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Edition IV

Arindam Basu

Professor,
Department of Electrical Engineering,
City University of Hong Kong

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Neuromorphic technologies for Brain-Machine Interfaces

Abstract: Neuromorphic electronics take inspiration from the brain to develop circuits and systems with similar energy and area efficiencies. While they have become very popular for different edge AI applications, these technologies have major benefits for biomedical applications with a natural fit to brain-machine interfaces (BMI). In this talk, I will outline some of our group's work in developing neuromorphic intention decoder integrated circuits with very low energy/area footprint suitable for implantation. I will also show decoding algorithms designed jointly with the hardware inspired by neuronal population coding which can be trained rapidly to adapt to the non-stationary nature of the acquired signals. Lastly, I will talk about some future directions such as integration with sensory feedback from neuromorphic e-skin and self-adapting decoders.

Brief Bio: *Arindam Basu received the B.Tech. and M.Tech. degrees in ECE from the I.I.T, Kharagpur, India, and the M.S. degree in Mathematics and the Ph.D. degree in ECE from the Georgia Institute of Technology, Atlanta, GA, USA. He is currently a Professor with the Department of EE, City University of Hong Kong and was a tenured faculty at NTU, Singapore previously.*

Dr. Basu was included in Georgia Tech Alumni Association's 40 under 40 list in 2021 and was awarded the MIT Technology Review's TR35 Asia Pacific Award in 2012. He also received the Prime Minister of India Gold Medal from I.I.T Kharagpur in 2005. He and his students have received several best paper awards and nominations in IEEE conferences.

He has served as IEEE CAS Distinguished Lecturer from 2016 to 2017 and currently serves IEEE in various roles such as TC Chair, Associate editor of journals etc.