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

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 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.

BACKGROUND

- Medication intake can prove to be a complicated task for the elderly.
- Roughly 50% of all prescribed medication is taken incorrectly (McLaughlin, 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

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 (Likert 5-point scale)
  - Users rated usability positively
  - 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

