



**You are cordially invited to attend the following seminar sponsored by
the Department of Mechanical Engineering:**

**Friday, October 19, 2007
114 Spencer Lab, 12:15 – 1:15 P.M.**

*Dr. Allison Okamura
Johns Hopkins University*

“HAPTICS FOR ROBOT-ASSISTED SURGERY”

Abstract:

Robot-assisted surgery can improve the outcomes of medical procedures by enhancing accuracy and minimally invasive access, thereby reducing patient trauma and recovery time. However, the current lack of haptic (force and tactile) information compromises system performance. This talk will examine the role of haptics in three types of systems: (1) telemanipulation systems, in which the patient is remote from the operator, (2) cooperative manipulation systems, in which the robot and the operator physically "share" a surgical tool, and (3) autonomous systems, in which the surgery is carried out by the robot, with guidance from imaging systems or other sensors. Our work on telemanipulation focuses on control system design, force sensing and feedback mechanisms, and techniques for evaluating surgeon performance, with applications in cardiothoracic surgery. Research in cooperative manipulation is directed toward microsurgical procedures and the development of methods to automatically provide "virtual fixtures" that assist the surgeon. In autonomous systems, we consider tool-tissue interaction modeling for virtual environments that can be used for planning or training, as well as needle steering for improved dexterity and targeting accuracy.

Refreshments will be served