

BioSyM Seminar Series 2018

Simultaneous Measurement and Reconstruction Tailoring for Phase Imaging (SMaRT-Phi)

Dr. Zhengyun Zhang

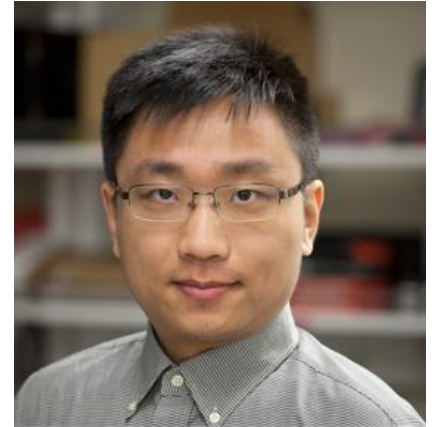
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Date : 26th February 2018, Monday

Time : 12 pm to 1 pm

Venue : Level 5, Perseverance Room



Abstract

Quantitative phase imaging is a method for imaging normally transparent specimens without using invasive labeling to generate contrast. For a thin specimen, the phase image is a map of either its spatially varying index of refraction or thickness, which can yield clues to what is happening chemically or biologically within the specimen. Noninterferometric phase imaging techniques, which include transport of intensity equation (TIE) methods and contrast transfer function (CTF) methods, are attractive for biological studies, as the phase image is numerically computed from images which can be obtained from standard optical microscopes. We recently developed a new approach that takes input calibration data and yields a jointly optimal design for the measurement and reconstruction process so as to minimize the average reconstruction error in the phase image, which can minimize total exposure time needed for a desired reconstruction quality level. The technique has been demonstrated on standard phase targets, and we hope to further improve it for application to time-lapse in vitro imaging studies.

Short Biography

Zhengyun joined SMART-BioSyM in 2011 as a postdoctoral researcher working under Prof. George Barbastathis after obtaining his doctoral degree in Electrical Engineering from Stanford University. His research interests are in computational imaging, inverse problems, phase space and optimization.