Scientific/Educational Workshop

Workshop title

Autonomy and Intelligence in Robotic Rehabilitation and Assistive Technologies

Workshop responsible
S. Farokh Atashzar (Imperial College London)

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Speakers
Dario Farina (from Imperial College London, UK);
Etienne Burdet (Imperial College London, UK);
James Patton (University of Illinois at Chicago, USA);
Robert Riener (ETH, Switzerland);
Marcia K. O'Malley (Rice University, USA);
Patrick M. Pilarski (University of Alberta, Canada);
Naaz Desai (University of Toronto, Canada)
Mahdi Tavakoli (University of Alberta, Canada)
S. Farokh Atashzar (Imperial College London, UK)
Vivian K. Mushahwar (University of Alberta, Canada)

Workshop goals
This workshop aims to bring together the most recent developments in the field of intelligent and autonomous robotic rehabilitation and smart assistive technologies for people living with sensorimotor disabilities. The workshop will include 25-minute lectures by the leading groups in the field in addition to round-table discussions and poster presentations. Posters will be reviewed by the technical committee of the workshop, and accepted posters will be presented as part of the workshop.

Abstract
Robotic technologies have revolutionized the field of motor rehabilitation and have been successful in accelerating neural recover and motor restoration. In addition, robotic systems have been successfully utilized in the past decade to augment motor capabilities of disabled people to perform activities of daily living. Although robots have shown a great potential for delivering rehabilitation and assistance, there is a need to make the technology (a) more adaptable to and compatible with the variable biomechanical characteristics of the user, (b) more responsive to the intended movements, and (c) more intelligent in delivering therapy and assistance. This has led to active lines of research in the fields of robotic rehabilitation, assistive prosthetic technologies and bio-signal processing. Motivated by the above, this workshop aims to report on the most recent developments in the field. The workshop will cover a broad range of related subjects including (but not limited to) machine learning, artificial intelligence, smart autonomy, bio-signal processing, modeling and control, and instrumentation for advanced human-machine interaction in rehabilitation and assistive systems.

Specific topics of interest are:

- Autonomous and intelligent robotic rehabilitation;
- Advanced functional electrical stimulation for motor restoration;
- Intelligent active prosthetic devices;
- Machine learning for augmented therapy and assistance;
- Bio-signal processing for intelligent rehabilitation and assistance;
- In-home rehabilitation