

University of Houston - Biomedical Engineering Seminar

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Via Zoom: <https://uh-edu-cougarnet.zoom.us/j/93512038041>

Label-free Brain Imaging and Mapping with a Serial Optical Coherence Scanner



Taner Akkin, Ph.D.

Abstract

Serial optical coherence scanner provides intrinsic optical contrasts for large-scale brain imaging and mapping at microscopic resolution. It distinguishes white matter and gray matter, and visualizes exquisite networks of axon fiber tracts. This is achieved by using the polarization contrasts highlighting the myelinated fibers and their alignment, and the conventional reflectivity contrast that is available for studying the gray matter. The scanner is a tool for basic and applied research into the structural and connectional architecture of the brain. In addition to imaging applications on brain diseases and conditions, the connectivity maps and principles this technology identifies have potential to guide neuromodulation treatments. If time permits, Dr. Akkin will present a summary of another study that is on optical imaging of neural action potentials.

Biosketch

Taner Akkin is an associate professor in the Department of Biomedical Engineering at the University of Minnesota. He received BSc (1995) and MSc (1997) degrees in Electrical and Electronics Engineering from Çukurova University, Turkey, and a PhD degree (2003) from The University of Texas at Austin, where he started working on biomedical optics and imaging. He conducted research as a postdoc and instructor at Harvard Medical School/Wellman Center for Photomedicine, Massachusetts General Hospital, before moving to Minnesota in 2005. Dr. Akkin's laboratory develops label-free optical imaging techniques, such as polarization-sensitive and phase-sensitive optical coherence tomography, to study neural structure and function. They are particularly interested in imaging and mapping the brain, and detecting the neural activity. Dr. Akkin is an associate editor of Neurophotonics.