

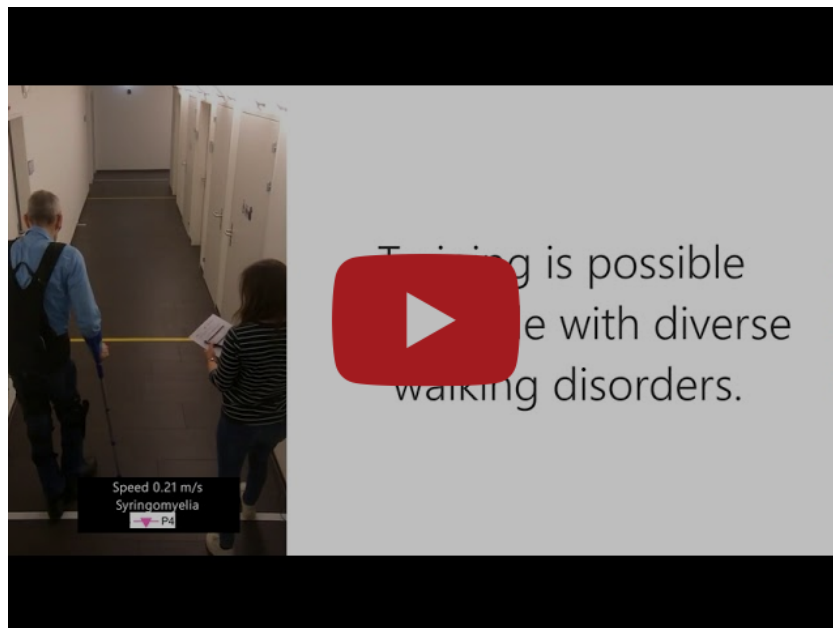
A wearable robot that facilitates training for those with limited mobility

A new study by NCCR Robotics researchers shows the Myosuit can be easily incorporated into physiotherapy sessions for various conditions, improving rehabilitation and exercise



Regular physical activity is key for everyone, especially for those who—as a result of conditions like stroke, spinal cord injuries, heart failure, or simply old age—suffer from mobility impairments. Yet, a large proportion of older adults and people with mobility impairments are unable to meet the amount of physical activity that their physicians recommend due to factors like muscle weakness or excessive fatigue.

A [new study](#) in the *Journal of NeuroEngineering Rehabilitation* shows that the Myosuit -a light, soft robotic exoskeleton developed by the ETH Zurich spin-off MyoSwiss AG, supported by the NCCR Robotics spin-fund - can be easily incorporated into standard physiotherapy sessions, and can improve rehabilitation and exercise in patients with various gait conditions like spinal cord injury, stroke, multiple sclerosis, or muscle dystrophies.



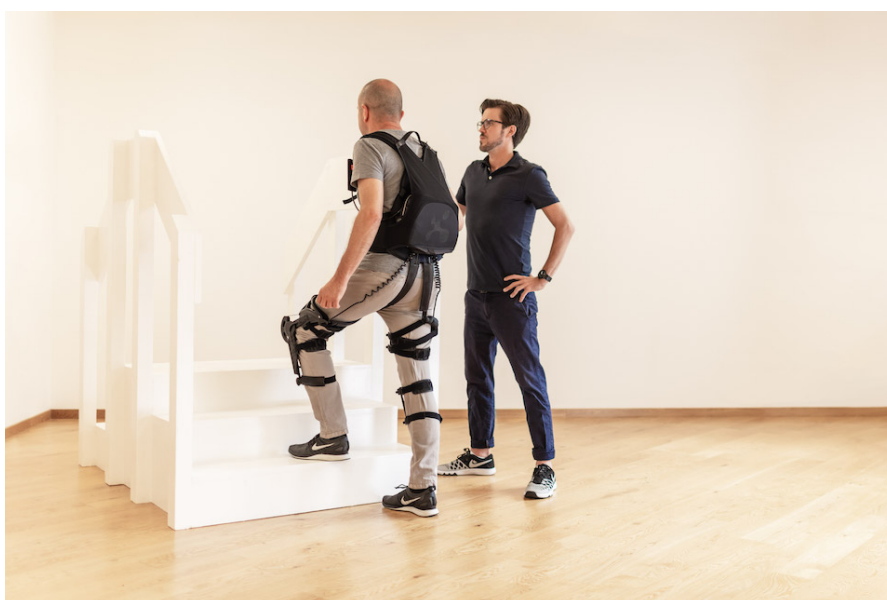
Deep Drone Acrobatics (RSS 2020)

“In this first clinical evaluation of the Myosuit, we set out to understand whether it could be used within the current way of doing physiotherapy. It is great for us to see that it fits well within the tight time constraints of a typical physiotherapy session. It was clear how the Myosuit facilitates the physiotherapists’ work” said Florian Haufe, the lead researcher in the study. “The therapist could easily switch between balance, strength, and endurance exercises while the patient wore the robot. The improvements we saw in walking speed motivate us to continue to explore the use of the Myosuit in people with various mobility disorders.”

A new exoskeleton concept

The Myosuit is a new approach to exoskeleton technology designed to support people with leg weakness. It supports rehabilitation training and activities of daily life such as walking, standing, sitting transfers, or stair negotiation. At just 5.5 kg and 6'200 Euro (6'950 CHF), the Myosuit is significantly simpler, lighter, and cheaper alternative to what is available on the market today. The robotic suit is powered by an exchangeable battery that lasts between 3 and 4 hours of regular use in a single charge; this makes the Myosuit completely untethered and autonomous.

For the head of the [Sensory-Motor Systems lab at ETH Zurich](#), Prof. Robert Riener, this work is of great importance. “We started to work on the concepts behind the Myosuit a few years back. It is very exciting for me to see how the technology has now made its way from my lab and into the market. Today, I see great promise in the Myosuit for improving physiotherapy training and soon, as a device that will change the lives of people with disabilities.”



This new study – by researchers from Riener’s research group, MyoSwiss, and the Spinal Cord Injury Center at the University of Zurich - shows how the Myosuit can be used safely and effectively in physiotherapy. The study involved participants able to get up from a chair and walk at least 10 meters without assistance from another person. A physiotherapist designed, for each participant, a 5-week exercise program that included exercises for balance, strength, walking, and functional tasks. All participants then took part in five training sessions, each lasting 45 minutes, while wearing the Myosuit.

Five out of the eight participants that completed the study improved their walking speed when using the Myosuit. The median improvement, across all participants, was 22%. This study shows how the Myosuit, a CE-marked medical device now commercialized by the ETH Zurich spin-off MyoSwiss, can improve physiotherapy training. Such technology holds great promise to enable patients with leg weakness to be physically active and meet the recommended levels of physical activity.

Literature

Florian Leander Haufe, Kai Schmidt, Jaime Enrique Duarte, Peter Wolf, Robert Riemer & Michele Xiloyannis, "Activity-based training with the Myosuit: a safety and feasibility study across diverse gait disorders", Journal of NeuroEngineering and Rehabilitation volume 17, Article number: 135 (2020)

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NCCR Robotics

The Swiss National Center of Competence in Robotics (NCCR Robotics) is a federally funded programme bringing together robotics laboratories from EPFL, ETH Zurich, University of Zurich, IDSIA, UNIBE, EMPA and University of Basel to work on wearable, rescue and educational robots.

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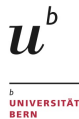
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