Virtual reality and rehabilitation robotics
Optimizing motor learning to improve neurorehabilitation

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Abstract

The possibility of using robotic devices and virtual reality to support rehabilitation training following brain injury is promising, since robots can deliver cost-effective and high-intensity training. Although there has been a significant effort to develop sophisticated devices to support arm rehabilitation, only a small number of these devices have been tested in clinical settings. Furthermore, to date, the benefits of robotic assistance seem to be limited to patients with severe impairment and better proprioceptive ability.

In this inaugural talk, I will put forward a new mindset that allows us to overcome many of the fundamental limitations of traditional approaches in stroke neurorehabilitation. I will present the new trends on rehabilitation robotics and immersive virtual reality, and will discuss how a better understanding of human skill acquisition can drive to improved neurorehabilitation approaches. I will show how our interdisciplinary group at the ARTORG Center together with clinicians at Inselspital are overcoming current limitations in neurorehabilitation employing cutting-edge technology.

Laura Marchal-Crespo is an SNSF Professor at the ARTORG Center for Biomedical Engineering Research, University of Bern. She obtained her M.Sc. and Ph.D degrees from the University of California at Irvine, USA, in 2006 and 2009, respectively. In 2010 she joined the Sensory-Motor Systems, ETH Zurich, as a postdoc researcher. In 2017, she obtained a Swiss National Science Foundation (SNSF) Professorship and joined the ARTORG Center for Biomedical Engineering Research. She carries out research in the general areas of human-machine interfaces and biological learning, and, specifically, in the use of robotic assistance and virtual reality to aid people in learning motor tasks and rehabilitate after neurologic injuries.

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17h at SITEM-Insel, O2.214
Freiburgstrasse 3

Apéro to follow directly

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