Seminar

Electro-Acousto-Optic Neural Interfaces: from Physical Implants to Virtual Implants

Dr. Maysam Chamanzar

April 25, 2017 | **12:00 - 1:30pm** | **Scott Hall 6142**

Seminar abstract

The development of next generation neural interfaces will enable us to understand the neural basis of brain function to mitigate central nervous system disorders and also design advanced brain-machine interfaces (BMIs).

In this talk, I will introduce the needs and opportunities to make next generation neural interfaces. I will discuss ongoing research in my lab on developing implantable optrodes (optical-electrical probes) for neural recording and stimulation. We have developed and optimized a fabrication process to realize neural probes in a polymer platform. Our probes have greater than ten times the density and are two orders of magnitude more compliant than the state of the art, exerting minimal tissue damage and tethering forces while still providing volume cortical sampling. I will introduce a novel parylene photonics platform that can be monolithically integrated with our probes for high-resolution optogenetic stimulation.

I will also discuss a novel complementary approach to guide and steer light in the brain for targeted optogenetic stimulation. In this approach, non-invasive ultrasound will define and guide the trajectory of light without physically implanting waveguides or light sources.

The DSN-I Seminar Series is hosted by the Device Science and Nanofabrication Initiative. DSN-I Seminars target researchers in micro and nanofabrication technologies or devices, with the goal of strengthening the user community of the new Scott Hall nanofabrication facility and other shared infrastructure.

Speaker bio

Maysam Chamanzar is an assistant professor of ECE at Carnegie Mellon University. He is a faculty member of the BrainHub at CMU and also the Center for the Neural Basis of Cognition (CNBC), which is a joint venture of University of Pittsburgh and CMU. He was a research scientist at UC Berkeley before joining CMU. Maysam received his Ph.D. in Electrical and Computer Engineering from Georgia Tech in 2012. His dissertation on developing novel hybrid plasmonic-photonic on-chip biosensors received the Sigma Xi best Ph.D. thesis award.

Maysam has published more than 25 peer-reviewed journal and conference papers and he holds three pending patents. He is the recipient of a number of awards including the SPIE research excellence award and GTRIC innovation award.

His current research is focused on developing novel electro-acousto-optic neural interfaces for high-resolution electrophysiology recording and optogenetic stimulation.

Seminar notes: Lunch will be served.