

WHITAKER BIOMEDICAL ENGINEERING INSTITUTE

DEPARTMENT OF BIOMEDICAL ENGINEERING FRIDAY SEMINAR SERIES

Bin He, Ph.D.

**Professor
Department of Biomedical Engineering
Director of Biomedical Functional Imaging and Computational Lab
University of Minnesota**

“Electrophysiological Neuroimaging: Principles and Applications”

DATE: October 14, 2005

TIME: 1:00 p.m. – 2:00 p.m.

PLACE: **Traylor 709**

Host: Dr. Nitish Thakor

Abstract:

Brain electrical activity is distributed in the three physical dimensions and evolves in time. It is of importance to image brain electrical activity with high resolution in both the space and time domain. In this presentation, we will discuss electrophysiological neuroimaging approaches to estimate dynamic electrical sources associated with brain activation from noninvasive EEG and MRI. In particular, we will discuss a novel electrophysiological cortical imaging approach which we have developed for noninvasive imaging of spatial distribution of electrocorticogram (ECoG). We demonstrate that our electrophysiological cortical imaging technique can reconstruct well cortical potentials from the scalp potentials in a realistic geometry multi-layer inhomogeneous head model, as assessed by direct intracranial recordings. Our experimental validation studies in a group of patients undergoing neurosurgical evaluation demonstrate that cortical imaging can reveal areas of activity that overlap with cortical regions displaying epileptiform activity, as confirmed by successful neurosurgery in the patients. The promising experimental and clinical results suggest that electrophysiological neuroimaging promise to substantially enhance our capability to image brain electrical activity, and play an important role in aiding presurgical planning in epilepsy patients.

Any questions, contact 410-955-3132.

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**JOHNS HOPKINS UNIVERSITY
720 RUTLAND AVENUE, BALTIMORE, MD 21205**

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Contact: Joyce Bankert: 410-955-3132: jbankert@bme.jhu.edu