University of Rome)*; Mattia, Donatella *(Fondazione Santa Lucia IRCCS)*; Molinari, Marco *(Fondazione Santa Lucia, Rome, Italy)*

**July 15 Saturday**

**11:35-11:50**                                                       SaBT17.4

**Asymmetry of Hemispheric Interdependences in the
Early Hours following Unilateral Stroke:
An Electrophysiological Study in Rats**

Guo, Xiaoli *(Shanghai Jiao Tong University)*; Wu, Wenqing
*(Shanghai Jiao Tong University)*; Tong, Shanbao\* *(Shanghai
Jiao Tong University)*

**11:50-12:05**                                                       SaBT17.5

**Estimating Directed Brain-Brain and Brain-Heart Connectivity
through Globally Conditioned Granger Causality Approaches**

Duggento, Andrea\* *(Univ. of Rome "Tor Vergata")*; Passamonti,
Luca *(Univ. of Cambridge)*; Guerrisi, Maria *(Univ. of Rome "Tor
Vergata")*; Valenza, Gaetano *(Univ. of Pisa)*; Barbieri, Riccardo
*(Politecnico di Milano)*; Toschi, Nicola *(Univ. of Rome "Tor
Vergata", Faculty of Medicine)*

**12:05-12:20**                                                       SaBT17.6

**Simultaneous Estimation of the In-Mean and In-Variance
Causal Connectomes of the Human Brain**

Duggento, Andrea\* *(University of Rome "Tor Vergata")*;
Passamonti, Luca *(University of Cambridge)*; Guerrisi, Maria
*(University of Rome "Tor Vergata")*; Toschi, Nicola *(University
of Rome "Tor Vergata", Faculty of Medicine)*

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**SaBT18:  10:50-12:20**                                    Montgomery Hall
**Time-Frequency and Time-Scale Analysis –
Neural Signals** (Oral Session)
**Chair:**  Wang, Yiwen *(Hong Kong Univ. of Science and Technology)*

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**10:50-11:05**                                                       SaBT18.1

**A Marked Point Process Approach for Identifying Neural
Correlates of Tics in Tourette Syndrome**

Loza, Carlos\* *(Univ. of Florida)*; Shute, Jonathan *(Univ. of
Florida)*; Principe, Jose *(Univ. of Florida)*; Okun, Michael *(Univ.
of Florida)*; Gunduz, Aysegul *(Univ. of Florida)*

**11:05-11:20**                                                       SaBT18.2

**Measuring Brain Activation by using Baseline-Normalized
Event-Related Spectral Perturbation in Working Memory Task**

Phukhachee, Tustanah\* *(King Mongkut's University of
Technology Thonburi)*; Maneewongvatana, Suthathip *(King
Mongkut's University of Technology Thonburi)*; Iramina, Keiji
*(Kyushu University)*; Angsuwatanakul, Thanate *(Kyushu
University)*; Kaewkamnerdpong, Boonserm *(Biological
Engineering Program, Faculty of Engineering, King Mon)*

**11:20-11:35**                                                       SaBT18.3

**Real-Time Analysis on Ensemble SVM Scores to Reduce
P300-Speller Intensification Time**

Vo, Anh Kha\* *(University of Technology Sydney)*; Nguyen, Diep
N. *(University of Technology Sydney)*; Ha, Hoang Kha
*(HoChiMinh City University of Technology)*; Dutkiewicz, Eryk
*(University of Technology Sydney)*

**11:35-11:50**                                                       SaBT18.4

**Evaluation of Logarithmic vs. Linear ADCs for Neural Signal
Acquisition and Reconstruction**

Pagin, Matteo\* *(University of Ulm)*; Ortmanns, Maurits
*(University of Ulm)*

**11:50-12:05**                                                       SaBT18.5

**Quality Assessment of 3D Visualizations with Vertical
Disparity: An ERP Approach**

Shahbazi Avarvand, Forooz *(Fraunhofer HHI)*; Bosse,
Sebastian *(Fraunhofer HHI)*; Nolte, Guido *(Dept. of
Neurophysiology, UKE, Hamburg)*; Wiegand, Thomas *(HHI)*;
Samek, Wojciech\* *(Fraunhofer HHI)*

**12:05-12:20**                                                       SaBT18.6

**Detecting Abrupt Change in Neuronal Tuning
via Adaptive Point Process Estimation**

Chen, Junjun *(Zhejiang University)*; Xu, Kai *(Zhejiang
University)*; Yang, Zaiyue *(Zhejiang University)*; Wang, Yiwen\*
*(Hong Kong University of Science and Technology)*

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**SaCT2:  14:20-15:50**                                            Cho Room
**Optical Imaging II** (Oral Session)

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**14:20-14:35**                                                       SaCT2.1

**Statistical Modeling of OCT Images by Asymmetric
Normal Laplace Mixture Model**

Jorjandi, Sahar *(MUI)*; Rabbani, Hossein\* *(Isfahan Univ. of
Medical Sciences)*; Kafieh, Rahele *(Isfahan University of
Medical Sciences)*; Amini, Zahra *(MUI)*

**14:35-14:50**                                                       SaCT2.2

**Tooth Cracks Detection and Gingival Sulcus Depth
Measurement using Optical Coherence Tomography**

Kang, Se Ryong *(Seoul National Univ.)*; Kim, Jun-Min *(Seoul
Univ.)*; Yi, WonJin\* *(Seoul National Univ Sch of Dentistry)*

**14:50-15:05**                                                       SaCT2.3

**Smart Data Augmentation for Surgical Tool
Detection on the Surgical Tray**

Alhajj, Hassan\* *(Inserm)*; Lamard, Mathieu *(Université de
Bretagne Occidentale)*; Cochener, Béatrice *(CHU Morvan)*;
Quellec, Gwenole *(Inserm)*

**15:05-15:20**                                                       SaCT2.4

**Pyramid Approach for the Reduction of Parallax-Related
Artefacts in Optical Recordings of Moving Translucent Volumes**

Flotho, Philipp\* *(Systems Neuroscience and Neurotechnology
Unit)*; Romero Santiago, Alejandro E. *(Saarland Univ.)*;
Schwerdtfeger, Karsten *(Saarland Univ. Hospital)*; Hülser,
Matthias *(Saarland Univ. Hospital)*; Haab, Lars *(Saarland Univ.
Hospital)*; Strauss, Daniel J. *(Saarland Univ., Medical Faculty)*

**15:20-15:35**                                                       SaCT2.5

**Non-Rigid Registration of Fluorescein Angiography and
Optical Coherence Tomography via Scanning Laser
Ophthalmoscope Imaging**

Rabbani, Hossein\* *(Isfahan Univ. of Medical Sciences)*;
Mokhtary, Marzieh *(Isfahan University of Medical Sciences)*;
Ghasemi Kamasi, Zeinab *(West Virginia University)*

**15:35-15:50**                                                       SaCT2.6

**Motion Estimation of Subcellular Structures from
Fluorescence Microscopy Images**

Vallmitjana, Alex *(Automatic Control Dept., Universitat
Politecnica de Catalun)*; Civera-Tregon, Azahara
*(Neurogenetics and Molecular Medicine, Sant Joan de Deu
Research)*; Hoenicka, Janet *(Instituto de Recerca Hospital Sant
Joan de Deu, Barcelona)*; Palau, Francesc *(Neurogenetics and
Molecular Medicine, Sant Joan de Deu Research)*; Benitez,
Raul\* *(Universitat Politecnica de Catalunya)*

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**SaCT4:  14:20-15:50**                                            Min Room
**Physiological and Behavioral Monitoring** (Oral Session)

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**14:20-14:35**                                                       SaCT4.1

**A Wearable Textile for Respiratory Monitoring:
Feasibility Assessment and Analysis of Sensors
Position on System Response**

Lo Presti, Daniela\* *(Campus Bio-Medico di Roma University)*;
Massaroni, Carlo *(Università Campus Bio-Medico di Roma)*;
Saccomandi, Paola *(University Campus Bio-Medico di Roma)*;
Caponero, Michele Arturo *(ENEA - Centro Ricerche Frascati)*;
Formica, Domenico *(Campus Bio-Medico University)*; Schena,
Emiliano *(University of Rome Campus Bio-Medico)*

**14:35-14:50**                                                       SaCT4.2

**Electromagnetic Disturbances Rejection with Single Skin
Contact in the Context of ECG Measurements with
Cooperative Sensors**

Rapin, Michael\* *(Swiss Center for Electronics and
Microtechnology, CSEM)*; Ferrario, Damien *(CSEM)*; Haenni,
Etienne *(CSEM)*; Wacker, Josias *(CSEM)*; Falhi, Abdessamad
*(CSEM)*; Meier, Christophe *(CSEM SA)*; Porchet, Jacques-
André *(CSEM SA)*; Chételat, Olivier *(CSEM)*

**14:50-15:05**                                                    SaCT4.3
**A Pressure-Sensitive Palatograph for Speech Analysis**
Baldoli, Ilaria *(Scuola Superiore Sant'Anna, the BioRobotics Institute)*; Maselli, Martina* *(Scuola Superiore Sant'Anna)*; Manti, Mariangela *(Scuola Superiore Sant'Anna, Pisa, Italy)*; Surace, Elisabetta *(Scuola Superiore Sant'Anna)*; Cianchetti, Matteo *(Scuola Superiore Sant'Anna)*; Laschi, Cecilia *(Scuola Superiore Sant'Anna)*

**15:05-15:20**                                                    SaCT4.4
**Continuous Bladder Volume Monitoring System for Wearable Applications**
Shin, Seung-chul* *(Yonsei University)*; Moon, Junhyung *(Yonsei University)*; Kye, Saewon *(Yonsei University)*; Lee, Kyoungwoo *(Yonsei University)*; Lee, Yong Seung *(Yonsei University)*; Kang, Hong-Goo *(Yonsei University)*

**15:20-15:35**                                                    SaCT4.5
**A Wearable 12-Lead ECG Acquisition System with Fabric Electrodes**
Zhang, Haoshi *(Shenzhen Institutes of Advanced Technology)*; Tian, Lan *(Shenzhen Institutes of Advanced Technology, Chinese Academy of)*; Lu, Huiyang *(School of Data and Computer Science, Sun Yat-sen University)*; Zhou, Ming *(School of Control science and Engineering, Shandong University)*; Zou, Haiqing *(Shenzhen Yingda Strong Technology Co.)*; Fang, Peng* *(Shenzhen Institutes of Advanced Technology, Chinese Academy of S)*; Yao, Fuan *(School of Control Science and Engineering, Shandong University)*; Li, Guanglin *(Shenzhen Institutes of Advanced Technology)*

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**SaCT5:** 14:20-15:50                                             Lee Room
**Physical Sensors and Sensor Systems II** (Oral Session)

**14:20-14:35**                                                    SaCT5.1
**A Wearable Hand Gesture Recognition Device based on Acoustic Measurements at Wrist**
Siddiqui, Nabeel *(City University of Hong Kong)*; Chan, Rosa H. M.* *(City University of Hong Kong)*

**14:35-14:50**                                                    SaCT5.2
**Novel Force-Sensing System for Minimally Invasive Surgical Instruments**
Wee, Justin W.* *(Univ. of Toronto, Hospital for Sick Children, CIGITI)*; Gerstle, J. Ted *(Univ. of Toronto, Hospital for Sick Children, CIGITI)*; Francis, Peter *(Univ. of Toronto)*; Drake, James *(Univ. of Toronto, CIGITI, Hospital for Sick Children)*; Looi, Thomas *(CIGITI, Hospital for Sick Children)*; Brooks, Robert Joseph *(Hostipal for Sick Children, Univ. of Toronto)*; Kang, Matthew *(Univ. of Toronto)*; Azzie, Georges *(The Hospital for Sick Children)*; Masotti, Leigh *(CIGITI, The Hospital for Sick Children)*; Villavicencio, Daniel *(EiE)*

**14:50-15:05**                                                    SaCT5.3
**Office Activity Classification using First-Reflection Ultrasonic Echolocation**
Griffith, Henry* *(Michigan State Univ.)*; Biswas, Subir *(Michigan State Univ.)*; Hajiaghajani, Faezeh *(Michigan State Univ.)*

**15:05-15:20**                                                    SaCT5.4
**A Wearable Ultrasonic Sensor Network for Analysis of Bilateral Gait Symmetry**
Karalikkadan, Ashhar* *(Nanyang Technological University)*; Soh, Cheong Boon *(Nanyang Technological University)*; Kong, Keng He *(Tan Tock Seng Hospital)*

**15:20-15:35**                                                    SaCT5.5
**Monitoring Smoking Behaviour using a Wearable Acoustic Sensor**
Torres, Iñigo *(Imperial College London)*; Imtiaz, Syed Anas *(Imperial College London)*; Peng, Mingxu* *(Imperial College London)*; Rodriguez-Villegas, Esther *(Imperial College London)*

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**SaCT8:** 14:20-15:50                                             Schwan Room
**Brain Functional Imaging II** (Oral Session)

**14:20-14:35**                                                    SaCT8.1
**Propofol-Induced Sedation Diminishes the Strength of Frontal-Parietal-Occipital EEG Network**
Rathee, Dheeraj* *(Ulster University)*; Cecotti, Hubert *(University of Ulster)*; Prasad, Girijesh *(University of Ulster)*

**14:35-14:50**                                                    SaCT8.2
**Single-Trial Detection of Event-Related Fields in MEG from the Presentation of Happy Faces: Results of the Biomag 2016 Data Challenge**
Cecotti, Hubert* *(University of Ulster)*; Barachant, Alexandre *(Independent Researcher)*; King, Jean Remi *(New York University)*; Sanchez Bornot, Jose Migueal *(Ulster University)*; Prasad, Girijesh *(University of Ulster)*

**14:50-15:05**                                                    SaCT8.3
**Emergence of Metastable Dynamics in Functional Brain Organization via Spontaneous fMRI Signal and Whole-Brain Computational Modeling**
Lee, Won Hee* *(Icahn School of Medicine at Mount Sinai)*; Frangou, Sophia *(Icahn School of Medicine at Mount Sinai)*

**15:05-15:20**                                                    SaCT8.4
**Why Build an Integrated EEG-NIRS? About the Advantages of Hybrid Bio-Acquisition Hardware**
von Lühmann, Alexander* *(Machine Learning Dept. and Neurotechnology, Technische Univ)*; Müller, Klaus-Robert *(Berlin Institute of Technology)*

**15:35-15:50**                                                    SaCT8.6
**Sensorimotor Network Parcellation for Pre-Surgical Patients using Low-Pass Filtered fMRI**
Han, Hao *(Tsinghua University)*; Yan, Yuxiang *(Tsinghua University)*; Zhou, WenJing *(Tsinghua University,)*; Hong, Bo* *(Tsinghua University)*

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**SaCT9:** 14:20-15:50                                             Plonsey Room
**Human Performance II** (Oral Session)
**Chair:** Finley, James *(University of Southern California)*

**14:20-14:35**                                                    SaCT9.1
**An Eye Tracking Index for the Salience Estimation in Visual Stimuli**
Babiloni, Fabio* *(University of Rome)*; Cartocci, Giulia *(University of Rome Sapienza)*; Modica, Enrica *(University of Rome Sapienza)*; Maglione, Anton Giulio *(University of Rome Sapienza)*; Di Flumeri, Gianluca *(University of Rome Sapienza)*

**14:50-15:05**                                                    SaCT9.3
**The External Force Associated with Callus Formation under the First Metatarsal Head is Reduced by Wearing Rocker Sole Shoes**
Amemiya, Ayumi* *(Chiba University)*; Okonogi, Rena *(Dept. of Nursing Physiology, Graduate School of Nursing, Ch)*; Yamakawa, Hiroki *(Nature's Walk Ltd)*; Susumu, Kaori *(Dept. of Nursing Physiology, Graduate School of Nursing, Ch)*; Jitsuishi, Tatsuya *(Dept. of Nursing Physiology, Graduate School of Nursing, Ch)*; Sugawara, Hisayoshi *(Graduate School of Nursing, Chiba University)*; L. Tanaka, Yuji *(Dept. of Nursing Physiology, Graduate School of Nursing, Ch)*; Komiyama, Masatoshi *(Dept. of Nursing Physiology, Graduate School of Nursing, Ch)*; Mori, Taketoshi *(The University of Tokyo)*

**15:05-15:20**                                                    SaCT9.4
**Manipulating the Fidelity of Lower Extremity Visual Feedback to Identify Obstacle Negotiation Strategies in Immersive Virtual Reality**
Kim, Aram* *(Univ. of Southern California)*; Zhou, Zixuan *(Univ. of Southern California)*; Kretch, Kari *(Univ. of Southern California)*; Finley, James *(Univ. of Southern California)*

**July 15 Saturday**

**15:20-15:35**　　　　　　　　　　　　　　SaCT9.5

**Prediction of Microsleeps using Pairwise Joint Entropy and Mutual Information between EEG Channels**

Buriro, Abdul Baseer* *(University of Canterbury)*; Jones, Richard D. *(New Zealand Brain Research Institute)*; Weddell, Stephen J. *(University of Canterbury)*

**15:35-15:50**　　　　　　　　　　　　　　SaCT9.6

**Ankle-Foot Orthosis using Elastomer-Embedded Flexible Joint**

Abe, Isao* *(Oita University)*; Ishiya, Kohei *(Oita University)*; Kikuchi, Takehito *(Oita University)*; Tanida, Sousuke *(Bukkyo University)*; Yasuda, Takashi *(Shiga School of Medical Technology)*; Taiki, Oshimoto, Taiki *(Oita University)*

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**SaCT10:　14:20-15:50**　　　　　　　　Schmitt Room
**Health Informatics – Mobile Health I** (Oral Session)
**Chair:** Van Gorp, Pieter *(Eindhoven University of Technology)*

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**14:20-14:35**　　　　　　　　　　　　　　SaCT10.1

**A Modified D-Max Method to Estimate Heart Rate at a Ventilatory Threshold during an Incremental Exercise Test**

Jang, Dae-Geun* *(Samsung Advanced Institute of Technology)*; Ko, Byung-Hoon *(Samsung Advanced Institute of Technology)*; Sunoo, Sub *(Kyung Hee University)*; Nam, Sang-Seok *(KyungHee Univ.)*; Park, Hun-Young *(Kyunghee University)*; Bae, Sang Kon *(Samsung Advanced Inst of Tech)*

**14:35-14:50**　　　　　　　　　　　　　　SaCT10.2

**Unified Health Gamification can Significantly Improve Well-Being in Corporate Environments**

Shahrestani, Arash *(Eindhoven Univ. of Technology)*; Van Gorp, Pieter* *(Eindhoven Univ. of Technology)*; Le Blanc, Pascale *(Eindhoven Univ. of Technology)*; Greidanus, Fabrizio *(ZuidZorg)*; de Groot, Kristel *(GGzE)*; Leermakers, Jelle *(Finaps)*

**14:50-15:05**　　　　　　　　　　　　　　SaCT10.3

**Automatic Diagnosis of Tuberculosis Disease based on Plasmonic ELISA and Color-Based Image Classification**

AbuHassan, Kamal* *(Anglia Ruskin University (Chelmsford Campus))*; Bakhori, Noremylia M. *(Universiti Putra Malaysia)*; Kusnin, Norzila *(Universiti Putra Malaysia)*; Azmi, Umi Zulaikha Mohd *(Universiti Putra Malaysia)*; Hoque Tania, Marzia *(Anglia Ruskin University)*; Evans, Benjamin *(University of East Anglia)*; Binti Yusof, Nor Azah *(Universiti Putra Malaysia)*; Hossain, M Alamgir *(Anglia Ruskin University)*

**15:05-15:20**　　　　　　　　　　　　　　SaCT10.4

**Novel Features from Autocorrelation and Spectrum to Classify Phonocardiogram Quality**

Das, Deepan* *(TATA Consultancy Svcs.)*; Banerjee, Rohan *(Tata Consultancy Svcs. Ltd.)*; Dutta Choudhury, Anirban *(Tata Consultancy Svcs. Ltd.)*; Bhattacharya, Sakyajit *(TCS Innovation Labs)*; Deshpande, Parijat *(TCS)*; Pal, Arpan *(Tata Consultancy Svcs.)*; Mandana, K M *(Fortis Hospitals, Kolkata)*

**15:20-15:35**　　　　　　　　　　　　　　SaCT10.5

**Detection of Chewing Motion in the Elderly using a Glasses Mounted Accelerometer in a Real-Life Environment**

Mertes, Gert* *(KU Leuven)*; Hallez, Hans *(KU Leuven)*; Vanrumste, Bart *(Katholieke Universiteit Leuven)*; Croonenborghs, Tom *(KU Leuven Campus Geel, AdvISe Technology Lab, Belgium)*

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**SaCT11:　14:20-15:50**　　　　　　Greatbatch Room
**TRPM Channels by Multi-Hierarchical Analysis: Measurement and Modeling** (Minisymposium)
**Chair:** Inoue, Ryuji *(Fukuoka University School of Medicine)*

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**14:20-14:35**　　　　　　　　　　　　　　SaCT11.1

**An Energy Efficient Parallelization for Computer Simulation of Electrocardiogram based on TK1 Board**

Qiu, Feng *(Shanghai University)*; Shen, Wenfeng *(Shanghai University)*; Zhu, Xin* *(The University of Aizu)*; Hu, Yaopeng *(Fukuoka University)*; Inoue, Ryuji *(Fukuoka University School of Medicine)*; Shen, Yanghua *(Shanghai University)*

**14:35-14:50**　　　　　　　　　　　　　　SaCT11.2

**Numerical Model-Based Investigation on the Role of Transient Receptor Potential Melastatin Subfamily Member 4 (TRPM4) Channel in Cardiac Arrhythmogenicity**

Hu, Yaopeng *(Fukuoka University)*; Hiraishi, Keizo *(Dept. of Physiology, School of Medicine, Fukuoka University)*; Kurahara, Lin-Hai *(Fukuoka University)*; Ichikawa, Jun *(Fukuoka University School of Medicine)*; Numata, Tomohiro *(Fukuoka University)*; Zhu, Xin *(The University of Aizu)*; Inoue, Ryuji* *(Fukuoka University School of Medicine)*

**14:50-15:05**　　　　　　　　　　　　　　SaCT11.3

**Study on a 2D Cardiac Model Incorporating a TRPM4 Ion Channel**

Shen, Yanghua *(Shanghai University)*; Shen, Wenfeng *(Shanghai University)*; Zhu, Xin* *(The University of Aizu)*; Hu, Yaopeng *(Fukuoka University)*; Inoue, Ryuji *(Fukuoka University School of Medicine)*; Qiu, Feng *(Shanghai University)*

**15:05-15:20**　　　　　　　　　　　　　　SaCT11.4

**Enhanced TRPM7 Activity Promotes Endothelial Remodeling in Pulmonary Arterial Hypertension**

Kurahara, Lin-Hai* *(Fukuoka University)*; Hiraishi, Keizo *(Dept. of Physiology, School of Medicine, Fukuoka University)*; Hu, Yaopeng *(Fukuoka University)*; Inoue, Ryuji *(Fukuoka University School of Medicine)*

**15:20-15:35**　　　　　　　　　　　　　　SaCT11.5

**Modeling and Simulation of PI-Signal Regulated TRPC Channels**

Mori, Masayuki* *(Kyoto University)*; Inoue, Ryuji *(Fukuoka University School of Medicine)*

**15:35-15:50**　　　　　　　　　　　　　　SaCT11.6

**Involvement of Redox-Sensitive TRPM2 Channel in Cardiac Dysfunction Induced by Ischemia-Reperfusion Injury**

Numata, Tomohiro* *(Fukuoka University)*; Inoue, Ryuji *(Fukuoka University School of Medicine)*

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**SaCT12:　14:20-15:50**　　　　　　　　Geddes Room
**Ablation Technologies** (Oral Session)
**Chair:** Prakash, Punit *(Kansas State University)*

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**14:20-14:35**　　　　　　　　　　　　　　SaCT12.1

**Development of Evaluation Methods for the Approval and Review of Intense Pulsed Light (IPL)**

Lee, Seung-Youl* *(Ministry of Food and Drug Safety)*; Ju, Cho-Long *(Ministry of Food and Drug Safety)*; Lee, Tae-Hee *(Ministry of Food and Drug Safety)*; Na, Hyeon-su *(Ministry of Food and Drug Safety)*; Lee, In-Su *(Ministry of Food and Drug Safety)*; Park, Chang Won *(National Institute of Food and Drug Safety Evaluation, Ministry)*

**14:35-14:50**　　　　　　　　　　　　　　SaCT12.2

**Tapered Fiber Optic Applicator for Laser Ablation: Theoretical and Experimental Assessment of Thermal Effects on Ex Vivo Model**

Saccomandi, Paola* *(Univ. Campus Bio-Medico of Rome)*; Di Matteo, Francesco Maria *(Univ. Campus Bio-Medico of Rome)*; Schena, Emiliano *(Univ. of Rome Campus Bio-Medico)*; Quero, Giuseppe *(IHU-Strasbourg)*; Massaroni, Carlo *(Università Campus Bio-Medico di Roma)*; Giurazza, Francesco *(Università Campus Bio-Medico di Roma)*; Costamagna, Guido *(Unit of Digestive Endoscopy, Università Cattolica del Sacro Cuor)*; Silvestri, Sergio *(Università Campus Bio-Medico di Roma)*

**14:50-15:05**　　　　　　　　　　　　　　SaCT12.3

**Effects of Nd:YAG Laser for the Controlled and Localized Treatment of Early Gastrointestinal Tumors: Preliminary in Vivo Study**

Saccomandi, Paola* *(University Campus Bio-Medico of Rome)*; Quero, Giuseppe *(IHU-Strasbourg)*; Costamagna, Guido *(Unit of Digestive Endoscopy, Università Cattolica del Sacro Cuor)*; Diana, Michele *(IRCAD: Research Institute against Cancer of Digestive System, St)*; Marescaux, Jacques *(IRCAD)*

**15:05-15:20**  SaCT12.4
**Surface Modifications of Human Tooth using Nd: YAG Laser for Dental Applications**
Mohamad Suhaimi, Fatanah* *(Advanced Medical and Dental Institute, University Sains Malaysia)*; Zainol Alam, Nurzarifha *(University Sains Malaysia)*; Mat Ariffin, Suriani *(University Sains Malaysia)*; Abd Razak, Nurul Atiqah *(Advanced Medical and Dental Institute, University Sains Malaysia)*; Abdul Razab, Mohammad Khairul Azhar *(University Malaysia Kelantan)*

**15:20-15:35**  SaCT12.5
**A Novel Sensor for Measuring Temperature Profile during the Thermoablation**
Bujnowski, Adam *(Gdansk University of Technology)*; Wtorek, Jerzy* *(Gdansk University of Technology)*

**15:35-15:50**  SaCT12.6
**Preliminary Study on Low Intensity Focused Ultrasound System for Neuromodulation**
Lee, Ju Hyung *(Yonsei Univ.)*; Hong, Hyun Ki *(Catholic Kwandong Univ. International St. Mary's Hospital)*; Song, Byeong-Wook *(EIT/LOFUS R&D Center, Institute for Integrative Medicine, Cathol)*; Jung, Yu jin *(EIT/LOFUS R&D Center, Institute for Integrative Medicine, Colleg)*; Na, YoungCheol *(Catholic Kwandong Univ. Internationa St Mary's Hospital)*; Kim, Nam Hyun *(Yonsei Univ.)*; Kim, Bong-Soo* *(Catholic Kwandong Univ.)*

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**SaCT13:** 14:20-15:50  Dunn Room
**Sensor Informatics – Physiological Monitoring I** (Oral Session)
**Chair:** Baranoski, Gladimir Valerio Guimaraes *(Univ. of Waterloo)*

**14:20-14:35**  SaCT13.1
**Differential Effects of Physical and Psychological Stressors on Electrodermal Activity**
A S, Anusha* *(IITM)*; J., Jose *(HTIC)*; Sp, Preejith *(Healthcare Technology Innovation Center - IITMadras)*; Joseph, Jayaraj *(HTIC, Indian Institute of Technology Madras)*; Sivaprakasam, Mohanasankar *(Indian Institute of Technology Madras)*

**14:35-14:50**  SaCT13.2
**An Autonomous Medical Monitoring System: Validation on Arrhythmia Detection**
Lemkaddem, Alia* *(CSEM)*; Proença, Martin *(Swiss Center for Electronics and Microtechnology (CSEM))*; Delgado-Gonzalo, Ricard *(CSEM)*; Renevey, Philippe *(CSEM)*; Oei, Ing *(Airbus Defence and Space GmbH)*; Montano, Giuseppe *(Airbus Defence and Space Limited)*; Martinez-Heras, Jose Antonio *(European Space Operations Centre (ESOC))*; Donati, Alessandro *(European Space Operations Centre (ESOC))*; Bertschi, Mattia *(CSEM)*; Lemay, Mathieu *(CSEM)*

**14:50-15:05**  SaCT13.3
**Virtual Proprioception for Eccentric Training**
LeMoyne, Robert* *(Northern Arizona University)*; Mastroianni, Timothy *(Independent)*

**15:05-15:20**  SaCT13.4
**Motion-Oriented Noisy Physiological Signal Refining using Embedded Sensing Platforms**
Park, JaeYeon *(Ajou Univ.)*; Nam, Woojin *(Ajou Univ.)*; Kim, Tae Young *(Ajou Univ. School of Medicine)*; Lee, Sukhoon *(Ajou Univ. School of Medicine)*; Yoon, Dukyong *(Ajou Univ. School of Medicine)*; Ko, JeongGil* *(Ajou Univ.)*

**15:20-15:35**  SaCT13.5
**Detection of Generalized Tonic-Clonic Seizures using Short Length Accelerometry Signal**
Kusmakar, Shitanshu* *(The Univ. of Melbourne)*; Karmakar, Chandan *(Deakin Univ.)*; Yan, Bernard *(The Royal Melbourne Hospital)*; O'Brien, Terence *(The Royal Melbourne Hospital)*; Muthuganapathy, Ramanathan *(Indian Institute of Technology Madras)*; Palaniswami, Marimuthu *(The Univ. of Melbourne)*

**15:35-15:50**  SaCT13.6
**Three-Wavelength Method for the Optical Differentiation of Methemoglobin and Sulfhemoglobin in Oxygenated Blood**
Van Leeuwen, Spencer Richard* *(University of Waterloo)*; Baranoski, Gladimir Valerio Guimaraes *(University of Waterloo)*; Kimmel, Bradley William *(University of Waterloo)*

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**SaCT18:** 14:20-15:50  Montgomery Hall
**Time-Frequency and Time-Scale Analysis – Acoustic Signals** (Oral Session)
**Chair:** Datta, Shreyasi *(Tata Consultancy Services)*

**14:20-14:35**  SaCT18.1
**Feature Extraction Techniques for Low-Power Ambulatory Wheeze Detection Wearables**
Acharya, Jyotibdha* *(Nanyang Technological University)*; Basu, Arindam *(Nanyang Technological University)*; Ser, Wee *(Nanyang Technological University)*

**14:35-14:50**  SaCT18.2
**Cough Sound Analysis for Diagnosing Croup in Pediatric Patients using Biologically Inspired Features**
Sharan, Roneel V* *(University of Queensland)*; Abeyratne, Udantha R *(University of Queensland)*; Swarnkar, Vinayak *(University of Queensland)*

**14:50-15:05**  SaCT18.3
**A Robust Dataset-Agnostic Heart Disease Classifier from Phonocardiogram**
Banerjee, Rohan *(Tata Consultancy Services Ltd.)*; Dutta Choudhury, Anirban* *(Tata Consultancy Services Ltd.)*; Deshpande, Parijat *(TCS)*; Bhattacharya, Sakyajit *(TCS Innovation Labs)*; Pal, Arpan *(Tata Consultancy Services)*; Mandana, K M *(Fortis Hospitals, Kolkata)*

**15:05-15:20**  SaCT18.4
**Identification of Chronic Heart Failure using Linear and Nonlinear Analysis of Heart Sound**
Zheng, Yineng *(Chongqing University)*; Guo, Xingming* *(Chongqing University)*

**15:20-15:35**  SaCT18.5
**Evaluating the use of Neural Networks and Acoustic Measurements to Identify Laryngeal Pathologies**
Sodré, Bruno *(UTFPR)*; Rosa, Marcelo* *(Universidade Tecnológica Federal do Paraná)*; Dassie-Leite, Ana Paula *(Universidade Estadual do Centro-Oeste - UNICENTRO)*

**15:35-15:50**  SaCT18.6
**Automated Lung Sound Analysis for Detecting Pulmonary Abnormalities**
Datta, Shreyasi* *(Tata Consultancy Services)*; Dutta Choudhury, Anirban *(Tata Consultancy Services Ltd.)*; Deshpande, Parijat *(TCS)*; Bhattacharya, Sakyajit *(TCS Innovation Labs)*; Pal, Arpan *(Tata Consultancy Services)*

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