HOBBIT

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www.hobbit-project.eu
The Mutual Care Robot
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

Source: K. Hager, J. Briggs, H. Jansenberger, Statistik Austria
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

**Primary users**

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<td>• 75 plus and living alone</td>
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<td>• Age-related moderate impairments (recruitment criteria)</td>
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<td>• Possibly receive home care, help in household</td>
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**Secondary users**

<table>
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<td>• Regular contact with primary users (relatives, caregivers, …),</td>
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<td>• person to call</td>
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<td>• Familiar with user reactions (user trials)</td>
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<td>• Actual customer</td>
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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:
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/helpee 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!