

**Title:** Rapid Scanning Optical MEMS Devices and Their Biomedical Imaging Applications

**Speaker:** Prof. Huikai Xie, Department of Electrical and Computer Engineering, University of Florida

**Time and Location:** 2:30 – 3:30pm, 260 Dreese Laboratory

**Abstract:**

Over half million people die of cancer in US each year. The high cancer mortality is mainly due to the lack of early cancer detection modalities especially for internal organs. CT, MRI and ultrasound imaging have issues of low resolution, low contrast, safety, or high cost. Several optical imaging techniques provide high-resolution cross-sectional information suitable for in vivo noninvasive early cancer diagnosis. However, these optical imaging systems are bulky and slow, and thus are difficult to apply to internal organs where most cancers are originated. Microelectromechanical systems (MEMS) technology offers the advantages of small size and fast speed and can be used to miniaturize optical imaging probes. In this talk, a unique MEMS technology that can create rapid scanning micromirrors and microlenses will be introduced. These MEMS devices in turn enable endoscopic optical “biopsy” modalities, resulting in a paradigm shift of optical imaging of internal organs. In particular, MEMS based endoscopic optical coherence tomography (OCT) imaging, nonlinear optical imaging and confocal imaging will be introduced and experimental results will be presented.

**Biography:**

Dr. Huikai Xie is an Associate Professor at the Department of Electrical and Computer Engineering of the University of Florida. He was an assistant professor at the same department from 2002 to 2007. He received his Ph.D. degree in electrical and computer engineering from Carnegie Mellon University in 2002. From 1992 to 1996, he was a research faculty member and lecturer at the Institute of Microelectronics at Tsinghua University, Beijing, China. He received the Small Times® magazine Best of Small Tech Researcher of the Year award in 2006. He has published over 90 technical papers, and has four US patents granted and ten US patents pending. He has served in the technical program committees of several international conferences in the areas of MEMS and photonics. His present research interests include micro/nanofabrication, integrated inertial sensors, microactuators, integrated power converters, optical MEMS, biomedical imaging and fiberoptic sensors. His research has been supported by various federal, state and industrial funding sources including NSF, NASA, AFRL and Florida Photonics Center of Excellence.