Designing wearable robots to augment human movement

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Abstract: Are wearable robots ready to revolutionize the treatment of movement disorders? Despite medical treatment focused on addressing walking disability, many millions of people with neurological conditions, like cerebral palsy (CP), struggle to preserve independent mobility. While upper and lower limb exoskeletons may hold potential for augmenting human movement, several challenges to adoption remain unaddressed. In this talk, Dr. Lerner will present the latest findings from his research group on how robotic exoskeleton assistance and resistance can improve mobility and neuromuscular function across a range of patient populations. Follow along on the highs and lows of the development journey, spanning electromechanical design, adaptive control and clinical research. Why are wearable robots still hard to find outside of the research lab? Dr. Lerner will also discuss the motivation, challenges, and opportunities for expanding access to exoskeleton technology through commercialization.

Bio: Zach Lerner is an Associate Professor in Mechanical Engineering at Northern Arizona University where he directs the Biomechatronics lab (biomech.nau.edu). His research combines his two great passions in life – robots and human movement. Work in his lab seeks to improve mobility and neuromuscular function in individuals with disabilities through advancement in the design, control, and implementation of robotic exoskeletons. He received the Ph.D. degree in Biomedical Engineering from Colorado State University in 2015 before completing a postdoctoral fellowship at the National Institutes of Health in 2016. Zach is an NSF CAREER awardee and an associate editor for IEEE Robotics and Automation Letters. In 2019, Zach co-founded his lab’s spin-off, Biomotum, Inc. (Biomotum.com), a rehab robotics company.