Bachelor / Master – Thesis

Kinematic analysis of everyday activities - a methodological comparison of motion capturing and actigraphy

In recent years, the interest in automated methods of real-time, unobtrusive monitoring of ambulation, activity and wellness has steadily increased. Thus, the analysis of such data has been subject to a phlethora of intense research projects including the development of feasible algorithms that are required to translate such measurements into clinically relevant markers.

Until now, the analysis of activities of daily living (ADL) performance was limited to subjective scoring and timed trials – which are both valid but bound to a lab setting and are time consuming. The next step, the quantification of performance in terms of motor capacity and cognition, is necessary in order to assess, assist and enable elderly in everyday activities.

Methods:

Motion capturing system; ActiGraph wGT3X-BT

Question:

The main objective of this project is to evaluate which kinematic parameter are most useful to assess ADL capacity comparing motion capturing with actigraphy
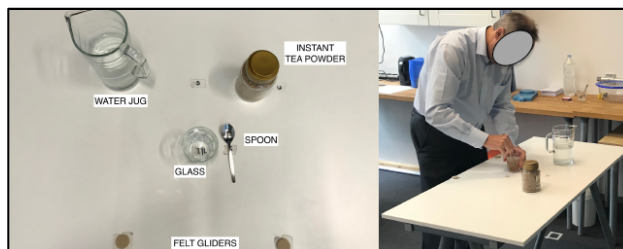

Fig. 2: left: setting of the ADL task „tea making", right: an older participant executing the tea making task in the lab

Information/Literature:

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Gulde, P., Hermsdörfer, J. (2018). Smoothness Metrics in Complex Movement Tasks. Frontiers in Neurology (9), p. 615.

Gulde, P., Schmidle, S., Aumüller, A., Hermsdörfer, J. (2019). The effects of speed of execution on upper-limb kinematics in activities of daily living with respect to age. Experimental brain research, 237(6), pp. 1383-1385.

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Fig. 1: left: ActiGraph, right: qualsis motion capturing camera