



The Chinese University of Hong Kong

Department of Biomedical Engineering



Time: 3:00 – 4:30 pm, 25 April 2019 (Thursday)

Venue: Room 702, William M.W. Mong Engineering Building

## Quantitative Ultrahigh-resolution Endoscopic Optical Coherence Tomography for Assessing Tissue Histology *in vivo*



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### **Abstract**

Endoscopic OCT (EOCT) affords *in vivo* high-resolution three-dimensional (3D) microanatomies imaging of internal luminal organs. It has been demonstrated for a wide range of clinical applications, such as disease diagnosis and screening where traditional biopsy suffers from sampling error or risk of complications. Integrating innovations in instrumentation and image processing, ultrahigh-resolution EOCT developed in our laboratory—for the first time—achieves a resolving power approaching that of standard histopathology and enables real-time quantification of tissue's microstructure/optical properties at the microscopic level. This technology has opened exciting new opportunities in GI, pulmonary and brain research for addressing unmet clinical needs in early disease detection, guidance of surgical intervention and monitoring of treatment outcome. Here, I will present our recent progress on pushing the technology envelope of ultrahigh-resolution EOCT, showcase a few representative applications including pre-cancer detection, small airway pathophysiology assessment and intra-operative guidance for neurosurgery, and discuss the ongoing development of this technology with machining learning-based image interpretation and quantification.

### **Biography**

Dr. Wu Yuan received his PhD degree in Electronic Engineering from the Chinese University of Hong Kong in 2008. He is currently a research associate at the Department of Biomedical Engineering, Johns Hopkins University, with a joint appointment to the Department of Neurologic Surgery, Mayo Clinic. He has pioneered several innovative bio-photonics imaging probes/devices to enable translational applications of high-resolution optical endomicroscopy imaging, such as portable ultrahigh-resolution endoscopic OCT system, ultracompact OCT microprobe, multifunctional deep-brain microneedle and 3D volumetric airway balloon imaging technology etc. To date, he has published 39 peer-reviewed articles, with a total citation >1,800 and an H-index~24 (according to Google Scholar). He has been honored with the Global Scholarship for Research Excellence-CNOOC (2008), Otto Moensted Travel Award (2011) and Alfred Blalock Award (2019). He currently serves on the editorial board of several international journals in the area of bioengineering and medicine.

**\*\*\* ALL ARE WELCOME \*\*\***

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