Beiträge zu IKT-basierten Unterstützungssystemen für Senioren und Seniorinnen

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Content of this presentation

- **Wearable Devices**
  - SILC – An Extended Emergency Call System
  - ENABLE - Enable elderly people to live well

- **Ambient Assisted Living Technologies**
  - FRR – Intelligent Toilet System
  - Movement – Mobility Enhancement System

- **Establishing a Living Lab for Continuous User Involvement & Ethics**

**Setting the Scene**

- **Existing alarm phones for old citizens consist of**
  - a remote controlled hands free telephone
  - a button on a wrist worn transmitter device has to be pressed manually to connect to service provider
  - Some devices provide some kind of dead man function and/or combination with fall detectors

- **Problems reported by service providers:**
  - old persons are often very reluctant to press alarm button
  - Often no sufficient motivation to carry the transmitter or fall detector day and night
**Functional Ranking from User Panels**

- 106 end users (70 primary, 36 secondary = carers) in Italy, Spain, Austria and UK:
  - Health status and fall detection (automatic monitoring)
  - Check call services and periodic contacts (personal communication)
  - Reminders for medication or periodic business (automatic reminder)
  - Remote control of door lock or household appliances (remote control)

This ranking (in priority order) was then used to draw up a technical specification and develop prototypes of the required system modules.
IKT-basierte Unterstützungssysteme für Senioren

**SILC - System Structure (2001-03)**

**Main parts:**

**Wrist Unit (WU)**
(integrated sensors)

**Base Station (BS)**
linked to the Service Centre (SC)

- **Wrist Unit (WU)**
  - Internal Sensors
  - External Sensors
  - Alarm Button

- **Base Station (BS)**
  - Connected to the Service Centre (SC)
  - PSTN Modem

- **Environment**
  - (e.g. TV)
  - (e.g. pill dispenser)

- **Configuration**
  - (e.g. door lock)

- **Phone calls**
  - (wireless)
  - serial, IR

- **Voice**
  - Data

- **Service Centre**
  - (PSTN Modem)

- **Wrist Unit**
  - Alarm Button
SILC Prototype of wearable device (2003)

- Kernel software and user interface (LCD, buttons, speaker...)
- Internal sensors (IR reflection pulse sensor, temperature sensing module and a 3-axis accelerometer)
- Connection for external sensors (ECG)
- Bluetooth connection to Base Station (up to 37m)
- Additional features like environmental control, clock, calendar, reminder for medication, telephone capability shall make the device indispensable for everyday life.
- External (!) battery
Results

- Verification Tests (23 elderly users, 9 experts) in Austria and UK
- Prototype system in principle operable and tested but significant limitations (2003):
  - Sensors for pulse need improvement do reduce artefacts.
  - Power consumption needs reduction to achieve 12-24 hours operation.
  - Size and weight to be reduced
- Confirmed of value of concept of wearable alarm unit with monitoring and data and speech communication to service centre
ENABLE (FP6, 2007-2009)

- A wearable system supporting services to ENABLE elderly people to live well, independently and at ease
- The project will develop a personal, user-centred enabling system, with services, for use by elderly persons in or out of their homes:
  - to mitigate the effects of ageing and
  - to increase quality of life:
    - independence and autonomy,
    - mobility,
    - communications and social interaction,
    - care and safety.
MOVEMENT (FP6, 2004-2007)

Modular Versatile Mobility Enhancement Technology

Autonomous Platform which can dock to modules for moving people, objects and information
A User Friendly Rest Room - FRR (FP5, 2002-2005) – Role of ICT

- Supportive toilet
- Some components (examples):
  - Adjustability of Tilt and Height of toilet bowl
  - Speech Input and Output
  - Sensors for recognising falls
  - User Identification (RFID)
  - Self adapting to users needs
FRR User Tests 2002 - 2005

- Laboratory: ~200 prototype tests with users in 5 labs in Europe
- Daily Life: ~300 toilet sessions in a day care centre in Vienna
Setting up of an Living Laboratory for Assistive ICT and Older People

- Living Lab (LL) as framework for involving users (elderly and carers) from the outset
  - Co-creating and exploring ideas,
  - Commenting of prototypes,
  - Evaluation of actual benefits in real life setting

- Our Austrian AAL - LL
  - Is located in the city of Schwechat, (Vienna airport area)
  - As part of local initiative “eSchwechat” of the city administration (www.eschwechat.at)
  - First focus on sheltered housing and community care
  - Provides framework for ethical guidance and supervision of appropriate involvement of vulnerable users
Supporting carers of old people
(tele-information about present condition of family member)
eShoe - Prevention and detection of falls

FSR = force sensitive resistor, measuring distribution of pressure

Prevention and detection of falls
Thank you

www.fortec.tuwien.ac.at
www.ceit.at
IKT-basierte Unterstützungssysteme für Senioren

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CEIT - Central European Institute of Technology
RALTEC - Rehabilitation and Assisted Living Technologies

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ICT for Ageing Society – Examples

- FRR – Intelligent Toilet
  www.fortec.tuwien.ac.at/frr

- SILC – Extended Emergency Call System
  www.fortec.tuwien.ac.at/silc

- ENABLE – Wearable Device
  www.fortec.tuwien.ac.at/enable

- Movement – robotic mobility platform
  www.fortec.tuwien.ac.at/movement

- AAL – Ambient Assisted Living – Preparing an Article 169 Initiative
  www.aal169.org

- Ethics in Assistive Technology
  http://www.is.tuwien.ac.at/closetothebody/index_en.html
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