HOBBIT – Towards a Robot for Aging Well

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Demographic Challenge

• Strong growth of population of old people
• Wish to be independent
• **Fall** is main reason for moving to a care facility
• At least one fall per year (in Austria, 8M people)
  – Senior citizens > 65 years ........ 30% (N=440.000)
  – Senior citizens > 80 Jahre ........ 50% (N=207.000)
• Direct consequences of a fall
  – Citizens > 65 years: > 50% of hospital visits due to falls
  – 14.000 fractures of thigh bones per year
  – 3 hours limit: otherwise more severe complications
Automatic Fall Detection

• Different sensors
  – Installation in home
    …. high installation costs
  – On the person
    …. limited acceptance

• Conflict of goals
  – Sensitivity
    (no false alarms FA; = TP / (TP+FA))
  – Specificity
    (no false positivies FP; = TA / (TA+FP))
HOBBIT – A Pragmatic Approach

• HOBBIT puts user in centre of all design issues

• Approach: Mutual Care
  – User needs help from robot
  – Robot imperfect: user helps
    • E.g., learn favourite objects of user
    • E.g., open doors for robot

• And develops the needed technology
Robot: closing the gap but no replacement of personal care

Haus der Barmherzigkeit

Haus der Barmherzigkeit
HOBBIT: User–driven Approach

- User workshops
  - A, S, Gr
- Emphasis on Mutual Care paradigm
  - User helps robot
  - Robot helps user

<table>
<thead>
<tr>
<th>COMMANDS &amp; SERVICES</th>
<th>PRIORITISATION of the users (D1.2)</th>
<th>PRIORITISATION Considering Mutual Care implementation</th>
<th>PRIORITISATION</th>
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<td>Call friend</td>
<td>1</td>
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<td>1-</td>
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<tr>
<td>Surprise me</td>
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<td>+</td>
<td>1+</td>
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<td>Play Games</td>
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<td>Go recharging</td>
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<tr>
<td>Follow Me</td>
<td>2</td>
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<tr>
<td>Bring Object</td>
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<tr>
<td>Pick up Object</td>
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<tr>
<td>Learn Object</td>
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<tr>
<td>Call robot</td>
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<td>Incoming Call</td>
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Fall Prevention and Acceptance

- User-centred MMUI
  - Reachable screen
  - Touch, voice, gestures
- Pick-up, learn, bring object
  - Turntable
  - Tray to store objects
- Emergency detection
  - MMUI: Touch, button, voice, posture
- Integration on small platform
HOBBIT Summary

• Introduce robot to user by trusted person

• Mutual Care: robot and user help each other
  – Attachment theory (pets, tamagochi)

• Learn object
  – Engage user & make her feel self-confident

• Pick-up object more important than bring object
  – Emotions to express needs: asking for reward

• Detect emergency situation
  – Hand shake before alarm, Calming dialogue