



***Dallas Chapter of IEEE Signal Processing Society &
Electrical Engineering Seminar Series Present***

Optical Imaging and Cancer Diagnosis Enhanced by Signal Processing Techniques

**Professor Hanli Liu
University of Texas at Arlington**

**11:00am, Wednesday, March 28, 2012
ECSS 2.102 (TI Auditorium)**

In recent years, optical spectroscopy and measurements have been used to obtain functional brain imaging and cancer diagnosis. In principle, most of raw data taken from biological specimens or from human subjects contain noises and unwanted signals that interfere with actual physiological signals needed to be recovered. Many signal processing techniques can be used to filter out systemic fluctuations and instrument noises, as well as to retrieve biological features hidden in the measured data. The speaker has been recently collaborating with a couple of UTA faculty who have expertise in signal processing, so the speaker's group is able to form better functional brain images and to identify cancer signatures more accurately and efficiently. This talk will present several examples of recent developments: (1) using adaptive filter to remove physiological noises, (2) integrating sparse image reconstruction algorithm with noise normalization, and (3) performing feature extraction to select optimal spectral characteristics for breast cancer diagnosis. By the end, several potential applications of signal/image processing for further developments will be discussed.

Dr. Liu received her Ph.D degree in 1994 in the field of experimental laser physics, followed by her post-graduate training in the field of tissue optics and diffuse optical imaging in the University of Pennsylvania until 1996. Since then, she has joined UT Arlington and has been very active in research in the areas of tissue optics and optical imaging with the following record: she has (1) obtained or secured ~\$7 million external funding for her research over the last 15 years, (2) published over 80 peer-reviewed journal papers and 100 conference proceeding papers or abstracts, (3) been invited to deliver 40 scientific seminars at different institutions nationally and internationally, and (4) collaborated closely with a variety of clinicians and life scientists. Dr. Liu's research development has been enhanced in the brain imaging area for the last 5-6 years after she received a significant amount of equipment fund from the State of Texas (as faculty retention fund) and purchased several state-of-the-art diffuse optical brain imagers for both human and animal measurements.

For more information on the Dallas Chapter of IEEE Signal Processing Society and directions to UTD, see <http://www.utdallas.edu/~kehtar/ieee-sp>