UNIVERSITY OF DELAWARE
ENGINEERING

DEPARTMENT OF BIOMEDICAL ENGINEERING

2020 SEMINAR SERIES

ERIC PERREAULT, PH.D.

Professor and Chair,
Biomedical Engineering

Northwestern University

03/13/20

PATRICK T. HARKER ISE LAB,
ROOM 322
10:30AM

ABSTRACT:

TASK-DEPENDENT REGULATION OF HUMAN LIMB MECHANICS AND THE IMPLICATION FOR DESIGNING REHABILITATION INTERVENTIONS

We have an amazing ability to alter the mechanical properties of our limbs. For example, the human nervous system can change the impedance of our arms by nearly three orders of magnitude, depending on whether the task at hand requires a stiff or compliant interface for interacting with our physical environment. Much of this regulation occurs automatically, relying on the intrinsic mechanics of muscles and the subconscious neural pathways contributing to muscle activation. This presentation will review our work in to how the mechanics of the human upper and lower limbs are regulated across a variety of tasks, and explore the mechanisms contributing to that regulation. It will also demonstrate how knowledge of these behaviors and mechanisms can be used in the design of rehabilitation interventions for restoring movement control after injury.

BIOGRAPHY:

Eric Perreault is Professor and Chair of Biomedical Engineering at Northwestern University, with joint appointments in the Department of Physical Medicine and Rehabilitation, and at the Shirley Ryan AbilityLab. He received his B.Eng. and M. Eng. degrees in Electrical Engineering from McGill University and his PhD in Biomedical Engineering from Case Western Reserve University. Eric's research focuses on understanding the neural and biomechanical factors involved in the control of multi-joint movement and posture and how these factors are modified following neuromotor pathologies such as stroke and spinal cord injury. The goal is to provide a scientific basis for understanding normal and pathological motor control that can be used to guide rehabilitative strategies for individuals with motor deficits. Applications include rehabilitation following stroke, musculoskeletal injuries, and user interfaces for neuroprosthetic control. Eric is a fellow of the American Institute for Medical and Biological Engineering, director of an NIH-sponsored T32 training program in biomedical engineering, and the co-director of an NIH K12 program to support junior engineering faculty conducting research relevant to rehabilitation medicine.

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bme.udel.edu

Department of Biomedical Engineering
161 Colburn Lab | Newark, DE 19716-3130
P: 302-831-6592 | E: bmeg-info@udel.edu