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Supporting medication intake of the elderly with robot technology

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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
• 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

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 analyses behavioral patterns to detect uncommon situations
• alarms 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 adding 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 (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)
• Users 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


