

Department of Computer Science  
University of Houston

**SEMINAR SPRING 2011**

**WHEN:** MONDAY, MAY 9, 2011  
**WHERE:** PGH 232  
**TIME:** 10:00 AM

**SPEAKER:** Dr. Badri Roysam, UH-Cullen College of Engineering

Host: Dr. Ioannis Kakadiaris

**TITLE:** The FARSIGHT Project: Computational Image Computing Tools for Biomedicine

**Abstract:**

Modern optical microscopy has grown into a multi-dimensional imaging tool. It is now possible to record dynamic processes in living specimens in their spatial context and temporal order, yielding information-rich 5-D images (3-D space, time, spectra). The task of analyzing these images exceeds human ability. There is a need for automated systems to map the tissue anatomy, quantify structural associations, identify critical events, map event locations and timing, identify and quantify spatial and temporal dependencies, produce meaningful summaries of multivariate measurement data, and compare 4-D/5-D datasets for testing hypotheses, exploration, and systems modeling. Importantly, there is a need for “computational sensing” methods capable of exceeding human ability.

In this talk, I will describe FARSIGHT - an open source toolkit being developed in my laboratory for analyzing multi-dimensional images of cells and tissue. I will use examples from neuroscience, cancer histopathology, immunology, and retinal stem-cell biology to show the practicality of multi-dimensional image analysis and computational sensing.

**Bio:**

Dr. Roysam joined the college as Hugh and Lillie Cranz Cullen University Professor and department chair in fall 2010. Previously, he served as professor of electrical, computer and systems engineering and professor of biomedical engineering at Rensselaer Polytechnic Institute. He also served as associate director of the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems, a National Science Foundation Engineering Research Center, and co-director of the Rensselaer Center for Open Source Software. His research interests include the study of algorithms and high-speed computing for imaging and image analysis with applications in biomedicine and biotechnology. He is working on the computational synthesis of molecular imaging systems, mapping of gene transcription activity, automated neuron and vessel tracing, biological image change analysis, laser retinal surgery and assay automation.