

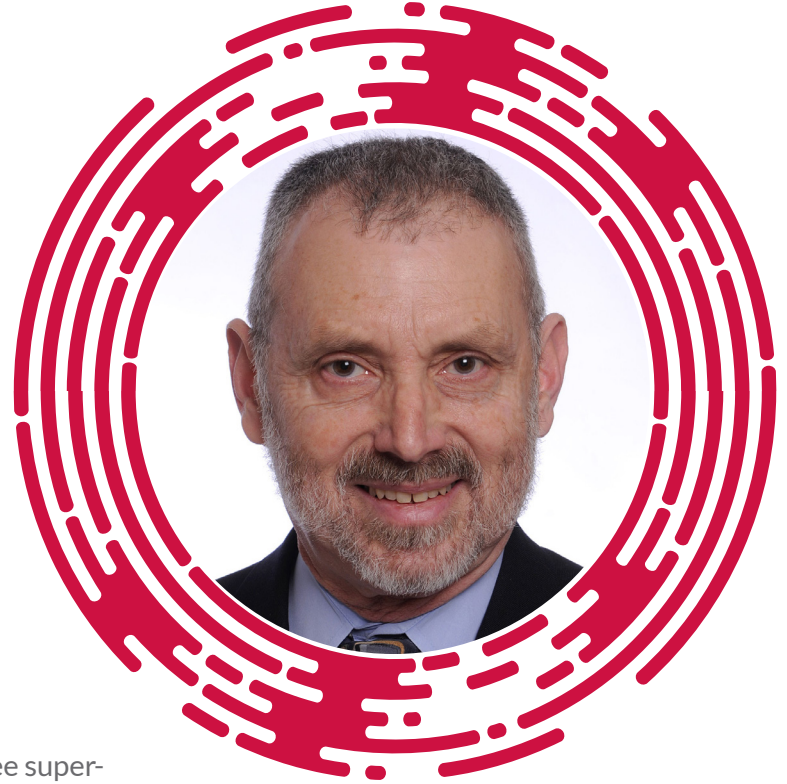


Department of
Biomedical Engineering
UNIVERSITY OF WISCONSIN-MADISON

Spring 2019 Seminar Series

Sectioning with Single-View Structured Illumination

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Structured illumination microscopy (SIM) is one of three super-resolution imaging techniques that won the Nobel Prize in chemistry in 2014. Structured illumination microscopy is also useful for sectioning in scattering materials such as human skin, but most techniques involve multiple images, which make the technique less useful because of motion during the measurement.

The focus of our work is on sectioning to produce three-dimensional images of skin similar to those of confocal reflectance microscopy. We have developed a new technique that can use a single image for sectioning skin instead of the three images usually used in SIM. While a single-image technique is conceptually inferior to the traditional three-image SIM, in the presence of severe heterogeneous refraction and the motion that is inherent in in-vivo imaging, the single image is significantly better. I will discuss the concept and show results on different types of samples.

Charles DiMarzio is associate professor of Electrical and Computer Engineering at Northeastern University in Boston, Massachusetts. He is also affiliated with the Department of Mechanical and Industrial Engineering and the Department of Bioengineering. He is particularly interested in imaging through highly scattering materials such as biological tissue. Recently his work has focused on structured illumination, as well as interaction of light and ultrasound. Prior to joining Northeastern, he was an engineer at Raytheon Company working on Doppler Lidar. He is a topical editor in the area of microscopy for Optics Letters.



Monday, April 22, 2019
12 PM in Tong Auditorium (1003 Engineering Centers)