



Electrical Engineering Colloquium
Dallas Chapter of IEEE Signal Processing Society Presents

“Technical Problems and Challenges in fMRI of Brain Activity”

Dr. Richard Briggs and Dr. Kaundinya Gopinath

&

**"Understanding Brain Circuits: Data Analysis in Functional
Neuroimaging"**

Dr. Michael Devous

University of Texas Southwestern Medical Center

Room ECSN 2.110

Thursday, March 25, 2004

11:00 am

1) Brain activation imaging with BOLD fMRI offers an array of challenging technical problems. These can be classified into two main categories: (A) stimulus presentation and response monitoring hardware and software, RF coil engineering, and integration with other imaging techniques; (B) image analysis (segmentation, feature extraction, registration, morphometric normalization), statistical signal processing (time series analysis, signal detection and estimation, noise structure), and nonlinear systems analysis.

2) Functional Neuroimaging provides tremendous insight into the active circuitry of the brain, but at the same time provides substantial challenges to image analyses. A brief insight into the complex problems associated with understanding and interpreting these multifaceted data sets will be provided, including examples from speech research and from addiction research.

Brief Biographies

Dr. Briggs is Professor of Radiology and Director of Neuroimaging Research in the Division of Neuroradiology at the University of Texas Southwestern Medical Center at Dallas. Dr. Briggs has authored over 70 refereed articles and 125 abstracts, has written 5 book chapters, holds 2 patents, and has been Principal Investigator or Co-Investigator of 30 peer-reviewed grants.

Dr. Gopinath is Instructor of Radiology at the UTSW. Dr. Gopinath has authored 10 refereed articles and 40 abstracts, and has played a key role in 8 peer-reviewed grants.

Dr. Devous is Professor of Radiology, Radiological Sciences and Bioengineering and Associate Director of the Nuclear Medicine Center at the University of Texas Southwestern Medical Center and Adjunct Professor of Brain and Behavioral Sciences at the University of Texas at Dallas. He has authored more than 100 peer-reviewed articles, 200 abstracts, and 30 books or book chapters, and is currently Principal or Co-Investigator on three NIH grants and a Dana Foundation Grant.