The Ultimate Machine: Strategies for understanding and improving movement disorders

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Abstract: The human body is the ultimate machine. With billions of connections, hundreds of actuators, and adaptive learning, the human body provides a unique and versatile platform for us to explore with the world. However, the same complexity that empowers the human body also makes it extremely difficult to treat when things go awry. For individuals with movement disorders, such as cerebral palsy and stroke, the ability to move, manipulate, and interact with the world is impaired and negatively impacts quality of life. In this talk, I will discuss how we have been using a combination of musculoskeletal simulation, muscle synergy analysis, medical imaging, and device design to understand how movement is altered after brain injury, evaluate the impacts of current treatments, and design new treatment strategies.

Bio: Kat Steele is an assistant professor in mechanical engineering at the University of Washington. Her research focuses on integrating dynamic simulation, motion analysis, medical imaging, and device design to improve mobility for individuals with movement disorders. She earned her BS in Engineering from the Colorado School of Mines and MS and PhD in Mechanical Engineering from Stanford University. To integrate engineering and medicine, she has worked extensively in hospitals including the Cleveland Clinic, Denver Children's Hospital, Lucile Packard Children's Hospital, and the Rehabilitation Institute of Chicago. She has also helped to develop a free, open-source software platform for dynamic simulation of movement (http://opensim.stanford.edu). More information about Dr. Steele's research and the Ability Lab is available at: http://faculty.washington.edu/kmsteele/