Department of
Biomedical Engineering
UNIVERSITY OF WISCONSIN-MADISON

Fall 2017 Seminar Series

Considering Neural Control & Body Mechanics for the Understanding & Restoration of Human Movement

About the Speaker

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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, chair of the NIH study section on Function, Integration, and Rehabilitation Sciences, 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.

The neural and musculoskeletal systems are intimately linked in the control of movement and posture. The musculoskeletal system serves as a mechanical interface between the computations of our nervous system and our ability to physically interact with the world around us. While the interdependency of these systems is obvious, there remain many scientific studies and clinical assessments of motor behavior that examine the nervous and musculoskeletal systems in isolation. Our laboratory works at the intersection of biomechanics and motor systems neuroscience, with a focus on quantifying and restoring movement control following injury. Our past work has demonstrated how intrinsic muscle properties and musculoskeletal geometry influence the neural strategies for regulating whole limb mechanics. In this presentation, I will introduce two new projects that build on that background. The first investigates the use of non-invasive shear wave elastography for quantifying intrinsic muscle properties in health and disease. The second examines challenges associated with building neuroprosthetic interfaces that restore the volitional activation of muscles in an effort to regain arm control following paralysis.

Monday, November 27, 2017
12 - 1 PM in Tong Auditorium (1003 Engineering Centers)