

## Scientific/Clinical Workshop

### Workshop Title

Digital Biomarkers and Prediction Models for Upper Limb Precision Neurorehabilitation after Stroke

### Workshop Responsible

Christoph Matthias Kanzler (Singapore-ETH Centre)

Olivier Lambercy (ETH Zurich)

### Speakers

Gert Kwakkel, David Reinkensmeyer, Joachim Hermsdörfer, Margit Alt-Murphy

### Attendee Engagement

One of the goals of the workshop is to sketch a roadmap for the clinical integration of technology-based assessments. This will be implemented through guided discussions that require active contributions from the audience, in addition to the involvement of all speakers. The presentations of all speakers will be kept rather short (max 10 min) such that sufficient time for the discussion round is available ( $\geq 30$  min).

### Abstract

Stroke is a common neurological injury with around 800 000 persons experiencing a stroke every year in the United States alone. Approximately 77% of stroke survivors are left with upper limb sensorimotor impairments, which negatively affect independence and quality of life and are therefore often a primary target during neurorehabilitation. In order to describe those impairments, track their temporal evaluation during recovery, and to predict rehabilitation outcomes, tools to accurately characterize upper limb sensorimotor impairments are necessary. Over the last decades, a strong focus of the research community has been on sensor-based technologies that provide objective, precise, and sensitive digital biomarkers of upper limb sensorimotor impairments in clinical and daily life environments. However, the validation and clinical application of those biomarkers as well as their integration into computational models predicting neurorehabilitation outcomes and influencing clinical decision making still remain challenging. Within this workshop on Digital Biomarkers and Prediction Models for Upper Limb Precision Neurorehabilitation after Stroke, we aim to revisit recent achievements in this promising field, identify and discuss remaining grand challenges, and propose a roadmap towards the clinical integration of such technologies.

The workshop will start off with a brief introductory presentation by the organizers that will give an overview of selected topic of the session and its importance, and present the featured speakers and how each of them links to the overall topic. Subsequently, high profile international speakers will provide brief scientific presentations. A large part of the session will be dedicated to an interactive discussion, also involving the audience. The goal of this is to sketch a roadmap towards the clinical integration of technology-based assessments in stroke neurorehabilitation.