training and monitoring of daily-life physical INTERACTION with the environment after stroke

Von 2011-11-01 bis 2015-01-31, Abgeschlossenes Projekt | INTERACTION Website

Ziel

Continuous daily-life monitoring of the functional activities of stroke survivors in their physical interaction with the environment is essential for optimal guidance of rehabilitation therapy by medical professionals and coaching of the patient. Such performance information cannot be obtained with present monitoring systems. It is the objective of the INTERACTION project to develop and validate an unobtrusive and modular system for monitoring daily life activities and for training of upper and lower extremity motor function in stroke subjects. The system will be unobtrusively integrated in clothing (e-textile), include fabric-based and distributed inertial sensing, and provide telemonitoring and adaptive on-body feedback capabilities. Telesupervision facilities will enable a clinical expert at a distance to evaluate performance effectively, coach the patient and influence training. Monitoring will be based on ambulatory sensing of muscle activation (EMG), interaction forces and body movements. The physical interaction with the environment during reaching and grasping will be assessed by relating interaction forces and movements. This provides information about power exchange between the human body and the environment, dynamics of the environment and task performance. Balancing the body will be assessed from ground reaction forces and relative foot placements. EMG provides information about neural control of movements, including abnormal synergies and spasticity. The assessment is made context aware by task identification and estimation of the dynamics of the environment from the sensed quantities. The system will first be validated in a lab setting, comparing the system against current clinical measures. It will subsequently be demonstrated during the actual daily life of stroke survivors.
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Zuletzt geändert am 2017-04-21
Abgerufen am 2019-09-23

Permalink: https://cordis.europa.eu/project/rcn/100699_en.html
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