

Joint Basic Medical Sciences and Biomedical Informatics Departmental Seminar Series

*A weekly lecture series covering diverse topics
in the biomedical sciences*

The Department of Biomedical Informatics presents:

Adaptive Biomimetic Technology to Promoting Neural Adaptation

Jimmy Abbas, PhD

Center for Adaptive Neural Systems and
Harrington Department of Bioengineering
Arizona State University

Neural systems often adapt in response to the patterns of activity across the network of neurons. This type of adaptation, or activity-dependent plasticity, is likely to be the primary process involved as a child learns how to ride a bike or as a spinal cord injured person re-learns how to walk. Several rehabilitation technologies are designed to promote adaptation in neural systems and recovery of function by tapping into these processes of activity-dependent plasticity. This talk will describe the use of adaptive technology to promote neural adaptation in a rehabilitation setting. We have designed and developed a system to control movements using electrical stimulation of paralyzed muscles. The system is biomimetic in that it is based on a model of the spinal cord circuitry responsible for controlling locomotion. The rationale for this approach is that technology that operates like a nervous system may be readily integrated with the biological system and may be highly effective in promoting adaptation. Results will be presented from evaluations of this technology in computer simulation studies, in a rat model of spinal cord injury, and in studies on people with spinal cord injury.

About the Speaker

James J. Abbas, PhD received his B.S. in bioelectrical engineering from Brown University in Providence, RI and his M.S. and Ph.D. in biomedical engineering from Case Western Reserve University in Cleveland, OH.

He is currently an Associate Professor in the Harrington Department of Bioengineering in the Fulton School of Engineering and is co-director of the Center for Adaptive Neural Systems (<http://ans.asu.edu/>) at Arizona State University. Dr. Abbas is on the Editorial Board of the Journal of Neuroengineering and Rehabilitation and has served as an officer of the International Functional Electrical Stimulation Society. His research interests are in applications of neural engineering techniques and technology in the area of medical rehabilitation. Current projects include the development and assessment of systems that use electrical stimulation for therapy after spinal cord injury, systems to improve neuromotor control in children with CP, systems to restore sensory capabilities to amputees, and techniques to improve sensorimotor function in people with Parkinson's Disease.



Date

Thursday, October 23, 2008

Time

Noon - 1 pm

Locations

Virginia G. Piper Auditorium, 600 E.

Van Buren, Phoenix

Teleconferenced to ASU Brickyard
(BYENG 365)

Teleconferenced to Tucson (Room
3230)

Refreshments

Light refreshments will be served

Hosts

The Department of Basic Medical Sciences is part of The University of Arizona College of Medicine. Biomedical Informatics is part of the School of Computing and Informatics in the Ira A. Fulton School of Engineering at Arizona State University.