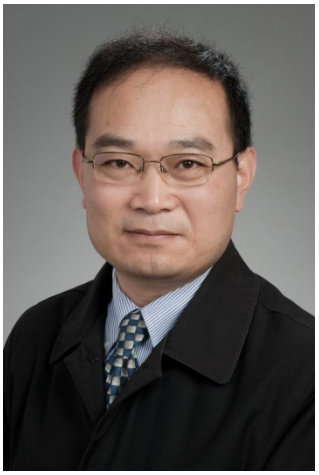
McCormick

Northwestern Engineering

# BME Seminar Series



## Ruikang Wang, PhD

*Professor*
*Departments of Bioengineering & Opthalmology*
*University of Washington*

**"The Light Works: Non-Invasive Optical 3D Imaging of Microstructure and Microcirculation within Tissue Beds In Vivo"**

**Thursday, May 22nd**
**Tech L361**
**4:00 – 5:00 PM**
Reception to follow, 2nd floor Willens Atrium

Advances in optical technologies have spurred many new applications of light in biology and medicine. The expanding fields of optical diagnostics and therapeutics include such diverse topics as photodynamic therapy for cancers and other diseases, fluorescence endoscopy for early tumor detection, photoacoustic imaging for deep tissue vascular visualization, and optical coherence tomography (OCT) for superficial tissue assessment. OCT is a new medical imaging modality in which the coherent interference of a wide spectrum light source is used to create a high resolution (micron-scale) subsurface image of tissue microstructure. Recently, we have supplemented the microstructural OCT images with additional contrast mechanisms such as blood flow imaging using the static and dynamic (Doppler) speckle effects, which provide us the ability to perform label-free optical microangiography (OMAG) of microcirculatory tissue beds. The ability to visualize tissue blood flow at the microcirculation level is important in a variety of biomedical applications, some of which (along with the OCT basics and the enabling technologies) will be highlighted in this talk. Examples using OMAG to delineate the dynamic blood perfusion, down to capillary level resolution, within living tissue will be given, including cerebral blood flow in small animals and retinal blood flow in humans.