



Home as an A**C**tive Environment (H-ACE)

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Fernando Ferri received the degrees in Electronic Engineering and the PhD in Medical Informatics at the University of Rome "La Sapienza".

He is Researcher of the National Research Council of Italy. He was contract professor from 1993 to 2000 of "Sistemi di Elaborazione" at the University of Macerata.

He is the author of more than 90 papers on international journal, books and conferences. The main methodological areas of interest are: Data and Knowledge Bases, Geographic Information Systems, Human-Computer Interaction, Visual Interfaces, Sketch based interfaces.

IRPPS -- CNR

The Irpps is an Institute of the National Research Council.

The Institute identifies and studies the lines of development and transformation of population and contemporary society. Through its activities the Institute tries to satisfy requests by the scientific community, the political actors, the public administration and the civil society.

The research activities of the Institute follow the lines laid out in its founding act:

1. Study of the relationship between population trends and social and economic development.
 2. Study of social dynamics and policies regarding the welfare systems.
 3. Study of the societal change, the diffusion of knowledge and the information technology.
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Motivation

“...the public health problem of **dementia** has reached **epidemic proportions**. It affects about 6% of individuals over 65 years of age...” van der Flier W.M. and Scheltens P. (2006)

“The prevalence of dementia was 54 per 100 000 people aged 30-64 in UK. For those aged 45-64, the prevalence was 98 per 100 000.” Harvey RJ et al. (2006)
Reasons to admit to supervised care
elderly or cognitive impaired people

Cognitive Impairment

One of the first symptoms of dementia **Memory Loss**

Memory loss consequences

To forget appointments
To lose one's way
To forget consumption of medicines

Solutions

Interactive notebook
Movements and activities monitoring device
.....

Environmental hazards

in the home environments cause falls in 95% of patients' own homes (Lower K. et al, 2000)

Falls consequences

Fractures with permanent outcomes and motor autonomy loss

Solutions

Movements sensitive light device
Automatic adjustable chairs
.....

The Main Goals of the Proposal

■ **Location Monitor**

The integration of a variety of technologies throughout the home space, which range from relatively simple and robust sensors, to more sophisticated and higher resolution, state-of-the-art computer vision solutions allows to know where the people are located.

■ **Activity Recognition**

The development of recognition methods to monitor the general activities of the occupants using information obtained by sensors. This awareness includes low-level tasks such as watching TV, and higher-level tasks such as preparing a meal, or taking a medicine.

■ **Hazard Prevention**

The development of recognition methods to detect and prevent risks. In the prevention of risks can participate both people in and out of the domestic environment

■ **Alarm Management**

The development of methods to manage alarms (for example a fall).

Main Challenges

■ Vision and scene recognition

- Capturing and understanding information
 - gestures,
 - facial expressions,
 - behaviour,
 - emotions.

■ Sensors/actuators

- Wearable sensors
- Sensors for detecting actions (touch, noise, speech,...)
- Sensors for detecting states (temperature, ...)

■ Context- and self-awareness

- user modeling: persons (the patient, its family and other actors involved in the care process) with which the system interact

The Proponents

- Istituto di Ricerche sulla Popolazione e le Politiche Sociali – CNR
- Università di Roma “La Sapienza” – Dipartimento di Psicologia
- AtosOrigin
- Iriscom
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