rehabweek
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REHAB WEEK 2017
17-20 JULY 2017, LONDON, UK

Scientific/Educational Workshop

Workshop information

Workshop responsibles :
Sunil K. Agrawal
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Workshop title :
Wearable Technology for Gait Assessments in Healthy Individuals and Patients with Movement Disorders

Workshop goals :
This workshop will discuss emerging applications of footwear-based gait analysis systems, related challenges, and potential future directions. We aim to stimulate discussion among researchers on challenging topics, such as: strategies to improve accuracy, precision and reliability in long-term measurements; machine learning methods for activity classification; algorithms to segment and process large datasets, and assessments of diverse motor tasks.

Abstract :
Following the advent of miniaturized and relatively inexpensive inertial sensors, the last decade has seen a rapid increase in the number of wearable gait analysis devices. Compared to traditional laboratory equipment, these devices are more affordable and versatile. They can be used to assess patients' gait in unrestricted environments, in diverse motor tasks, and over extended time periods.

Footwear-based systems are more suitable for clinical and day-to-day use than full body and lower body systems because of their compact design, lower cost, and faster donning/doffing time.

Additionally, footwear-based systems can take advantage of the dynamics of human locomotion to compensate for sensor drifts, which allows higher levels of accuracy.

This workshop will provide an overview of the recent advances in footwear-based systems used in these applications:
- clinical gait assessments
- fall risk assessment/detection
- gait/balance rehabilitation using real-time feedback
- activity monitoring and classification
- sport performance
- emotion rendering/monitoring
- pedestrian navigation
- energy harvesting

Invited speakers will also discuss key technical challenges, proposed solutions and open problems, such as:

- approaches to improve accuracy and precision of gait assessments, especially at faster gait pace
- novel sensors to enrich the set of measured spatiotemporal gait parameters
- efficient algorithms to segment and process large amount of data
- machine learning methods for activity classification in large datasets
- potential for future longitudinal studies in the real-life scenarios

This workshop is primarily addressed to young researchers, professional researchers, clinicians and technology experts who are interested in wearable technology. Participants will get in touch with other colleagues in the field and they will have the opportunity to improve their knowledge through the talks given by world renowned experts.

Speakers:
Lorenzo Chiari, *"Handling Gait Impairments of Persons with Parkinson's Disease by means of Wearable Real-Time Biofeedback"*
Angelo Maria Sabatini, *"Ambulatory Assessment of the Pelvic Motion Using Inertial Sensor Measurements"*
Samer Mohammed, *"Gait Characterization for Mobility Assistance Using Wearable Robots"*
Nicola Vitiello & Simona Crea, *"Design of a Multi-Channel Sensorized Insole and its Applications in Wearable Robotics"*
Sunil Agrawal & Damiano Zanotto, *"Gait Assessment Using SoleSound Instrumented Footwear"*