



Electrical Engineering Graduate Seminars
Dallas Chapter of IEEE Signal Processing Society Presents

**Active Reduction of Acoustic Noise and Enhancement
of Speech for fMRI Environment**

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Friday, October 19, 2007, 11AM, Room B242
Research Park, University of North Texas, Denton

Presence of high level acoustic noise in fMRI room interferes with imaging process and speech communication between the patient and medical staff. It also creates a harmful and annoying environment for both patients and care providers. To alleviate the negative effects of strong acoustic noise in the fMRI room, we have been developing active noise control (ANC) and speech enhancement (SE) systems. In this presentation, we review analysis and design of ANC and SE adaptive algorithms using uniform sub-band filtering techniques in order to deal with the strong broadband (8KHz) acoustic noise in the fMRI room. Development of a blind room dereverberation technique and a sequential blind source separation method are presented. Realization of the methods on a test-bed mimicking the fMRI bore is discussed and the results of real-time implementation of the algorithms are demonstrated.

Issa M.S. Panahi received his PhD in Electrical Engineering in 1988 from the University of Colorado at Boulder. Dr. Panahi is an assistant professor and Director of Statistical Signal Processing and Acoustic Research Laboratories in the Department of Electrical Engineering, University of Texas at Dallas (UTD). Research interests and experience of Dr. Panahi are in the areas of MIMO digital signal processing, estimation, system identification, noise cancellation, speech enhancement, and embedded DSP systems. Dr. Panahi joined UTD in 2001 after being with Texas Instruments, Shell Oil Co.-Bellaire Research Center, and Storage Technology Corp. (currently Sun Microsystems) for 16 years. He holds one US patent and has authored/co-authored 5 Texas Instruments books, and published over 60 conference, journal, and technical papers. He co-founded the IEEE Dallas Chapter of Engineering in Medicine and Biology Society (EMBS) in 2006. He is currently Vice-Chair of the IEEE Dallas Chapters of EMBS and Signal Processing Society. He served as the Secretary and Treasurer (2004), and Program Chair (2005) of the IEEE Dallas Chapter of Signal Processing. He was the 2005 recipient of the "Outstanding Service Award" from the IEEE Dallas Section.

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