

**University of Houston
Department of Computer Science
Distinguished Lecturers Spring 2007 Seminar**

Speaker: Dr. Nikolaos Tsekos, Washington University in St. Louis

WHEN: Wednesday, April 18, 2007

WHERE: PGH 563

TIME: 11:00 AM

Host: Prof. Pavlidis

Title: Methods for Interventions with Real-time MRI Guidance

Abstract:

Magnetic resonance imaging (MRI) is an emerging modality for planning and visualizing diagnostic and therapeutic image guided interventions (IGI). MRI offers certain unique benefits: plethora of contrast mechanisms to assess tissue pathophysiology, lack of ionizing radiation and true 3-D imaging. Areas of challenge and potential advancement in interventional MRI include those of dynamic imaging and visualization, addressing the limited access to the patient and the implementation of multi-modality guidance by incorporating molecular level imaging. We will present dynamic MR imaging approaches that include strategies for the selective acquisition of raw MR data (inverse or k-space), fast MRI preparations for the manipulation of tissue contrast, and multiplanar volumetric imaging. In addition, two MR-compatible systems will be presented, developed for interventional procedures in the breast and the body that offer direct access to the patient inside cylindrical high magnetic field MRI scanners. We will also discuss the integration of the robotic manipulator with the MR scanner, for on-the-fly control of the imaging plane(s) to follow the procedure in real-time. Finally, we will overview current needs in multi-modality IGI (i.e., MR and localized optical imaging), real-time image processing, human-machine haptic interfacing and augmented reality visualization of procedures in real-time.

Bio:

Nikolaos V. Tsekos received his BS degree in Physics from the National and Kapodistrian University of Athens, his M.Sc. degree in Physiology and Biophysics from the University of Illinois in Urbana Champaign and his PhD from the University of Minnesota in Minneapolis. His research is focused on the development of cardiovascular and interventional MRI methodology, and includes the areas of dynamic MRI and MR-compatible robotics for performing interventions with real-time MRI-guidance. His work has been funded by the NIH, the Whitaker Foundation, the American Heart Association and the RSNA. He is an Assistant Professor of Radiology and Biomedical Engineering at the Washington University in St. Louis.