EXOSKELETON ACTUATION INSPIRED BY AND INFORMING BIOMECHANICS

Featuring Dr. Philippe Malcolm
University of Nebraska at Omaha

November 10, 2017 | 12:00 - 1:15 pm | H&K112
Parking Available in Lot T

ABOUT DR. MALCOLM

Philippe Malcolm did his PhD at Ghent University where he developed the first exoskeleton that reduced the metabolic cost of walking. He worked as a postdoc at Harvard University on the development of a soft textile based exosuit for reducing the metabolic cost of loaded walking. He joined UNO as an assistant professor in 2017. His long-term goals are to expand the diagnostic capabilities of gait analysis, improve gait rehabilitation and inform design of orthoses and exoskeletons.

LEARNING OBJECTIVES

• Humans are effective walkers. However, gait impairments increase the energy cost of walking and limit mobility. Different labs are using biomechanics to optimize exoskeletons in attempt to restore or augment metabolic economy. Philippe Malcolm developed the first exoskeleton that reduced the metabolic cost of walking based on biomechanics experiments in which push-off timing was optimized. In the first part of this seminar he will talk about optimizing exoskeletons for other objectives. In a collaborative effort together with Harvard University and the Wyss study a soft exosuit was optimized to reduce the metabolic cost of running. In ongoing analyses, we are exploring how an exoskeleton can be used to reduce kinematic variability.

• The second half of this seminar will reveal an exciting new direction which involves conducting perturbation experiments with exoskeletons for measuring biomechanical parameters. A long-term goal is to close the circle by using new information which can only be acquired with exoskeletons as data-input for optimizing assistive devices for clinical populations.

The presenter, Philippe Malcolm, Ph.D., and planning committee, Nick Stergiou, Ph.D., Jeffrey Kaipust, M.S., Angela Collins, B.S., and Jackie Farley, CPP have no financial conflict of interest to disclose.

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