

**Intelligent Brain-Machine Interfacing
Microsystems**

Xilin Liu

University of Toronto

Location: EEB 132 & Zoom

2:00 pm – 3:30 pm, Friday, Sept. 3rd, 2021

Meeting ID: 947 0191 2463 Passcode:138956

<https://usc.zoom.us/j/94701912463?pwd=eW1KVmhuODFHdHpMemhQbTllMEZ6Zz09>

Abstract: Communicating with brains directly is among the most thrilling technological advancements in our era. Recent brain-machine interface (BMI) researches have made substantial progress on acquiring and decoding neural signals. However, sending signals back to brains, e.g., encoding and modulating neural activities, remains a significant challenge. This talk discusses how this challenge can be addressed by intelligent BMI microsystems. Specifically, I will present innovative mixed-signal integrated circuits (IC) and system design with edge machine learning for sensory encoding and therapeutic intervention of neurological disorders. Novel pre-clinical experiments in freely behaving animals enabled by the BMI microsystems will be discussed. This technology holds great promise in improving millions of patients' quality of life. The research outcomes have broader impacts on digital healthcare and artificial intelligence of things (AIoT). I will conclude this talk with my vision and future research plans to continue advancing the frontiers of BMI technologies.

Biography: Xilin Liu is currently an Assistant Professor at the University of Toronto, Canada. He received his Ph.D. from the University of Pennsylvania, USA, in 2017. Before joining the University of Toronto, he held industrial positions at Qualcomm, USA. His research interests include mixed-signal IC and system design with edge machine learning, especially for brain-machine interfaces. He has co-authored two books along with publications on Nature Electronics, PNAS, and top-tier IEEE transactions. His first-author papers have received three Best Paper Awards at renowned international conferences. He also received the Solid-State Circuits Society (SSCS) Predoctoral Achievement Award in 2016. His industrial experience includes contributions to premium IC products including the world's first commercial 5G chipset.



Faculty Hosts: Mike Chen, Hossein Hashemi, Manuel Monge, Constantine Sideris

Student Organizer & Host: Qiaochu Zhang (qiaochuz@usc.edu)