



ottobock.

**H**ELLA  
Automation



HAUS DER BARMHERZIGKEIT  
AKADEMIE FÜR ALTERSFORSCHUNG

# HOBBIT

Alexandra Schmid

*Academy for Ageing Research at Haus der  
Barmherzigkeit*

[www.hobbit-project.eu](http://www.hobbit-project.eu)

# The Mutual Care Robot



Hobbit

# Facts of the project



- EU-funded project within the **7th Framework Programme**.
- **Duration** planned:  
11/2011 – 10/2014 (3 years )
- **Cooperative Project with 6 Partners:**
  - Lund Universität (SWE)
  - Metralabs GmbH (GER)
  - Technische Universität Wien (AT)
  - Akademie für Altersforschung am HB (AT)
  - Hella Automation GmbH (AT)
  - Foundation for Research and Technology Hellas (GR)

# Challenges when we get older

- Strong growth of population of old people
- Wish to be independent of ageing persons
- **Falls and their consequences** are main reason for moving to a care facility

Senior citizens: At least one fall per year

> 65 years ..... 30% (N=440,000)

> 80 years ..... 50% (N=207,000)

> 65 years > 50% of hospital visits due to falls  
14.000 fractures of thigh bones per year



# Consequences of falls depend on post event management...

- Problem of **undiscovered falls** (often for several hours), because the person cannot call for help
- **Consequences:**
  - Hypothermia
  - Dehydration
  - Crush Syndrom ... kidney insufficiency
  - Infections and other complications



**~3 hours limit:**  
otherwise more severe complications

# How to support older people staying autonomous at home?

- Increase perceived safety by:

- Physical presence ...

... with:

- Focus on fall prevention
- Focus on fall detection
- Good emergency management



# Challenge

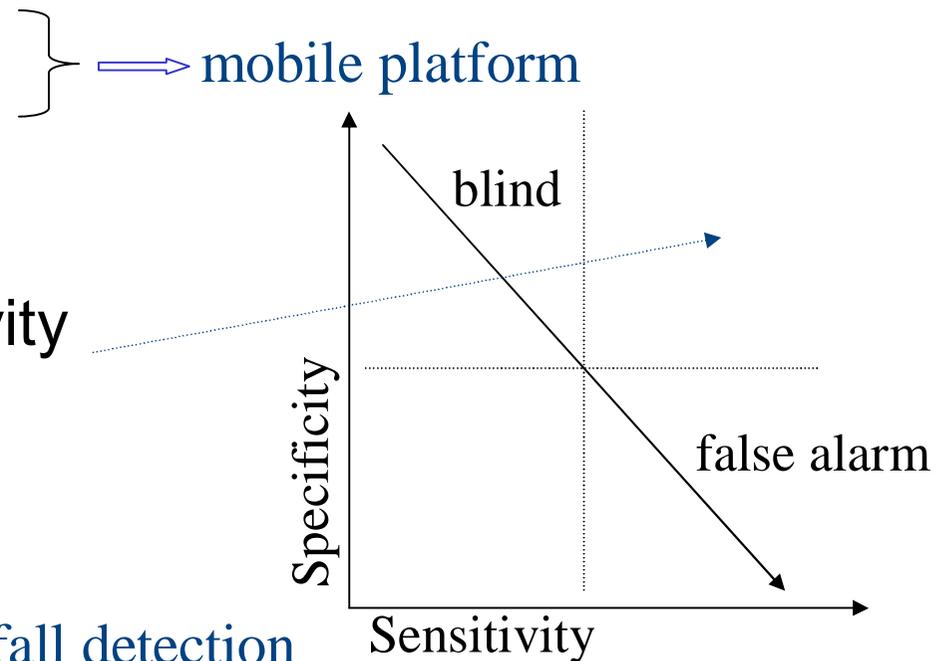
- **Lack of acceptance due to:**

- Stigmatisation
- Fear of something new
- General scepticism about technology
- High installation effort in homes with high costs
- High error rate
- Low frequency of falls



# User requirements

- Little effort of installation
- Not worn on the body
- Usability
  - high specificity and sensitivity
- Dialogue, hand shake mode
- High acceptance by users
  - Everyday life benefit: not ,just‘ fall detection
- Affordability – reasonable costs
  - Long term goal <5000 Euro



# Target User Groups

|   |  |
|---|--|
| <b>Primary users</b><br><br><b>PU</b>   | <ul style="list-style-type: none"><li>• 75 plus and living alone</li><li>• Age-related moderate impairments (recruitment criteria)</li><li>• Possibly receive home care, help in household</li></ul>                       |
| <b>Secondary users</b><br><br><b>SU</b> | <ul style="list-style-type: none"><li>• Regular contact with primary users (relatives, caregivers, ...),</li><li>• person to call</li><li>• Familiar with user reactions (user trials)</li><li>• Actual customer</li></ul> |

# HOBBIT: User-driven Approach

## **Methods for user requirement assessment iterative process:**

- Workshops with experts and primary and secondary users in Austria and Sweden
- Questionnaire survey: ~ 150 persons from the target group (in Austria, Sweden and Greece)
- Qualitative interviews (in Austria, Sweden and Greece)  
6 primary users and 3 secondary users per country
- Prototype 1 trials (16 PU and 8 SU per country)
- Prototype 2 trials (planned with 8 PU and 4 SU per country)

# PU-Workshop with a Creative Approach

Collecting favoured traits:

→ Picture associations

→ Survey of favoured materials, design issues (colour, shape, size), kind of movement, gender,...



# SU-Workshops with a Creative Approach

- Picture association



- Designing mock-ups



# Prototype 1

- Tests altogether with 49 PU (AAF, FORTH and LUND)
- focus on usability, acceptance and Mutual Care aspects and affordability
- Example performed at AAF:



© Haus der Barmherzigkeit/APA-Fotoservice/Pauty

# Lessons Learned for PT2

- Technical: **faster** task execution
- **Design:** - Robot size should be smaller
  - Better position of tray
- **Affordability:** not buying but renting
- **Reminders** (medication, appointments, drinking)
- **Personalised robot** behaviour, profile settings
- **Mutual Care Mode:** concludes to a bonding mechanisms
  - Increases perceived **usability** of the robot (e.g., ease-of-use)
  - Increases **reciprocity** in the interaction (helper/helper)

# Mutual Care – Added Value

- **Mutual Care Definition:**
  - Creation of a bi-directional helper/helped situation between human and robot
  - Socially the robot is a helper that needs help from the user
- ... can only be **implicitly tested**
  - PT1 user trials: Mutual Care (MC) vs. Control Group (CG)

# Mutual Care Lessons Learned for PT2

- PT1 showed human – robot reciprocity
- PT2 wants to test if there is long term reciprocity
- Verify long-term effect of MC
- Hypothesis: MC increases self-efficacy of user (perceived self-competence to accomplish daily tasks) and bonding

# Thank you for your attention!

