

## Scientific/Clinical Workshop

### Workshop Title

Modular Robots: A New Approach to Enhancing Rehabilitation Outcomes

### Workshop Responsible

Arun Jayaraman (Shirley Ryan Abilitylab/ Northwestern University)

### Speakers

Arun Jayaraman, Lou Awad, Zach Lerner, Tommaso Lenzi

### Attendee Engagement

we will utilize quick surveys, live demos, and engage in question and answers during the workshop and can provide opportunities for audience to provide hardware, software, clinical use case feedback in real-time

### Abstract

Modular robots or modular robotic exoskeletons are an area of clinical research that has gained substantial attention in the last decade. Interestingly, these devices have learned from complexities faced by full body or lower/upper body powered exoskeletons being used in everyday clinical and community use. Even though the full limb/body powered exoskeletons are brilliant engineering achievements, the bulk, complexity of use, limited use-case scenarios, and cost have sadly made their clinical utility sparse. Modular robots are unique breed of engineering technology which can fit a wide range of impairments and disabilities, providing actuation capabilities at specific joints and enable specific body functions. The modularity of these devices make them lighter in weight, easier to use, and provide the ability to create control systems for specific disease states independently. In this workshop, we will focus on different lower limb modular robots actuating the hip, knee, and ankle, and provide clinical use case scenarios where these devices are used in an acute-care setting, outpatient setting, and home & community settings. Further, we will discuss their use in different clinical populations, the pros and cons, and the future of these devices in a continuum of care environment. We will focus on specific research experiments, the lessons learned, and provide clinical and engineering insight on how these technologies are be further developed and potentially pushed into main-stream clinical care.