Engineering Neuroscience & Health

Department of Biomedical Engineering Division of Biokinesiology and Physical Therapy

ENH SEMINAR SERIES

Presents:

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Monday

November 7, 2011

4:00 p.m.

Pizza will be served: 3:30— 4 pm

"Motor coordination is habitual rather than optimal"

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Any biological or artificial control system capable of producing coordinated movement of the human body requires a method to select specific patterns of muscle activation that will achieve task goals from an infinite set of possible alternatives.This problem of redundancy can be solved in principle by optimisation processes, which arrive at unique solutions to task execution by minimizing specific costs associated with a movement, such as energy use or end-point variability. Computational models of motor coordination based on the mathematics of optimal control theory are currently highly influential. However, how the nervous system achieves behaviour that appears "optimal" is not known. Here, we show that solutions to muscle redundancy in force production are robust to transient changes in limb biomechanics. The results demonstrate that solutions to muscle redundancy are not continuously optimized for biomechanical changes. Rather, robust solutions are distributed over the motor networks that have evolved and developed with the particular musculoskeletal system they control.

Locations: *Seminar is simultaneously presented*

UPC: HNB 100 — LIVE
Hedco Neurosciences Building
UPC Campus Map/Directions:
http://www.usc.edu/about/visit/upc/

HSC: CHP 147 – Video Conference
Center for the Health Professional
HSC Campus Map/Directions:
http://www.usc.edu/about/visit/hsc/

Organized by Professor Francisco Valero-Cuevas http://bbdl.usc.edu/ENH

Web Cast
http://capture.usc.edu/college/Catalog/pages/catalog.aspx?catalogId=946350f1-ca84-40e7-b867-e16adba01e4e

Information about all seminars can be found at
http://bbdl.usc.edu/ENH-Schedule.php