Socially Assistive Robots in Eldercare – Interaction Design for varying Levels of Automation

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This research aims to contribute to the design of the interaction between older adults and their assistive robots by investigating adaptive levels of automation (LOA), the feedback that the robots provide to their users, and the interaction between these two constructs across various assistive robot use cases.

A model was proposed to integrate LOA with the robot's levels of transparency (LOT) to keep older adult users active and engaged with the robot while being informed on the behaviour of the robot at any given time. The experimental testbeds utilized to empirically evaluate the research design consisted of: a person following task with a mobile robot, table setting task with a robotic arm and a hazard detection at the home task with a telepresence robot.

Results from the experiments in the human following and table setting use cases revealed that older adults tend to be more interactive when the LOA is low compared to situations with high LOA. There were also similar interaction effects of the LOA and LOT in the other measures assessed such as fluency of interaction, understanding, comfort and trust of the users.

Based on the outcome of the studies, it is recommended that lower LOA should be combined with higher LOT, to keep older adults adequately informed. It is also recommended to maintain the LOT at a low level if a high LOA is utilized, to reduce information overload on the older adults. Evaluation of the influence of the automation and transparency levels on the quality of user-robot interaction with the telepresence robot is ongoing and some of the emerging results will also be presented.

Lastly, in my talk I will discuss the potential for improved interaction design when implementing LOA-LOT design principles in socially assistive robotic applications for older adults. This is one of the research projects in the EU HORIZON 2020 SOCRATES project (http://www.socrates-project.eu/) focused on robotics in eldercare.