



JOHNS HOPKINS

BIOMEDICAL ENGINEERING



Friday, February 27, 2009, 1:00 PM in Traylor 709

Teleconferenced to Clark 110

Light lunch will be provided at 12:15 in Traylor 709



Real-time interactive MRI for cardiovascular interventional procedures

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Hosted by Elliot McVeigh

Abstract Can MRI provide satisfactory image guidance of intravascular or minimally invasive surgical procedures? Currently, most of these types of procedures are being performed under the guidance of x-ray, ultrasound or a combination. X-ray provides excellent spatial and temporal resolution, but does not show soft tissue very well and exposes the doctor and patient to potentially harmful radiation.

Although MRI does not provide nearly the resolution of x-ray, there is superior soft tissue contrast. With modern improvements in hardware and reconstruction algorithms, MRI can produce "real-time" images in excess of 10 frames per second, however at reduced image quality compared to ECG-gated images. Invasive devices may be tracked within the body during imaging. Slice locations and imaging parameters can be changed interactively. MRI provides a rich imaging tool set, but clinical scanners are not packaged with the flexibility needed for an interventional procedure, where many changes should be made on-the-fly.

Numerous research groups have been investigating MRI guided interventional procedures for several years. Some of these groups have attached their own workstations to the clinical scanner for control of the user interface and image reconstruction. There have been many compelling results, but clinical adoption remains elusive. Some of the issues are safety of devices, access to the entry site, real-time image quality and the complicated nature of MR imaging.

I will present some work done in my collaborations and other labs, and show steps we have taken to make the clinical MR scanner more useful for real-time interactive imaging. I will also show some examples of different interventional procedures performed in an experimental animal setting and discuss what may lie ahead.

Upcoming Seminar:

March 2: Molly Shoichet, University of Toronto

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