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기타소속:

강연제목: Bi-directional Bioelectronics

Abstract:

In the current aging society, the number of patients suffering from degenerative brain diseases is continuously increasing. However, many of these brain disorders are intractable and difficult to treat. Non-invasive brain stimulation is an attractive alternative method to a pharmaceutical approach that attempts to treat brain disorders through physical stimulation. Among the various direct brain stimulation techniques, such as electrical, magnetic, andoptical, ultrasound has been proposed as a new modality for neuromodulation due to its distinct advantages such as high spatial resolution and in-depth targeting. As ultrasound modality is still in the early stages of development, further investigations on various aspects such as neuromodulation mechanism, therapeutic effects, and safety are still required. Although ultrasound technology is a mature biomedical tool developed from ultrasound imaging, many new technological advancements such as miniaturized devices based on microelectromechanical systems (MEMS) technology have been recently introduced for the specific purpose of neuromodulation. In this talk, I will introduce these new neurotools which are essential to uncovering the fundamental mechanisms of ultrasound brain stimulation and ultimately to developing an effective therapeutic means for brain disorders.

Brief Biosketch

Hyunjoo Jenny Lee is an Associate Professor in the School of Electrical Engineering and the KAIST Endowed Chair Professor at the Korea Advanced Institute of Science and Technology (KAIST). She received the B.S. degree and M.Eng. degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (MIT), Cambridge, MA, in 2004 and 2005, respectively, and the Ph.D. degree in Electrical Engineering from Stanford University, Stanford, CA, in 2012. Her research focuses on MEMS sensors and actuators for biomedical applications including neural interfaces, ultrasound transducers, epidermal electronics, and biosensors. She is the author of over 50 journal and conference papers and is a recipient of a number of awards, including the Korean Government's Minister of Science and ICT Award (2022), S-Oil Next-Generation Scientist Awards (2022), KAIST Technology Innovation Award (2021), and WEF Young Scientist Award (2017).