



Scientific/Educational Workshop

Workshop title

Home-based Technologies to Assess and Treat Motor Impairment in Individuals with Neurologic Injury

Workshop organizer

Peter Lum (Catholic University)

Speakers

Peter Lum,
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Alexander Dromerick,
Kevin Cleary,
Manon Schladen,
Sally Evans

Workshop goals

The Goals are to:

- 1) Present the state of the art in home-based technologies for rehabilitation;
- 2) Disseminate progress from a just-funded Rehabilitation Engineering Research Center (RERC) on this topic;
- 3) Provide hands on demonstrations of the technologies being developed by the RERC.

Abstract

This workshop will present ongoing work from a NIDILRR-funded RERC on home-based technologies for motor rehabilitation after neurologic injury. Rehabilitation has evolved from compensation for impairment to goals of recovery through neurorehabilitation. Treatment and assessments are done predominantly in the clinic by therapists. However, home-based technologies can have a large impact by providing tools to augment clinic-based delivery with assessments that are more valid and treatments that are less expensive, more convenient and potentially more effective. Progress from six projects will be presented. Project D1 is developing wearable upper extremity exoskeletons that can be integrated into activities of daily living for individuals with stroke. Project D2 is developing an ankle-based mechanical platform combined with video games for home-based rehab of children with cerebral palsy. There are no clinically-accepted, objective methods of assessing spontaneous use of impaired limbs in the home and community. Project R1 is tracking sensorimotor development and developing predictive models of future outcomes in infants at risk for motor delay using home-based video and specially designed toys that provide novel sensory feedback. Project R2 is studying machine learning algorithms and wrist worn accelerometry for objectively measuring the amount of functional arm use in persons with stroke. Project R3 is using VR and behavioral models to investigate factors that affect the everyday choices made by persons with stroke to either use an impaired upper extremity or compensate with the opposite limb. Project D3 is exploring the patient and caregiver perspective on these home-based technologies and developing guidelines and best practices for how to translate all these technologies into the home. Prototypes of the technologies under development will be available for hands-on demonstrations.