



**The Chinese University of Hong Kong
Department of Biomedical Engineering**

**Cellular-resolution 3D Structural and Functional Imaging
of the Living Human Eye**



Dr. Yan LIU

Research Associate
School of Optometry
Indiana University

Date: 13 January 2026 (Tue)

Time: 2:30 – 3:30 pm

Venue: ERB1122 (William M.W. Mong Engineering Building, CUHK)

Abstract

Aging societies such as Hong Kong face a growing burden of age-related eye diseases, including glaucoma, which significantly reduce quality of life and impose a heavy burden on families and society. Early detection is essential to preserve vision, enable timely treatment, and reduce both personal suffering and societal costs. Because diseases originate at the cellular and molecular levels long before they become detectable with clinical imaging, early detection and precise monitoring require technologies capable of visualizing the 3D microscopic structures of the living human eye. Dr. LIU's Adaptive Optics Optical Coherence Tomography is the only technology that enables 3D structural and functional imaging of the living human eye at the cellular level. This technology has the potential to transform ophthalmology by advancing our understanding of disease pathophysiology, enabling early diagnosis of blinding diseases, and improving treatment monitoring to accelerate clinical trials. These advancements will expedite the development of effective therapies, ultimately improving patient care. He will describe how he and his teammates advance this technology to address clinical needs and apply it to reveal retinal structures that were previously observable only ex vivo through histology.

Biography

Dr. Yan LIU is a Research Associate at the Indiana University School of Optometry, where his research focuses on developing high-resolution imaging technologies to study the human eye in vivo at the cellular level. He completed his postdoctoral training with Prof. Changhui YANG in the Department of Electrical Engineering at the California Institute of Technology (Caltech). Dr. LIU earned his Ph.D. in Biomedical Engineering at Washington University under the mentorship of Prof. Lihong V. WANG, now Professor of Medical Engineering and Electrical Engineering at Caltech. Dr. LIU received his Bachelor's degree from Tsinghua University, where he studied Physics and Optical Engineering. To date, he has authored 41 peer-reviewed journal articles, including 16 first-author or corresponding-author publications in leading journals such as Nature Photonics, Nature Communications (×2), and Optica (×3). According to Google Scholar, his publications have received 2,607 citations, with an h-index of 25. For more information, please visit his website (<https://yan-liu.wixsite.com/mysite>).

**** ALL ARE WELCOME ****

For enquiries, please contact Ms. Kitty CHUNG (BME) at 3943-8261.