Scientific/Clinical Workshop

Workshop Title

Serious Games and Wearable Technologies in Adaptive Rehabilitation of Pediatric Population

Workshop Responsible

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Speakers

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Abstract

Rehabilitation is essential, along with prevention, promotion, treatment, and support, in addressing the full scope of health needs of a population, ensuring healthy lives and promoting well-being for all at all ages. This becomes particularly true in the pediatric population, where neuromotor impairments, causally and clinically heterogeneous, occur in a challenging developmental context.

Coordinated and concerted action is then needed to scale up rehabilitation services and address the profound unmet needs that exist. Medicine is moving away from a "one size fits all" mentality, thus the main objective of future rehabilitation methods is to tailor the therapy to the patient, based on its phenotypic characteristics and the evolution of treatment response.

Virtual Rehabilitation exercises have been widely proposed as an effective method for modern rehabilitation settings, often coupled with robotic or wearable assistive devices. The virtual exercise offers flexibility in parameterization, straightforward communication with sensors and devices, and a source of recorded data already synchronized with the proposed tasks. Furthermore, the serious game approach adds the precious opportunity to engage the patient in the exercises, whereas active participation in the exercise is crucial in certain rehabilitation fields, such as neurorehabilitation. Here, brain plasticity has to be stimulated by the active execution of the motor task.

This workshop stems from the TELOS Project and it aims to gather knowledge and foster research interest into wearable devices for biosignals collection and serious games applied to rehabilitation scenarios. The opportunity and challenges are to adopt powerful novel technologies in the field of wearables, sensing and immersive virtual environments, and to develop novel methods for implementation of advanced virtual exercises in terms of engagement, proposed tasks, data analysis and feasibility of the system in the clinical setting.