

# SEMINAR SERIES

Supported by The Department of Biomechanics and  
The Center for Research in Human Movement Variability (MOVCENTR)



## 100 Ways to Use A Treadmill

Featuring Dr. Jill Higginson

University of Delaware



Friday, Sept. 30 | 12:00 - 1:15 pm | H&K 112

### PRESENTATION ABSTRACT

Recovery of walking function is the most common goal of post-stroke rehabilitation since diminished walking speed following a stroke limits community ambulation and reduces quality of life. Propulsive force generated at push-off is critical to walking speed and is often impaired on the paretic side. Treadmill training is a commonly used rehabilitation strategy, but is typically conducted on a fixed speed treadmill that does not allow for instantaneous and adaptive changes in speed due to propulsion. We introduced an adaptive, user-driven treadmill controller that adjusts treadmill speed in response to users' propulsion impulse and step length in real-time. This presentation focuses on the strengths and limitations of the adaptive treadmill paradigm and introduces our predictive computational simulation framework for treadmill gait. Finally, I will share our vision for how we can expand on this and other research to promote the discovery, development and commercialization of products and processes that significantly advance healthcare through engineering driven health.

### ABOUT DR. HIGGINSON

Dr. Higginson is a Professor in the Departments of Mechanical Engineering and Biomedical Engineering at the University of Delaware. Since August 2019, she has served as Associate Dean of Graduate and Post Graduate Education in the College of Engineering. The fundamental objective of her Neuromuscular Biomechanics Lab is to improve the understanding of muscle coordination for normal and pathological movements through coupled experimental and simulation studies. Computational models are used to develop a cause-and-effect framework that relates muscle impairments to gait deviations to ultimately form a scientific rationale for therapeutic interventions that improve movement.

more info at [cobre.unomaha.edu](http://cobre.unomaha.edu)

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