



Scientific/Educational Workshop

Workshop information

Workshop responsables :

Gionata Salvietti
W Zev Rymer
Edwin van Asseldonk
Philipp Beckerle
Ramazan Unal
Fulvio Mastrogiovanni
Jan Veneman
Simona Crea

Workshop title :

Towards a next generation of wearable robotic devices for human-oriented assistance and therapy

Workshop goals :

The workshop aim is to gather knowledge from robotic engineering, clinical studies, human-robot interaction and psychology with respect to human-oriented approaches in assistive and rehabilitation robotics, with a particular focus on novel wearable devices. We will leverage on the experience with rehabilitation robotic trainers to show that improvements in motor performance have been relatively modest so far and to propose alternative approaches based on human studies and new wearable robots.

Abstract :

This workshop is the result of the merging of three workshop proposals that shared common topics for assistive and rehabilitation robotics. The workshop will gather knowledge from robotic engineering, clinical studies, human-robot interaction and psychology. The invited speakers and the intended audience are intentionally meant to be multidisciplinary in nature, to discuss the topics from these different perspectives.

Assistive and rehabilitation robotics are receiving increasing research interest, due to their capabilities in evaluation, augmentation, and their high repeatability. Even though designs have the functionality for desired tasks, many robotic interventions suffer from being effective not only due to the limitation in technology but also the insufficient knowledge about the human-machine interaction. Traditional actuators are mostly developed for accurate position control, but in human robot-interaction other control targets prevail, posing different demands on

actuators. Developing intuitive control strategies that are effective for controlling wearable robots in scenarios of daily life or functional rehabilitation is still a big challenge.

To tackle this issues, both assistive and therapeutic rehabilitation robotics research and application require human-oriented approaches, since the devices routinely incorporate interfaces with humans. Moreover, current objectives for the use of therapeutic rehabilitation robots derive primarily from established physical and occupational clinical protocols. However these protocols provide limited guidance about precise details of imposed motion, such as speed of desired motion, applied forces, or resulting movement kinetic and kinematic profiles. Ultimately, the choices made for robot training are inherently arbitrary, and not based on any rigorous theory of how best to relearn impaired voluntary movements.

Confirmed Speakers:

Arun Jayaraman
Jim Patton
Giulio Rognini
Jaap Burke
Connor Walsh
Elliott Rouse
Cor Meijneke
Lorenzo Masia
Marcia O'Malley
Domenico Prattichizzo
Pierre Barralon
Emily Cross
Juergen Konczak