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.