

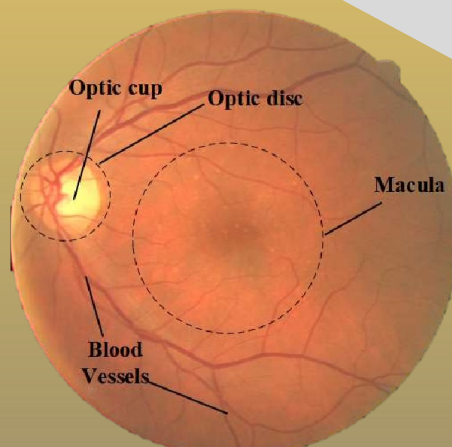
**Joint IEEE Bombay
Section Photonics
Society and Special ASET
Colloquium**



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Homi Bhabha Auditorium, TIFR Mumbai
YouTube Live Link: <https://tinyurl.com/ASETon5Oct>

**Deep learning empowered
optical coherence
tomography**

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Optical coherence tomography (OCT) has now become a standard of care, impacting the treatment of millions of people every year. There is tremendous clinical and preclinical OCT progress in diagnosing cancers and disorders in ophthalmology, cardiology, neurology, dermatology, gastroenterology, etc. In this talk, deep learning algorithms for detecting/segmenting the crucial cell/tissue/lesion features, such as nuclei, the dermal-epidermal junction of human skin, and tumor boundaries, will be addressed. The performance can be explained by visualizing the neural network's feature activations in response to the cell-like structure of human tissues. Histopathological stained images are considered the gold standard for clinical cancer diagnosis. However, the staining processing time is long, especially when surgery progresses. There is an unmet need to build an image translation model to convert the grey-level OCT images to mimic the stained images. Both semi-supervised and unsupervised approaches toward virtue histopathology will be addressed. Leveraging the ever-escalating techniques in applying deep learning algorithms to medical image analysis could accelerate the acceptance of deep learning applications among clinicians and patients.

Dr. Sheng-Lung Huang received his Ph.D. from the Department of Electrical Engineering, University of Maryland, College Park, in 1993. He is a Distinguished Professor at the Graduate Institute of Photonics and Optoelectronics (GIPO) and the Department of Electrical Engineering at National Taiwan University. He served as the Chairman of GIPO from 2007 to 2010. He was also a guest professor at the Abbe School of Photonics, Friedrich-Schiller University of Jena, Germany, in 2014. Dr. Huang is a Fellow of the Optica. He pioneers the development of cellular-resolution optical coherence tomography and has used it clinically in the early-stage diagnosis of cancers and diseases. In 2014, he co-founded Apollo Medical Optics and was the Chief Technology Officer. Dr. Huang served as Chairman of IEEE/LEOS (now IEEE/PS) Taipei Chapter from 2005 to 2006. He was a steering board member of the European Master of Science in Photonics (EMSP). Dr. Huang served as an Associate Editor of the IEEE Photonics Journal and was a Topical Editor, Optics Letters, 2005–2011. Dr. Huang has received the Outstanding Research Award from the Ministry of Science and Technology and the University/Industry Cooperation Award from the Ministry of Education, Taiwan. He has also received Chimei Innovation Excellence Award and Optical Communications Elite Award.

