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Ambient Assisted Living: Home Care

J.UCS Special Issue

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Ambient Assisted Living (AAL) proposes solutions based on Information and Communication Technologies (ITC) to enhance the quality of life of older people. AAL promotes the provision of infrastructures and services for the independent or more autonomous living, via the seamless integration of info-communication technologies within homes and residences, thus increasing their quality of life and autonomy and reducing the need for being institutionalized or aiding it when it happens (See: http://www.aal-europe.eu/)

According to the European Union, up to 19 Million persons give primary assistance with daily activities to their elderly or dependent relatives. Moreover, most people prefer to live independently in their own homes. However, formal care services are in many cases indispensable and, in this way, ICT-based solutions can enable and sustain older adults to continue managing their daily activities in their homes. Thus, this edition focuses on "Home Care" solutions for elderly according with the 5th call of AAL Joint Programme.

This manuscript is the preface for the special issue entitled "Ambient Assisted Living: Home Care" which gathers the selected papers from the public call for papers opened during Autumn 2012 and from a selection of papers of the 4th International Work-conference on Ambient Assisted Living (IWAAL 2012), held in Vitoria-Gasteiz, December 3-5, 2012.

The scientific committee of the conference selected the best papers addressing Home Care on Ambient Assisted Living after the conference based on marks scored by chairmen and referees. The extended versions of these papers and the papers received from the open call were collected to additional rounds of peer reviews. The most scored papers have been included in this special issue, covering topics such as novel systems and processes to treat diseases (e.g. obesity), tele-mobile-monitoring, rapid development of tele-medical solutions, multi-agent solutions for people monitoring, mobile-based activity recognition, virtual and augmented reality solutions.

More specifically, Jaime Guixeres, et. al., in the manuscript entitled "*Effects of Virtual Reality during Exercise in Children*" have analyzed how virtual reality may

serve to enhance the psychological benefits of exercise as a kind of home-care. They conducted two studies measuring more than 200 children and the studying benefits of virtual reality as a support for aerobic exercise.

In the manuscript "*Evaluation of Bluetooth Low Energy Capabilities for Tele-mobile Monitoring in Home-Care*", Antonio J. Jara, et.al., have compared Bluetooth Low Energy with other alternatives in a general perspective and focusing on health tele-monitoring in Ambient Assisted Living scenarios.

Jan Havlik et. al., discussed about remote patient monitoring in the paper "*A Modular System for Rapid Development of Telemedical Devices*". This manuscript describes the hardware solution of a modular system focused on the rapid development of tele-medical devices. For practical use, the proposed system tries to satisfy additional requirements, namely low power consumption, small size, lightweight, and long battery life.

Also, regarding to patient monitoring, the paper entitle "*An Alert System for People Monitoring Based on Multi-Agents using Maps*" (Pilar Castro, et. al.) shows a novel system to monitor the activities of users collecting data from mobile device sensors via agents. In particular, this system allows defining new alarms, agents and functionalities in an easy way, allowing the scalability of the system.

Tele-diagnosis is also an important topic related to home care. In these terms, Maria-Aydee Sanchez-Santana proposed a system to semi-automatically identify and quantify potential health complications in the paper "*A Tool for Telediagnosis of Cardiovascular Diseases in a Collaborative and Adaptive Approach*". This system provides remote collaborative sharing of this information among different actors in the field of medicine (nurses, practitioners, etc.).

The paper "*Energy Efficient Smartphone-Based Activity Recognition using Fixed-Point Arithmetic*" (Davide Anguita et. al.) presents a novel approach for the classification of Activities of Daily Living using smartphones and based on a modified Support Vector Machine model that works with fixed-point arithmetic. This work can be applied to AAL applications such as remote patient monitoring.

Maria Lourdes Martínez-Villaseñor and Miguel González-Mendoza have proposed a process that considers internal structure of source data for the schema integration with a ubiquitous user model. As the paper "*An Enhanced Process of Concept Alignment for Dealing with Overweight and Obesity*" shows, that process examines data exacted from different applications and devices to deal with diseases.

Finally, the paper entitle "*Achieving Adaptive Augmented Reality through Ontological Context-Awareness applied to AAL Scenarios*" analyzes how ontological knowledge representation and management can personalize augmented-reality-based applications for home-care.

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Guest editors