



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

Friday, November 16, 2007
114 Spencer Lab, 12:15 – 1:15 P.M.

Dr. Nitish V. Thakor
Johns Hopkins University

“Body or Brain? Control of Dexterous Prosthesis”

Abstract:

Another prosthetics revolution is underway. This time around, sophisticated multi-fingered prosthetic hands are under development that would provide unprecedented capabilities to amputees. This opportunity also raises the question: how should the multi-fingered prosthetics be controlled: by “body” (through proprioception of muscle signals) or “brain” (nerve or through direct cortical interface)? I will present the current status of the prosthetics technology and then present the two approaches: muscle (EMG) and brain (EEG and neural signals) to analyze and interpret the control of dexterous hand. We use advanced neural network and statistical signal processing methods to decode the biological signals. The experimental studies and decoding results are exciting: we are able to achieve between 90 and 99% accuracy decoding from surface EMG signals as well as decoding neural population signals to control individual fingers in the prosthesis. Going forward, the challenges are many: development of the dexterous prosthesis, sensors and haptic feedback, control of the manipulator, decoding the neural signals, and most difficult of all, implementing the chronic neural/muscular interface for an implantable prosthetic system.

Refreshments will be served

