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**강연제목: 개인 뇌파를 이용한 인공두뇌모델 구축 및 뇌-기계 인터페이스 응용/  
Construction of Artificial Brain Models Using Individual EEG Data and Brain-Computer  
Interface Application**

**Abstract:**

The advancement of smart devices and virtual/augmented reality technologies has led to research into new types of biometric signal interfaces. Among these, electroencephalogram (EEG) brain-computer interfaces (BCIs), which record EEG signals generated during thinking to decode intentions, emotions, and commands, are expected to become very important in the future. To properly develop BCIs, it's crucial to have a deep understanding of the brain's functions and design EEG decoders based on this knowledge. However, due to the complexity, non-linearity, and individual differences in EEG signals, along with our limited understanding of brain functions, this area of research presents significant challenges. As a result, most current research focuses on collecting large amounts of EEG data and using machine learning techniques to decode it. While these data-driven methods have been successful in interpreting some brain functions, they struggle in areas with limited data. Additionally, the variation in EEG patterns from person to person makes it difficult to create precise BCIs using data from many individuals. To address these challenges, this lecture will introduce research on brain-computer interfaces that use artificial brain models to simulate brain functions using an individual's EEG data. Specifically, it will explain how spiking neural networks can be used to build artificial brain models that mimic real neuron activity. This approach allows for the simulation of individual brain activities necessary for replicating specific brain functions. It will also discuss how these artificial brain models can be applied in Movement and Neuro-talk BCIs.

**Brief Biosketch**

- Assistant Professor, Pukyong National University, Republic of Korea, 2022.09.01. – present.
- Scientific Advisor, 4N Inc., Republic of Korea, 2021.03.01. – present.
- Assistant Professor, Kangnam University, Republic of Korea, 2021.03.01. – 2022.08.31
- CTO, 4N Inc., Republic of Korea, 2020.09.01. – 2021.02.28.
- Research Area: Brain-inspired AI (Artificial Brain Models / Spiking Neural Networks)
- Application: Brain-computer Interface / Prediction of Nonlinear System