



Engineering & Research on  
Computational Intelligence



TECHNICAL UNIVERSITY  
OF CATALONIA

**Dr Andreu Català**

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Centre for the Dependency Care**

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### Expertise:

Adaptive and intelligent sensors, soft-computing techniques, IC's design, intelligent monitoring and prevention, knowledge integration, electronic tissue, dynamically configurable electronics, classification systems, ...

### Special interests:

Fall detection and prevention, medicines monitoring, gait and activity monitoring, assisted care of chronic diseases, technological autonomous rehabilitation, preventive remote assistance, supervision of medical protocols, ...

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<http://petrus.upc.es/~microele/neuronal/>

### Infrastructure and Facilities:

- **Technical Research Centre for the Dependency Care:** its aims are to improve the quality of life of dependent people, to increase their autonomy and to enhance the help to their social and family environment, by means of the study and application of electronic and communication technologies
- **Accessibility Centre:** architecture, design and technology for all
- **Ubiquitous Computing Lab:** development and implementation of smart cooperative systems
- **Usability Lab:** user experience assessment of assistive and adapted technologies



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### Related projects:

- **SAPIENS – Embedded Portable Agents System for Safe Natural Environments:** the aim of SAPIENS is to develop an intelligent labeling system of autonomous and portable devices for blind people, in order to configure, identify, localize and interact any kind of daily life elements (i.e. clothes, medicines, ...) in a wireless and user-friendly way.
- **ACCUA – Ubiquitous Computing Cooperative Architecture for the Assisted Living (MCYT TIC2003-09179-CO2-01):** the aim of ACCUA was to develop intelligent hardware devices which were able to make tasks following a cooperative control scheme and to implement user-friendly and non-invasive interfaces for the control, monitoring and supervision through internet.
- **POETIC – Reconfigurable POETIC Tissue (IST-2000-28027):** the aim of POETIC was to schedule, develop and implement an electronic tissue (based on a specific FPGA) which will be used as the physic substrate for the construction of artefacts based on model POE and with capacity to evolve, grow, reappear and replicate itself and to learn.
- **RECONF – Design methodology and environment for dynamic reconfigurable FPGA (IST-2001-34016):** the aim of RECONF was to define, specify and implement efficient tools for the user to make designs over dynamically reconfigurable devices (D\_FPGAs), in a simple and effective way.

**Suggestions for proposals:**

- Adaptive smart assistive systems for dependent people in autonomous movement:** the proposal will be focused on the development of novel control structures to be used in body sensor networks for gait and posture monitoring (wearable physical elements); on the evaluation of techniques for the autonomous movement of robotic vehicles for mobility aid; and on the design of evaluation metrics for any mobility system from the biomedical point of view: physical, measuring and analyzing corporal parameters of the individuals like cerebral, cardiac and respiratory activities, and psychological, evaluating and analyzing emotions, feelings and the user experience
- Intelligent labeling system in an ambient assisted living for dependent people:** the proposal will be focused on the development of embedded sensor labels to configure, identify, localize and interact any kind of daily life objects in a wireless and user-friendly way; system will interface with the user through a portable voice synthesizer; system will be specially oriented to blind people and people with memory losses.

**Adaptive smart assistive systems for dependent people in autonomous movement**

Body Sensor Networks  
 Technical University of Catalonia



Robotic Wheelchair  
 University of Zaragoza



Guido Haptica  
 Trinity College



Balance Master  
 Technical University of Catalonia  
 CHC



### Intelligent labeling system in an ambient assisted living for dependent people

