

**Thursday, September 30<sup>th</sup>**

Scaife Hall Auditorium  
Room 125

4:30 p.m.

Refreshments at 4:00 p.m.



**Bin He, PhD**  
Distinguished McKnight  
University Professor  
University of Minnesota

**Dr. Bin He** is a Distinguished McKnight University Professor and Professor of Biomedical Engineering, Electrical Engineering, and Neuroscience at the University of Minnesota, where he serves as the Director of Center for Neuroengineering and Director of NIH Training Program in Neuroimaging. Dr. He's major research interests include neuroengineering, functional biomedical imaging, and bioelectromagnetism. He has pioneered the development of electric source imaging, and made significant contributions to functional neuroimaging, brain-computer interface, and magnetoacoustic tomography. He is the Editor of the book entitled "Neural Engineering," and serves as an associate editor or editorial board member of multiple international journals including IEEE Transactions on Biomedical Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering, IEEE Spectrum, Journal of Neural Engineering, Clinical Neurophysiology, and Brain Topography. Dr. He was the recipient of NSF CAREER Award, American Heart Association Established Investigator Award, and is a Fellow of IEEE, American Institute of Medical and Biological Engineering, and Institute of Physics. He is the 2009-2010 President of the IEEE Engineering in Medicine and Biology Society.

## **Spatio-temporal Functional Neuroimaging of Brain Activity**

### **Abstract:**

Brain activity is distributed over the three-dimensional brain and evolves over time. Over the past decades, functional neuroimaging has emerged as an important interdisciplinary research area. This has been in particular promoted by the development of functional MRI and the significant advancement in electrophysiological neuroimaging using EEG/MEG. We will review our work in electrophysiological neuroimaging integrating EEG with structure MRI, and show its applications to aid presurgical planning in epilepsy patients. We will also review our work on multimodal functional neuroimaging integrating electrophysiological and hemodynamic measurements to significantly enhance the spatio-temporal resolution of imaging brain activity. Our recent work indicates that, the event-related BOLD fMRI and electrophysiological data can be integrated in a principled way, leading to high-resolution spatio-temporal functional imaging of the dynamic brain activation. We will also review the investigation of co-localization of hemodynamic and electrophysiological signals associated with motor imagery for brain-computer interface applications, using BOLD fMRI and electrophysiological neuroimaging.

### **ECE Seminar Hosts**

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