Category: Development and Implementation of Technology

Workshop Title: Human Modeling in Rehabilitation Robotics

Workshop Organizer(s): Giacinto Barresi

In person Speaker(s):

- Barresi Giacinto (organizer), Istituto Italiano di Tecnologia (IIT), Genoa (Italy);
- Tessari Federico (organizer), Massachusetts Institute of Technology (MIT), Cambridge (Massachusetts, USA);
- De Michieli Lorenzo, Istituto Italiano di Tecnologia (IIT), Genoa (Italy);
- Muraki Satoshi, Kyushu University, Fukuoka (Japan);
- Pizzolato Claudio, Griffith University, Brisbane (Queensland, Australia);
- Holmes Michael, Brock University, St. Catharines (Ontario, Canada);
- Ang Wei Tech, Nanyang Technological University, Singapore (Singapore);
- van der Kooij Herman, University of Twente, Twente (Netherlands);
- Castellini Claudio, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen (Germany)

Workshop Time: 10:30 - 12:00

Attendee Engagement:

The organizers will lead the group constituted by the speakers and the audience in the task of performing a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) on the adoption of the described approaches in patient modeling, spanning from their clinical impact to technological feasibility and ethical legitimacy. This activity will be conducted as a focus group session, using both physical and digital blackboards. Special attention will be paid to the educational value of the discussion for the students attending the workshop.

Abstract:

The adoption of novel rehabilitative and assistive technologies still faces significant challenges, mostly due to the difficulty of meeting user needs. This complex challenge encompasses the neurocognitive and biomechanical processes underlying the patient's experience and behavior. Advantageous strategies to advance in this area require a continuing effort to mathematically model the patient for improving their interactions with any intelligent machine designed to aid recovery of their motor skills. The goal of this workshop will be to update the audience of researchers, clinicians, and developers on these topics. After a brief introduction, 9 researchers (organizers and invited speakers) will describe effective and efficient solutions to represent patients interacting with rehabilitative and assistive robots according to a tri-lateral vision (evidence-based, model-based, digital-based). Such a holistic perspective may lead to novel frameworks for precision medicine including human-centered robots able to provide personalized and adaptive treatments.