CompanionAble

Integrated Cognitive Assistive & Domotic Companion Robotic Systems

for Ability & Security

www.companionable.net

Atta Badii (UoR), Carmen Pastor (TECNALIA)

Through the graceful semantic integration of **Robotics** and **Ambient Intelligence technologies**, CompanionAble provides the AAL solution with an integrated care support architecture including remote monitoring, socialisation support and cognitive stimulation and therapy management for the care-recipient. This is mediated by a robotic companion (mobile facilitation) working collaboratively with a smart home environment (stationary facilitation).

Strategic Objective: ICT-2007.7.1 ICT and Ageing

EU Funding: € 7.800.000,00

Project Start Date: 1.1. 2008, 48 months

Partner Countries: France, Germany, Spain, Austria, Belgium, Netherlands, UK (18 partners)

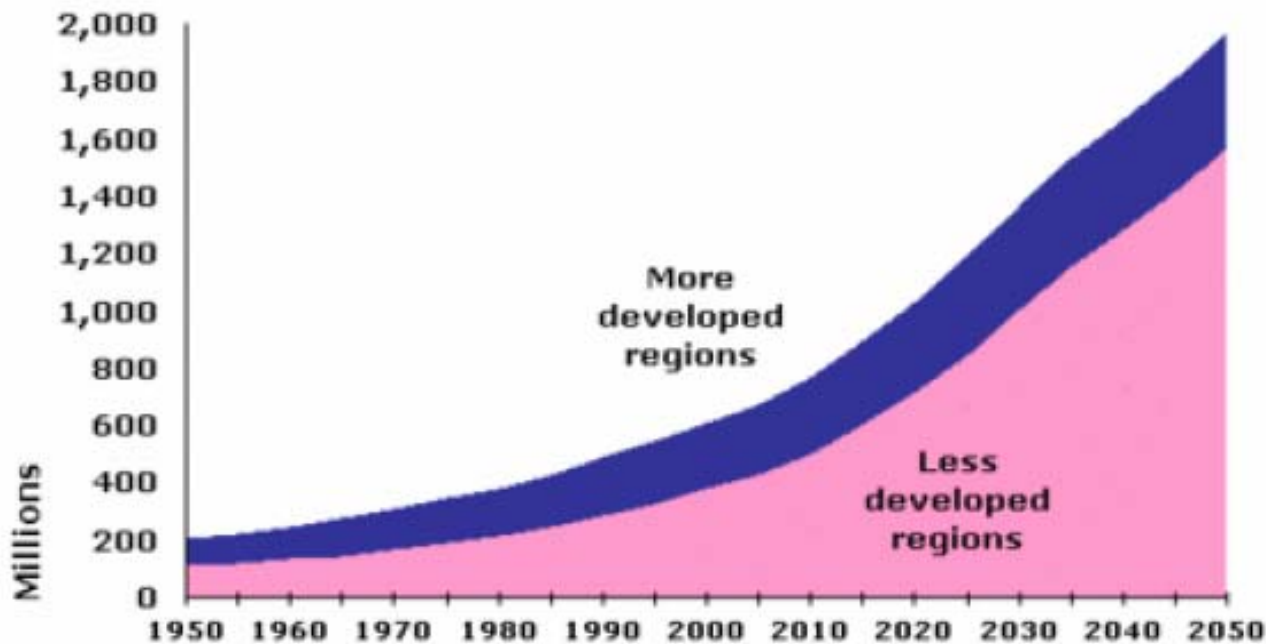Project Coordinator: Prof. Atta Badii (University of Reading, UK)

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18 Project Partners (7 countries)

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Mobile Robot Companion. Smart Home

University of Reading

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

INSTITUT TELECOM — TELECOM & Management SudParis

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY — TOMORROW TODAY

Smart Homes

METRA Metralabs mobile robots

ESIGETEL École Supérieure d'Ingénieurs

ESIEE PARIS — Chambre de commerce et d'industrie de Paris

robotiker tecnalia

ibisc

AKG

In-HAM vzw

ingema instituto gerontológico matia

UNIVERSIDADE DA CORUÑA Grupo de Investigación en Gerontología

SEVENTH FRAMEWORK PROGRAMME

VERKLIZAN BV where illusions become turnkey solutions

legrand

cure center for usability research & engineering

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- Today: 10% of people are 60+

- By 2050:   >20%

- The 60-80+ age groups are growing the fastest
- Diminishing younger population

Population over 60 by region

Source: *www.helpage.org*

SEVENTH FRAMEWORK PROGRAMME

- Toy / Pet robots: companions, learning capacities, image & speech recognition
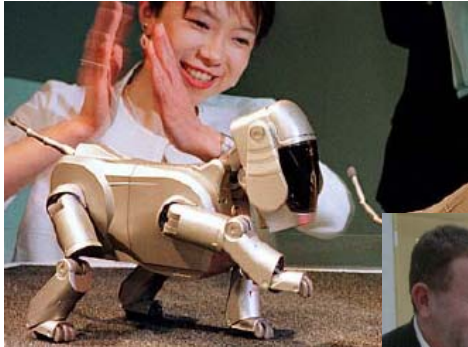
- Domotic houses
- Telecare centers

- Provide a new solution: Semantic integration of mobile robotic companion with smart home environment (*Ambient Assisted Living*)

- Integration of personal therapy management

- Homecare monitoring and care support by communication and coordination with professional helpers

- Remote Control Centre Response as required

- Improvement of quality for independent life

- Targeted Users: aged people (55+), living independently, and suffering from

  Mild Cognitive Impairment ("Cognitive impairment that is not severe enough to meet the criteria of dementia")
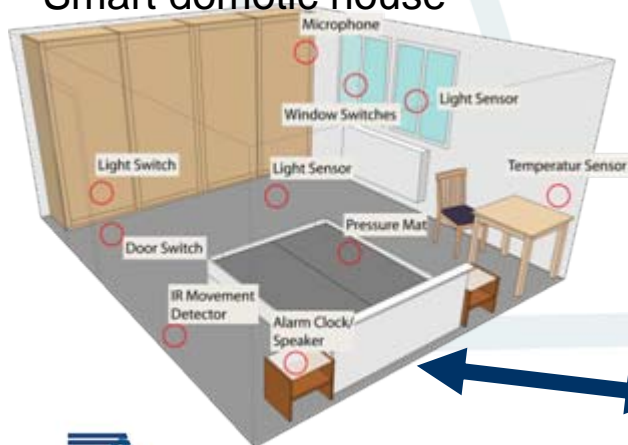
Telecare centers

Videoconference

Smart domotic house

Mobile robot companion

Interaction partner:

Anthropomorphic system

Natural interface (speech, image)

Human-like behaviour

Mobility:
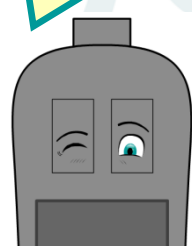
Mobile video conference

Alarm evaluation

Remote control

Cognitive Stimulation-Training, Socialisation and Care Support through:

- Integration of personal therapy management (involving home information such as the home TV screen, healthcare staff, medical professionals, gerontologists)

- Video-Conferencing, to prevent isolation and support social engagement of the care-recipient with his/her carers and the wider social setting

- Day-time activities management (diary-check, agenda setting, appointments/medication reminders as required), cognitive stimulation and training,health analysis

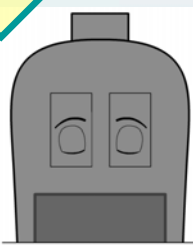- Providing social inclusion and homecare support for persons suffering from chronic cognitive disabilities.

Emotions and verbal messages

- More user-intimate as matched to user's needs, prioritised user-matched features through usability relationship based design and evaluation (UI-REF), hence higher acceptance.
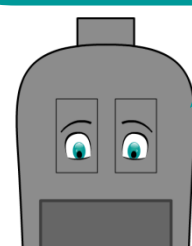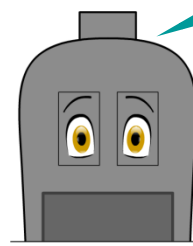
How about doing a little of cognitive training ?

You can leave your keys and glasses in my tray. I will keep it for you!

Hey! Are you thinking about something special to cook? Remember that your daughter Anna is coming to lunch tomorrow!!
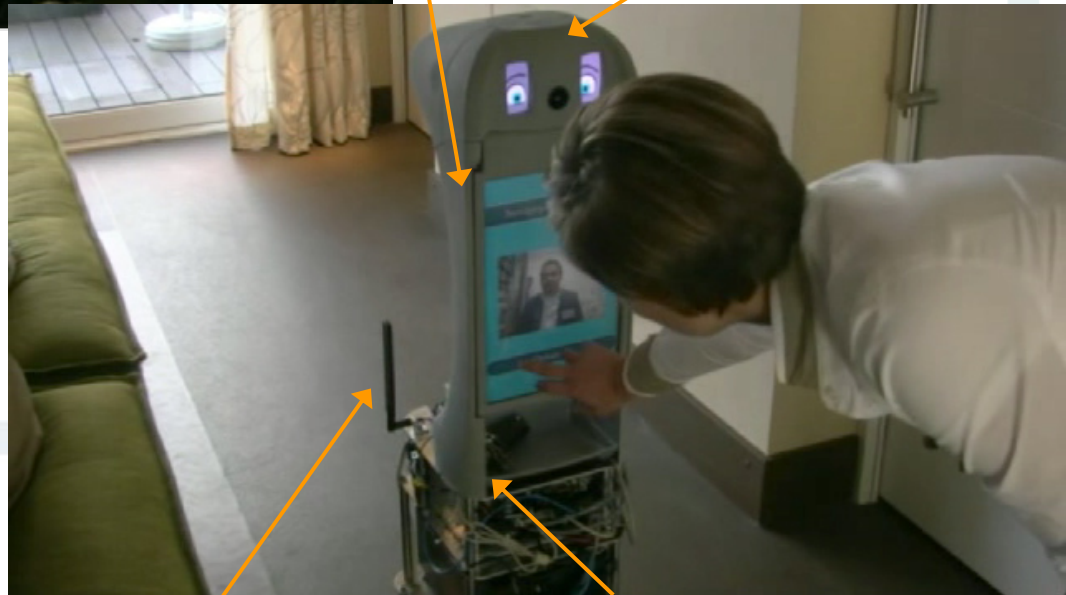
Good night! I will monitor the general state of the house and electric appliances

I am afraid you forgot to switch off the oven!

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Touchscreen with Menu options

Emotionally expressive (eyes) interface design

AGENDA

APPEL

JEUX

REPAS

HORLOGE

Tray to keep small items handy

Electronics, sensors and driving unit

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- Realisation of an intelligent day-time-management: drug intake, appointments, etc.

- Cognitive training through multiple channels (stationary and mobile).

- Videoconference between user and professionals/ relatives/ friends

- On-line recognition of distress signals/utterances/calls and sound source localisation.

- Visual detection of person's location and position, monitoring

- Basic multimodal and natural dialogue (speech input-output, touch display, gestures);

- Robot can stay at a distance (stand by), follow the user, stand close by or come closer as required by the user

  Evaluation tests in progress in Spain,

  Netherlands, France and Belgium

RCE prototype at the ALTENPFLEGE 2010

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- Realisation of test involving the smart home and the robot in:

  Spain, Belgium and Netherlands.

- Some functionalities tested already; others are waiting to be tested

- Applied methodology for prioritisation of affordances: U-REF (Badii 2006/8/9)

- Some users found to be skeptical at first but after trials expressing satisfaction

- Minor improvements are required for GUI and Cognitive Training.

- Changes will be made taking into account the results of user trials.

- Further developments in system modules and integration:
    - Pose and activity analysis
    - Clinically significant fall detection
    - More efficient dialogue management
    - Face / gesture recognition (re :user attention / frustration level)

- Further user trials are scheduled, with more functionalities working.
- Exploitation Planning in progress

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Thank you for your attention!!

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