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Biomedical Engineering
Wallace H. Coulter Foundation
Seminar Series

"Neural Control of Hand Movement"

Dr. Martha Flanders
Professor of Neuroscience
University of Minnesota Medical School

Friday, September 7, 2012
LECTURE: 9:00 AM - 10:00 AM

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

Abstract:
The fields of prosthetics and robotics consult the neurophysiology literature for help in understanding neural mechanisms for the normal control of human movements. But this literature is filled with controversy. A currently popular view is that movement is controlled by a small number of muscle synergies. This seminar will feature the alternative hypothesis of highly distributed control by collections of motor units. The neuromuscular control of hand movement must be coordinated with somatosensory feedback and the seminar will also include current research in the field of haptics, i.e., active sensing by the use of tactile and proprioceptive feedback. Experiments using a robot arm to create virtual surfaces have led to a model of feedforward predictions, conveyed by efference copy, being used in combination with tactile feedback.

Biography
Martha Flanders received her PhD degree in Neuroscience/Zoology from Michigan State University. She is a professor in the Neuroscience Department at the University of Minnesota, USA, and a visiting professor in the Biophysics Department at Radbound University, the Netherlands. From 2007-2009, she served as Program Director at the National Science Foundation, where she coordinated funding for Neurobiology and Computational Neuroscience. Her ongoing research is supported by the National Institute of Neurological Disorders and Stroke. The initial focus of this research on neuromuscular control of arm and hand movement has shifted toward the somatosensory guidance of these movements and she is currently an Associate Editor of IEEE Transactions on Haptics.

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