International Workshop on

Health & Well-being

Workshop, Sophia Antipolis September 19th

Joint with **ICVS 2011**

David Daney
Personally Assisted Living

00 MOIS 2011

Welcome to

International Workshop on Health & Well-being

Organized by **the PAL Members teams**

With the support of

- **Inria** Scientific board
- **EIT ICT Labs**, Action line Health & Well-being
- **ICVS** 2011

Aims:

1. Present the activities of Pal members
2. Share scientific and technical knowledge with experts
3. Share good practices on this multi-disciplinary theme

People aged over 60

In France, 2005, 20% ; 2050, 33%
In the world, 2000, 600 millions, 2025, 1.200 Billons
Over 90% live at home (France)

Large Scale Initiative Action *Personally Assisted Living*

Research infrastructure on an important subject
works as a **Transversal team**

INRIA Strategic Plan Key Challenges

- Assistance and Service Robotics in a Human Environment
- Independence for the Elderly and Disabled

- **Financed by** Inria Scientific Board
- 2011-2014 …
- Scientific resources:
  - since 2010: 2 PhD, 2 Postdoc, 4 internship, + 2 engineer
  - Communication, visits …

LSIA Personally Assisted Living

Offer ICT **services** to improve **the autonomy and quality of life** of **frail people**

Frail people

- Elderly
- Disabled
- Family, caregivers

Environments

- Family Home
- Care, Nursing home

Properties

Offer useful and usable services

Relevance

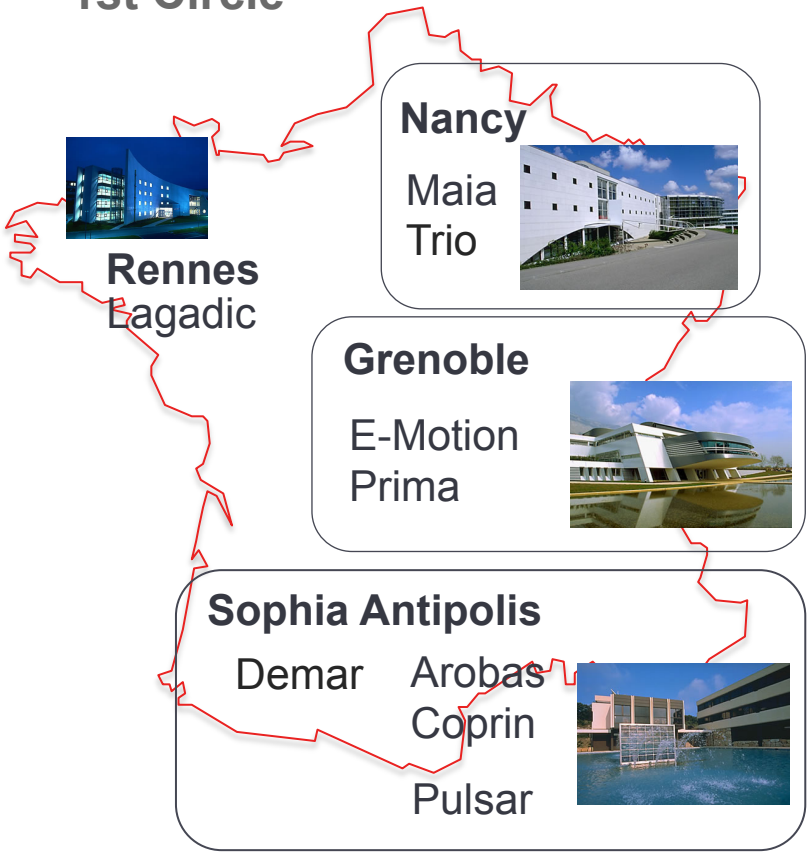
- to identify a target (expert, users,…)
- to reconcile human, tech., Med. requirements
- to ensure the validity of the proposals

- Interface :
  (level of autonomy, type of disability, cognitive skills, familiarity with technologies.)
- Interaction
  (between objects -people - social circle)
- Cost
- Security
- Dignity, Respect of the person

Co-design: individual, medical or social constraints

Scientific partners

1st Circle



Expertise

Robotics + Multi-modal perception

Mobile robot, Manipulator, Wire-driven robot, Mechanical design, Automatic control, state estimation, SLAM, distributive robotics, Motion capture, Machine learning, Plannification, Navigation, visual servoing, Multi-modal perception, Activity recognition, Smart environments ….

2nd circle

- UTT (Troyes)
- Handibio (Toulon)
- Reves (Sophia)
- Phoenix (Bordeaux)
- Flowers (Bordeaux)

Medical

- CHU Nice
- CHU Nancy
- IRR
- OHS

Coordinators/users

- CNR SDA
- CIU Santé

Industrial

- Link care service
- Medetic-Pharmagest
- …

Others partners

- CSTB
- Supelec Nancy

Opportunities EIT ICT Labs

Research themes

1. **Assessing the degree of frailty of the elderly**
   Coprin, Maia, Pulsar, Prima, Trio.

2. **Mobility of people**
   Arobas, Coprin, e-Motion, T. Fraichard

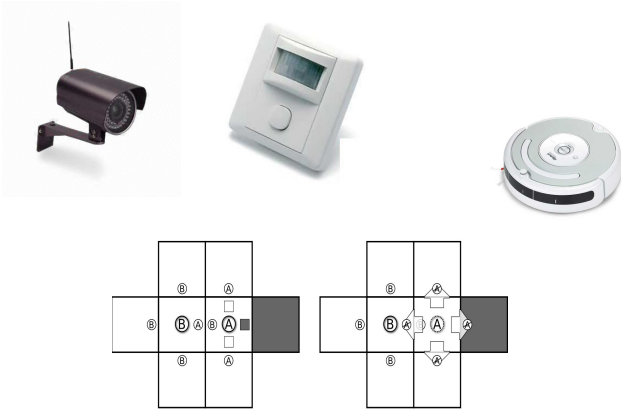
3. **Rehabilitation, transfer and assistance in walking**
   Coprin, Lagadic

4. **Social interaction**
   Prima

Researcher: **15**
PhD: **2** + 5
PostDoc: **2** + 3
Engineers: **2** + 5
Intership: **5** + 6

Assessing the degree of frailty of the elderly

- Real-time risky situation detection (falls, uneasiness, weakness, etc.)
- Automation of the Standardized Geriatric Evaluation (SGE)
- Behavioral profiling for pathological deviation detection
- Automatic analysis of behavioral disorders in patients with Alzheimer's disease



Fusion and combination of data and events observed by heterogeneous sensors (video, home automation, biomedical, accelerometer, motion sensor, etc.)

Scientific challenges :

1. **To improve the robustness of monitoring** (Automatization, Time, Environments)
2. **To recognize complex events** (posture of the person, activities)
3. **To analyse and learn** event models, scenes, and people behavioral profiles

Mobility of the person

Automated wheelchair

Walking-aid

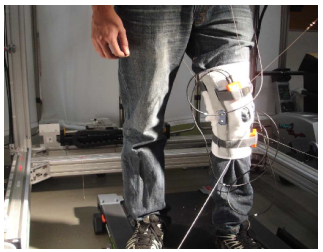
Automated shopping cart

Scientific challenges

Control : human constraints, natural interaction
Motion : safety, autonomy, Anthropomorphic

Rehabilitation, transfer and walking assistance

Transfer and walking assistance



At home rehabilitation

Services for social interaction

Create a networked family of affective devices that sense and react to the presence and monitor the activities of persons.

Ambient devices :

Sense and respond to human attention

Affective interaction (vision, touch, vibration and voice)

Challenges :

Visual observation of activity
Perception for communication and interaction
Acoustic Observation of activity
Recognizing the owner(s).
Learning to recognize attention and affect
Learning to evoke interest, pleasure and affection

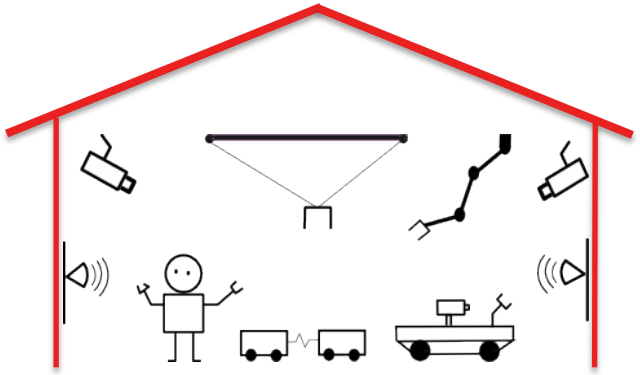
Integration, Transversal tasks




Universal service

Smart Services

Tango Samsung



Integration of services at home

Actuators and sensors networks

(QoS, Middleware…)

Experimental Platforms

Technological development actions

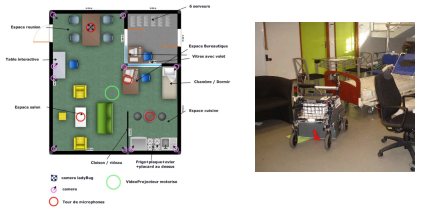
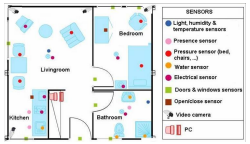
- Percee (Maia, Trio, Pal)

Distributed Perception for smart enviroment

- Infra (Prima, Pulsar, Pal) Middleware

Infrastructure for sharing perceptual components

Smart apartment
(Nancy)

Coprin Apartment
Gerhome
Domus

+ Medical rooms CHU, EPAD
+ Platform CIU

Program Sept. 19th Morning

09:30 - 10:30 Session Actimetry Chair: Jean-Pierre Merlet

- **MemoryLane - Building digital life stories for memory support**, Basel Kikhia, Luleå U of T.
- **Intelligent Tiles : Spatial Computing for Actimetry,** Olivier Simonin, Maia - Inria

10:30 – 11:00 Pause or Demo (only Group 1, 15 p.) Francois Bremond

11:00 – 12:00 Session SmartHome Chair: James Crowley

- **From Smart Houses to Smart Care:** Bessam Abdulrazak, Sherbrooke Univ.
- **Network interoperability and QoS for smart homes,** Ye Qiong Song, Trio - Inria

12:00 – 13:00 Session Demo Robotics hall

- Coprin, Inria, Jean-Pierre Merlet
- Arobas, Inria, Patrick Rives

13:00 – 14:15 (or 13:45 for Group 2) Lunch

13:45 – 14:15 Demo (only Group 2, 15 p.) Francois Bremond

Program Sept. 19th Afternoon

14:15 – 15:15 Session Context Chair: Monique Thonnat

- **The EIT ICTLabs Thematic Action Line 'Health and Wellbeing'**, Jean Gelissen
- **ICT for elderly,** Philippe Robert, Nice, Univ

15:15 – 16:15 Session Robotics for H & WB Chair: Francois Chaumette

- **DOMEO, an open robotic platform for cognitive and physical personalized homecare services,** Vincent Dupourque, Robosoft
- **Mobility assistance,** Anne Spalanzani, E-motion, Inria

16:15 – 16:45 Pause or Demo (only Group 3 15 p.) Francois Bremond

16:45 – 18:15 Session Social interaction and Robotics Chair: Francois Charpillet

- **Staying at home in old age - Contribution of new technologies and organisational concepts to maintain independence and quality of life,** Barbara Klein, Univ. of Applied Sc., Frankfurt
- **Emotions and human robot interaction,** Christophe Rousset, Robopec
- **Perception for social interaction,** James Crowley, Prima, Inria