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Preface

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This issue of JAISE is a regular issue consisting of seven articles. Review of these articles were supervised by our associate editors David Keyson, Ben Kröse, Matjaz Gams, Jie Yang, Davy Preuveneers, Jesus Favela, James Dooley, Hans Guesgen, and Victor Zamudio, whom we thank for their work.

1. This issue

In an Ambient Intelligence system, interactions between the system and the human users can in principle benefit from the same attributes that social interactions between humans possess. For example, a system may show empathy to the user by understanding the user's emotions. With this level of intelligence embedded in the structure of the system, it will be possible to develop rich, human-like interactions in a smart environment. To enable ambient social interactions, AmI systems need to aggregate information from a set of sources such as the social information of users, available services, the physical environment, and a number of other sources of heterogeneous data. This aggregation poses a challenge for the AmI system as these sources are often highly dynamic and diverse. The paper **"Building Knowledge-based Systems to Enable Ambient Social Interactions"** by Su et al. describes how to systematically aggregate heterogeneous information sources to enable ambient social intelligence, both for individual users and for user groups. The paper proposes a general framework for aggregating information from different sources and presents a new data representation model, named Entity Notation, as a starting point for the purpose of connecting all information to a knowledge-based system. The paper also discusses opportunities to support Semantic Web technologies for developing smart functions for ambient social interactions.

Emergency situations involving elderly persons living alone vary widely in their cause and form, but in many instances the speed of the emergency response can have a significant impact on the outcome. A long delay in the arrival of help can cause deterioration of an elderly person's health status, and as a result the affected person may no longer be able to pursue daily life in a normal way. With the growing elderly population, the total number of situations of physical helplessness and the cost of the associated treatment are expected to increase as well. The paper **"Detection of Physical Helplessness at Home Using Ambient Sensor Information"** by Storf et al. presents a new approach to modeling an individual's normal behavior automatically and continuously. Based on the derived models, the approach identifies inactivity in order to allow the provision of assistance when necessary.

Another area of active research and development for serving the elderly population is the design of cost-effective solutions which can improve the quality of life of patients with a chronic illness by reducing the frequency of clinical visits. A research field under study in this area is the unobtrusive monitoring of implanted wireless medical sensors. The upcoming development of the Internet of Things (IoT) envisions IP-enabled devices such as pacemakers and Implantable Cardioverters Defibrillators (ICDs), offering an opportunity to introduce a completely new scenario in the field of remote monitoring of patients with these implanted devices. With the latest advances in microelectronics and communication technologies leading to the commercial availability of IPv6-enabled sensors, it is easy to envision a future with health monitoring sensors connected to the IP world. A key factor to the success of these systems will be the security of the collected data and the protection of the privacy of the user. In the paper **"Securing access to next generation IP-enabled pacemakers and ICDs using Ladon"** by Astorga et al. a new authentication and authorization protocol called Ladon is presented as an efficient way to protect the privacy of the information

collected by health-sensing resource-deprived devices such as pacemakers and ICDs. The paper also presents a prototype implementation based on general-purpose sensors to demonstrate the feasibility of using the proposed protocol in a real-world deployment.

As advances in the technology offer practical premises for realizing Ambient Intelligence in everyday life applications, systems that observe the conditions in the real world are tasked by deriving plans to act best in response to the observed event and learn to serve the needs of their users in a proactive fashion. Organic Computing is a recently introduced research area which focuses on building self-organized systems to solve complex problems. Autonomous entities in this premise are supposed to act without strict central control and achieve global goals although their decisions are based on local knowledge. In practical situations, not all possibly occurring situations can be foreseen during the development process of the system. Hence, the system must be adaptive and equipped with learning capabilities such as the ability to learn new strategies for previously unknown situations. The paper **"Incremental Design of Adaptive Systems"** by Tomforde and Müller-Schloer builds upon the notion of Organic Computing and presents a parameterization step for the online adaptation mechanism to move design time decisions that are typically taken by engineers to runtime.

Intelligent campus environments form a class of scenarios in which a network of data collection and decision making systems provides efficient access to services such as learning, management, governance, health, social events, and green practices. Many activities in intelligent campus environments need to be adapted to user's needs. Examples include room assignment for classes and meetings according to the devices and recording options to be used in such meetings, and recommendations of virtual machine configurations available in the labs according to the activity to be performed there. With The expansion and evolution of smart devices such as smartphones and tablets, it is now possible to provide access to these applications for different users based on their status and needs. The paper **"Resource assignment in intelligent environments based on similarity, trust and reputation"** by Caballero et al. considers a multiagent system approach to developing such ubiquitous systems to cope with the distributed nature of data collection and decision making processes. The paper offers an alternative for user profiling in intelligent campus focused on a semantic description of users' requirements on the resources or services they need. The proposed mechanism is based on similarity among profiles as well as trust and reputation among agents.

The dynamic, adaptive, and autonomous nature of intelligent environments makes them ideal for supporting people's health and well-being. Managing a health condition usually requires the patient or their caregiver to intensively monitor related physiological indicators. The characteristics of intelligent environments such as continuous monitoring and long-term data collection make them suited for enhancing the well-being of their occupants. Such data records can be used to identify critical health trends and track them with greater accuracy. Unobtrusive sensors can reduce stigmas and enable occupants to live their lives more naturally. The paper **"Themes identified and lessons learned through the development of intelligent environments that support healthy well-being"** by Boger et al. reports on the experiences of a collaborating network of scientists, engineers, and rehabilitation specialists across several institutions who have been working with end-users to develop devices and systems for supporting people in home and institutional environments. The paper presents key themes for supporting the development of health-centric intelligent environments and systems. Examples of such themes are illustrated through several case studies of real-world applications. The paper concludes by highlighting some areas that need to be considered by the field as intelligent environments move out of the research lab and into people's homes.

Merging immersive virtual environments, natural language processing and artificial intelligence techniques offers many opportunities for developing novel intelligent environments applications. Education is one of the most interesting applications of immersive virtual environments, as heterogeneous groups distributed across the world can be supported by means of existing communication infrastructure. Users in different locations can interact and collaborate in virtual spaces which support adaptive and selective methods of interaction and experience sharing. With the growing maturity of conversational technologies, the possibilities for integrating conversation and discourse in intelligent learning environments are receiving greater attention as these techniques can offer a more pleasant experience than the existing text-based interactions. The paper **"An Approach to Develop Intelligent Learning Environments by means of Immersive Virtual Worlds"** by Griol et al. demonstrates the possibility of integrating speech technologies and

natural language processing in virtual worlds, and presents a practical application of the integration and evaluation of these functionalities to create an education environment. The paper discusses the results of deploying the proposed technology in several university classes and offers guidelines for future extensions.

2. Upcoming issues

The following is the list of upcoming issues of JAISE:

- May 2014: Thematic Issue on *Playful Interactions and Serious Games*
- July 2014: Regular Issue
- September 2014: Thematic Issue on *Challenges of Engineering Intelligent Environments*
- November 2014: Regular Issue
- January 2015: Thematic Issue on *Affect Aware Ubiquitous Computing*

More information on the call for papers to the future thematic issues is available on the webpage of JAISE at: http://jaise-journal.org/.