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**Seminar Series**

# Feeling, wired: somatosensory neural interfaces for neural prostheses


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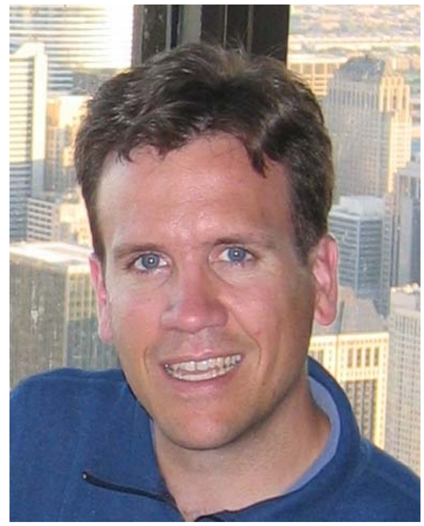

**FRIDAY, MARCH 4, 2011**
**LECTURE: 1:00 PM - 2:30 PM**

**ENGINEERING CENTER**
**ROOM EC 2300**
**10555 WEST FLAGLER STREET**
**MIAMI, FL 33174**


**Abstract:** Over the last 2 decades, advances in microfabrication and digital signal processing technologies have enabled the development of neural prostheses that interface directly with neurons in the brain, spinal cord and peripheral nerves. These so-called "neural interfaces" serve as bi-directional communication channels, allowing information to be *read-out* by decoding signals recorded from neurons or *written-in* via patterned electrical stimulation of neurons. We are exploiting these technologies for two purposes: 1) to advance our understanding of how the nervous system senses and controls limb motion, and 2) to develop advanced prosthetic devices that interface directly with the nervous system for control. My talk will focus on research in my lab that is aimed at understanding how somatosensory neurons encode information about touch, force, limb position and motion. By recording and decoding the output of these neurons, we can obtain feedback signals for controlling functional electrical stimulation (FES) systems to reanimate paralyzed limbs. Conversely, patterned stimulation of somatosensory neurons can be used to provide amputees with touch and proprioception for prosthetic limbs.


**Biography:** Douglas J. Weber (M'94) received the B.S. Degree in biomedical engineering from the Milwaukee School of Engineering in 1994 and the M.S. and Ph.D. degrees in Bioengineering from Arizona State University in 2000 and 2001, respectively. He is currently an Assistant Professor in the Department of Physical Medicine and Rehabilitation, University of Pittsburgh. He is also a faculty member in the Department of Bioengineering and the Center for the Neural Basis of Cognition. Previously, he was a Postdoctoral Fellow in Dr. Richard Stein's lab at the University of Alberta. His primary research area is neural engineering, with particular emphasis on applications to rehabilitation technologies and practice. Specific research interests include functional electrical stimulation, activity-based neuromotor rehabilitation, neural coding, and neural control of prosthetic devices. Currently, his research is supported by grants from the National Institute of Biomedical Imaging and Bioengineering (NIBIB) and the US Army's Telemedicine and Advanced Technology Research Center (TATRC).

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