

March 25th (Friday)

11:30am – 1:00 pm

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Functional Optical Imaging: A New Frontier Beckons

Abstract

Over the last three decades, investigating brain function in animal models via optical imaging techniques, i.e., functional optical imaging, has enabled scientists to understand healthy brain function and characterize its disruption during disease states. However, traditional optical imaging instrument are bulky, assembled atop a bench (i.e., benchtop-based), and generally require the animal to be anesthetized. These restrictions compromise experimental flexibility and limit the imaging duration to only a few hours potentially causing disease progression to be under-sampled. Moreover, anesthesia could alter the brain function under investigation. Miniaturized optical imaging systems are an emerging and fast evolving field initiated with the goal of addressing these drawbacks. The aim of this talk is to summarize the state of the art and potential of miniaturized functional optical imaging tools in the preclinical research space. To do so, I will first describe the basics of several optical imaging techniques and briefly sketch a historical timeline of how instrumentation was developed. I will then discuss the state of the art and elaborate on an array of exciting future possibilities.

About the Speaker

Janaka Senarathna specializes in designing miniaturized optical imaging systems to investigate brain function in preclinical animal models. He received his BSc in Electronics and Telecommunications Engineering from the University of Moratuwa, Sri Lanka in 2008, and in 2011 and 2017 completed his MSE and PhD in Biomedical Engineering from the Johns Hopkins University. Since then, he has been a postdoctoral fellow affiliated with the Kavli Neuroscience Discovery Institute and the Department of Radiology and Radiological Science at the Johns Hopkins University School of Medicine. Dr. Senarathna currently heads the neuroengineering and bioinstrumentation team in Dr. Arvind Pathak's lab and is using his miniaturized imaging systems to interrogate brain function and its disruption in a range of disease models from brain tumors, seizures to cardiac arrest. He is also in the process of commercializing his imaging tools so that they can be made available to the broader scientific community.