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Supporting medication intake of the elderly with robot technology

Fokie Cnossen¹, Nikie Sweers¹ & Amir Shantia¹,²

¹Institute of Artificial Intelligence & Cognitive Engineering, Faculty of Mathematics and Natural Sciences, University of Groningen (f.cnossen@rug.nl)
²Enacer BV, Groningen (enacer.nl)

Shortest Summary

- RITA is a robot to assist the elderly in daily activities.
- We developed and evaluated an interface for RITA:
  - to remind elderly about medication intake
  - on a touch screen
- The main findings were:
  - users understood the interface
  - users were able to take medication with the touch screen support
  - many were unable to perform slightly more advanced functions
- The main conclusions / recommendations were:
  - interfaces should be as simple as possible
  - usability tests should be routine in developing health technology for the elderly

Background

- Medication intake can prove to be a complicated task for the elderly.
- Roughly 50% of all prescribed medication is taken incorrectly (MacLaughlin et al., 2005).
- Simplification of this task might have beneficial effects on this group’s general health and society’s healthcare costs.
- Together with Enacer Company we developed an assistive robot for the elderly, called RITA (the Reliable Interactive Table Assistant).

Design Process

Interviews with caregivers

Main result:
- It is especially important to check whether the elderly actually take their medication

Focus group of elderly

- Feedback on the clarity of the design
- Requirements analysis

Main result:
- Font size should be increased for optimal utility

Interface development

- The interface was developed in HTML5

User study

Usability test of the interface on the touch screen
- Subjects were asked to perform a number of tasks related to the intake of medication
  - Basic task: supervision of medication intake
  - More advanced functions: change settings
- Acceptance questionnaire

Aim of the Study

- To develop a robot interface to assist the elderly with their medication intake.
- To investigate whether the target group is willing to accept medication intake assistance from a robot

Medication Intake Interface

The Robot RITA

- RITA is an intelligent, moving wooden table
- Accompanies people in their own home
- Assists in activities of daily living
- RITA continuously monitors the client
- RITA analyzes behavioral patterns to detect uncommon situations
- RITA helps health care personnel to check the situation
- RITA can serve food and drinks to clients and visitors
- RITA functions autonomously
- Clients have no need to give direct orders to RITA; RITA will already know what to do.
- RITA can be operated directly by using the touch screen on the front of the robot.
- RITA was designed to blend in with existing furniture and not to stand out
- It does not have a futuristic look but is instead a wooden table.
- Market research has shown that older people appreciate the classic look.
- RITA supports health care professionals to make sure they are able to provide their clients with maximum comfort and quality of life-relieving them of certain repetitive tasks and asking them in more complex tasks.

Main Results of User Study

Usability Test

- The majority of participants in this study (17 out of 19) were able to take their medication with assistance of the interface.
- Participants found it difficult to work with more advanced interface settings.
- Setting notifications interval.
- Changing pharmacy’s contact details.
- Post-Study Usability Questionnaire (Lewis, 1992). Mean score of 3.9 (between ‘Neutral’ and ‘Agree’).

Robot Acceptance

- Robot Acceptance Questionnaire (Likert 5-point scale).
- User accepted help from the robot.
- Mean score of 3.5 (Neutral).

Conclusions & Recommendations

Conclusion

- The basic functionality of the interface was easy to use for the elderly for assistance with the medication intake task.
- Elderly are willing to accept assistance of a robot with this task

Recommendations

- Interfaces for the elderly should really be as simple as possible.
- Testing of usability aspects during the design process is vital for a well-designed robot.

References