



**Category:** Clinical Application of Technology, Lower Limb

**Workshop Title:** The Challenge of Tuning Robot-Assisted Gait Therapy to Patient's Individual Needs: What to Tune? That's the Question

**Workshop Organizer(s):** Cristina Bayón, Edwin van Asseldonk and Eduardo Rocon

**In person Speaker(s):**

- Tamburella, Federica, Foundation Santa Lucia;
- Van Dellen, Florian, University Children's Hospital Zurich
- Bulea, Thomas, National Institutes of Health

**Workshop Time:** 08:15 - 09:45

**Attendee Engagement:**

At the end of the workshop, we will have an interactive discussion with the audience and the speakers on a round table. In this discussion round, will participate speakers from different fields (industry, clinical, academia/research). Bringing together all stakeholders is crucial to further develop the field and really bring the technology to people.

Rather than being a collection of topics, this workshop is carefully structured in a way that the consecutive sessions allow the attendee to perceive the context and get a view of current solutions and future trends in such an exciting field.

**Abstract:**

Gait impairments resulting from neurological or motor disorders are a global societal problem. Over the last decades, we have seen rapid and extensive developments of robotic trainers and their controllers to enrich the rehabilitation of people, aiming to improve users' walking ability. The goal of robot-assisted gait training (RAGT) is to enhance the effects of functional training by providing increased therapy intensity and adaptive support in a controlled manner. However, after all these years of RAGT development, there has not been a definitive acceptance of robotic devices by the clinical staff.

One of the main problems that limits the maximum exploitation of RAGT is that the scientific community has not acquired yet sufficient knowledge to understand how robotic trainers may be optimally applied to maximize motor skill acquisition and relearning of lost functions. In short, how to optimally personalize the content of the treatment to the needs of the individual patient. This is a consequence of the extreme difficulty to understand and best tune the different combinations of robotic control parameters to tailor the therapy to desired gait changes.

In this workshop, we bring together experts from academia, industry and clinical centers, who will provide an overview of recent developments to optimally and automatically tune robotic control parameters, but even more important, also address the clinical experience of how to personalize these parameters depending on the desired functional goals.

At the end of the workshop these key elements will be addressed in an interactive discussion with the audience on a round table: What are the main challenges to apply RAGT in the clinic? How can we obtain desired aftereffects with tuning control parameters? Can we extend protocols to be

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applicable to different robotic devices?... Together, we will provide a better understanding on the optimal choice of control parameter settings to match training goals