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.

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

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 ('Agree')

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


