Workshop on new multi-sensor devices for remote management of disease

IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems
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Abstract

Nowadays sensor miniaturization and MEMS development allow acquiring a great quantity of data. Innovations at system level and at component level allow the development of new systems for remote management of diseases, treatment and rehabilitation, outside hospitals and care centres.

In particular, technological progress and new advanced data processing techniques open new perspectives for exploring new applications with infants and children. Through artificial sensors and advanced signal processing human sensing and diagnostic capabilities can be extended. Indiscernible or unstructured information about the child's interaction with the environment can be translated to a form that clinicians can immediately understand and interpret. This requires new methods for multisensory fusion, integration, action recognition and interpretation as well as extrapolation of results.

Neurodevelopmental engineering is a new interdisciplinary research area at the intersection of developmental neuroscience and biomedical engineering, mainly concerned with quantitative analysis and modelling of human behaviour during neural development.

Main application fields of Neurodevelopmental Engineering are: new clinical protocols and standards for early diagnosis, functional evaluation and therapeutic treatments of neuro-developmental disorders and new generations of educational, interactive multi-sensor toys which can provide adequate stimuli and guidance for supporting the physiological neurodevelopment process.

The workshop aims at showing some results in this field and also at giving an updated view of the techniques for sensory integration that could be used for personal health systems.

Topic areas of this workshop include, but are not limited to:

- Neuro-Developmental Engineering;
- New technologies for assessment and diagnosis;
- Inertial sensors and Sensor fusion;
- Child's action recognition;
- Child's behaviour classification
- Models for child's progress assessment

Organizers:

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Workshop programme:

Time	Speaker	Affiliation	Topic
10.20-10.30	Welcome and introduction (Francesca Cecchi)		
10.30-11.10	Francesca Cecchi	The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa	*CareToy Project* multi-sensor toys for infants' rehabilitation at home
	Matjaz Mihelj	University of Ljubljana, Slovenia	
11.10-11.50	Silvio Bonfiglio	FIMI Srl, a Barco Company, Saronno, Italy	*MICHELANGELO project* an European research project exploring new, ICT-supported approaches in the assessment and treatment of autistic children
11.50-12.30	Prof. Veltink	Faculty of Electrical Engineering, Mathematics and Computer Science EEMCS Research Institute for Biomedical Engineering and Technical Medicine MIRA University of Twente	INTERACTION Sensing daily-life physical interaction with the environment after stroke
12.30-13.30	Lunch Break		
13.30-14.10	Manuel Ferre Prof. Titular	Centre for Automation and Robotics (CAR UPM-CSIC)	*CogWatch project* Hand tracking system based on Kinect for cognitive rehabilitation".
14.10-14.50	Sergio Jurado	Sensing & Control Systems, Barcelona, Spain	*ARMOR project* Advanced multi-paRametric Monitoring and analysis for diagnosis and Optimal management of epilepsy and Related brain disorders
14.50-15.00	Conclusions (Matjaz Mihelj)		