REHABWEEK 2025

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Category: Development of Technology

Workshop Title: Involving Users to Increase Impact of Wearable Robots: Welcome to our World Café!

Organizer(s): Gerdienke Prange

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Workshop Time: 10:30 - 12:00

Attendee Engagement: After illustrating how user involvement can benefit the development and market entry process of a wearable soft-robotic glove, the majority of the time is spent involving all workshop participants in an interactive exercise about an approachable way to involve users. Workshop participants will join actively in impact assessment of example WRs from perspective of different stakeholders using the World Café methodology. Using this method, participants move from one table to the next in the 'café'. The table is ideally set with tablecloth, a vase with flowers, etc. and has paper, coloured pens and sticky notes. At each table, participants will engage in group discussions on the impact of an example WR case, each time from the perspective of a different stakeholder.

The World Café in this workshop will be structured in 2 rounds of 30 minutes, focused on two different WRs in development as use cases (a wearable exoskeleton for the upper extremity; and a soft exosuit for the lower extremity). Each round starts with a concise description of the use case, by presenting the WR and its target population shortly (5 min). For easy reference during the World Café rounds, a poster with the WR description is put up, and placed in 'menu style' on the tables as well. Next, participants will be invited to join whichever of 5 tables during the next 20 minutes. Each table represents a different stakeholder (patients, technology developers, healthcare professionals, caregivers, health insurers). At each table, participants will engage in conversation about the benefits and challenges of the WR for the stakeholder group. Ideas emerging in the conversation are written down in an open format on blank paper, writing key words and phrases, drawing images and symbols, linking concepts or as separate ideas. During 20 minutes, participants can stay at one table or visit multiple tables, joining in conversation as they drop in and out. This process is repeated in the second round with the other WR. Afterwards, the most prominent insights about the World Café methodology and emerging views on user involvement during impact assessment are shared and discussed (10 minutes) in the large group.

Using this hands-on World Café approach, workshop participants learn how to apply this method as a simple and effective format to involve users in their own projects, and how to adapt it to the context of research and development of wearable robots. In this way, they experience

how involving users in impact assessment early in the development stage can benefit the development process and can be used to refine their business case.

Abstract: Advances in (soft) robot technology are bringing applications of wearable robots (WR) ever closer to clinical practice and daily life of its users. Knowing who those users are, what they need and how use of WR fit into daily life is essential to move from research to clinical practice. Therefore, user involvement in research and development of robot technology is essential, but this is easier said than done. User involvement aimed at improving chances for real-life adoption of WR doesn't stop at identifying user requirements. It entails involving users iteratively during various stages of device development and device evaluation, adapting the process based on the outcomes [1]. How to do this, practically? What does it really yield? Common questions, but often left unanswered.

In this workshop, we will give pragmatic guidance about user involvement during development of various WR, and its potential benefits. We will start by illustrating how users were involved during development of a soft-robotic glove over multiple years and how its outcomes [2] have shaped exploitation opportunities for powered bracing towards the market, from both manufacturer and researcher point-of-view (30 min). Next, the audience will participate in a very accessible and effective method to elicit user input, the World Café. Two other WR, which are currently in development, are presented as applications: a wearable exoskeleton for the upper extremity (WillPower) and a soft exosuit for the lower extremity (SWAG) [3]. Participants will consider the impact of those WR from the perspective of different stakeholders to showcase the potential of the World Café methodology. This is concluded by a plenary discussion harvesting main insights about user involvement approaches and the World Café method as a specific example, and outline its potential benefit to the workshop participants.