2024년도 대한전자공학회

# 하계종합학술대회 초청강연 발표정보

## ▌발표자 정보

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| **약력** | 학력 2011. Ph.D. (Physics) KAIST<br>2004. B.S. (Physics) KAIST<br>경력 2018-current Senior Researcher @ Brain Science Institute, KIST<br>2011-2018 Post-doctoral researcher @ Brain Science Institute, KIST<br>연구분야 Cerebellar physiology and information processing,<br>Computational modeling of multi-scale neural components,<br>Theoretical approaches to biological neural networks<br>주요연구 * 소뇌 시냅스 가소성(2013-2017), 뉴런의 활동성(2015-2021), 내부 연결 특성 (2016-2023), 뉴럴 모델링(2013-현재) 등에 대한 논문 발표<br>* 계산신경과학을 통한 소뇌 뉴로모픽 칩 개발 과제 참여<br>* 노화 및 뇌질환 모델링 진행 중 (파킨슨병 in silico model 구축 과제 참여, 해마-전두엽 기억 네트워크의 노화 및 치매에 따른 변화 과제 참여 등) | | |

## ▌초청강연 정보

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| **제 목** | A synergistic future for neuroscience and neuromorphic computing<br>: Feasible way to construct the digital twin brain and its application |
| **Abstract** | The handiest and intuitive way to prove if a given biological neural network(BNN) generates suspected functions is to build an artificial duplicate capturing essential properties of components. The term, ‘digital twin brain,’(DTB) refers to such a copy demonstrating similar function of the real brain. While the bottom-up approach to building artificial neural networks (ANNs) to meet performance standards has been criticized for being unrealistic and unfeasible, neuroscientists have been working on developing DTB to be used as a platform for testing candidate clinical intervention protocols or for introducing suspected brain disease lesions. The development of DTB demands a significant amount of computing power, but this can be mitigated by |

neuromorphic hardware that closely resembles biological neural components. This is because the accuracy of the predictions made by DTB directly depends on how closely it resembles BNN in detail. Considering the fact that the field of neuromorphic computing actively seeks perfectly fitting applications, DTB would be the common area where neuroscience and neuromorphic computing collaborate synergistically by improving our understanding of the brain and brain disease and by successfully utilizing neuromorphic computing to the biomedical aim. This talk will explain DTB and cover its construction and application, as well as any potential influences that neuromorphic computing may have on DTB.