The Institute of OPTICS

Colloquium

University of Rochester

Limits of Design in Computational Spectroscopy

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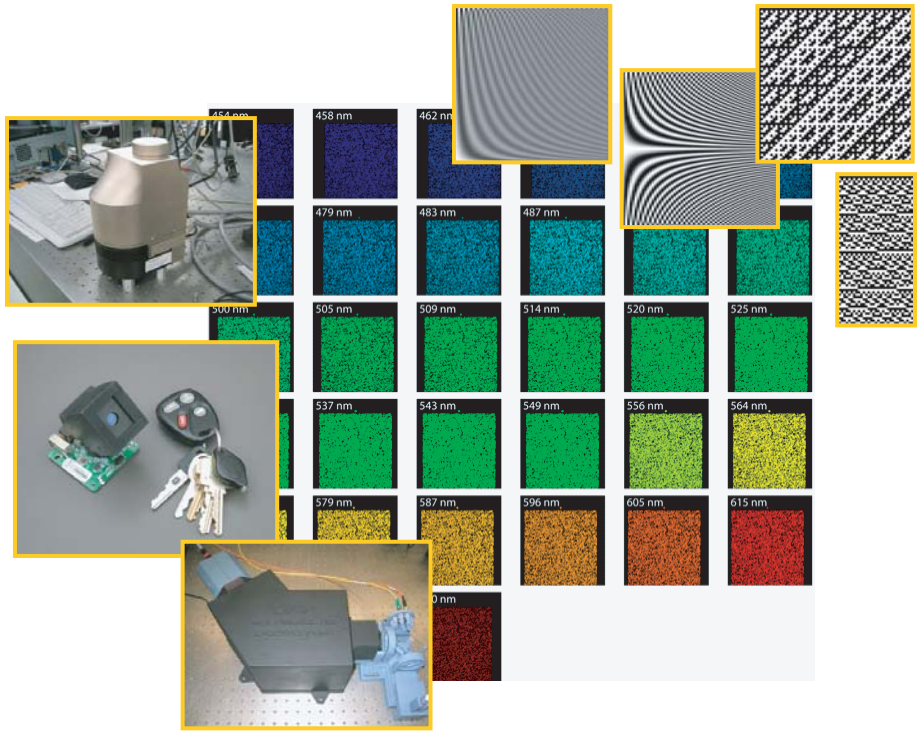

In this talk he will show that co-design of sampling and computational signal estimation algorithms enables revolutionary improvements in optical sensor systems

3:00-4:00 pm, Monday
February 23, 2009
Sloan Auditorium, Goergen Building
Refreshments served

Limits of design in computational spectroscopy

David J. Brady
Professor of Electrical and Computer Engineering
Duke University

Abstract

Co-design of sampling and computational signal estimation algorithms enables revolutionary improvements in optical sensor systems. Design advances have been particularly pronounced in spectroscopy and spectral imaging, where long standing relationships between system volume and resolving power, spectral efficiency and throughput and sampling rate and resolution have been challenged and revised. This talk considers example designs using coded apertures and decompressive inference, focusing particular attention on multimodal multiplex spectrographs and coded aperture snapshot spectral imagers. The talk also considers emerging designs based on micro-resonator arrays, plasmonic structures and feature-specific inference.

Biography

David J. Brady is Professor of Electrical and Computer Engineering at Duke University, where he leads the Duke Imaging and Spectroscopy Program. Professor Brady has developed numerous computational optical imaging and spectroscopy systems. His invention of multimodal multiplex spectroscopy was awarded a 2006 R&D 100 award. He is also the author of "Optical Imaging and Spectroscopy," which will be released in March 2009 by OSA-Wiley. Prior to joining the Duke Faculty, Brady was on the faculty of the University of Illinois. He earned a B. A. in physics and math from Macalester College and M.S. and Ph. D. degrees in Applied Physics from the California Institute of Technology. Brady is also Chief Scientist and member of the Board of Directors at Centice Corporation, which manufactures Raman pharmaceutical analysis systems, and is Chief Scientist and Chairman of the Board of Directors at Applied Quantum Technologies, which manufactures spectral imaging systems. Brady is a fellow of OSA, SPIE and IEEE.