Preface

Hamid Aghajan [a] and Juan Carlos Augusto [b]

[a] *Ambient Intelligence Research (AIR) Lab, Department of Electrical Engineering, Stanford University, USA*
[b] *School of Computing and Mathematics and Computer Science Research Institute, University of Ulster, UK*

This issue of JAISE is a regular issue consisting of six articles. Review of these articles were supervised by our associate editors Gilles Privat, Andrea Prati, David Keyson, WenZhan Song, and our guest editors Hedda Schmidtke, Juan Botia, and Simon Egerton, whom we thank for their work.

1. This issue

Monitoring the behaviour of visitors to a museum has been used as an interesting case study in public space behaviour analysis. For instance, knowing the typical path taken by visitors throughout the museum can provide the museum designers with important feedback about the exhibited content. Another topic of interest is to study the change in the emotion of visitors as they visit different exhibits. Such a study can become particularly interesting when the museum offers opportunities of interacting with the exhibit to the visitors. The paper **"Design of Museum Exhibits and Analysis of Visitor-Exhibit Interactions"** by Kiriyama and Sato discusses the design of three museum exhibits. Arithmetik Garden is an exhibit for experiencing mathematical equations to reach a set goal. Pool of Fingerprints presents a new way of looking at fingerprints by using fingerprint-matching technology. In this exhibit, visitors feel an emotional attachment to their fingerprints. Nominal Divide allows visitors to experience how they are seen through computer vision. The paper discusses the design of these three exhibits and offers results of monitoring visitor experiences.

The Internet of Things is becoming feasible as progress is constantly made to make everyday objects uniquely addressable and interconnected. Building upon the notion of the Internet of Things, the Web of Things attempts to expand the ecosystem of Internet-enabled embedded devices while reusing well-accepted and understood Web principles. While the Internet of Things focuses on interconnecting heterogeneous devices at the network layer, the Web of Things can be seen as a promising practice to achieve interoperability at the application layer. It is about taking the Web as we know it and extending it so that anyone can plug devices into it. Home appliances equipped with microcontrollers and wireless modules can be interconnected to form networks, extending residences into smart home environments. The paper **"Building Energy-aware Smart Homes using Web Technologies"** by Kamilaris et al. presents a proof-of-concept system for home automation, built using Web technologies, and examines its performance in a real setting. The paper proposes an application framework for smart homes in which practical issues such as transmission failures, concurrent user presence and priority handling can be studied.

Designing gesture-based control systems for home entertainment has traditionally followed the level of computations available to interpret gestures. As such, complex gestures have sometimes been preferred by designers over simpler ones because of their relative advantage in computational feasibility. Hence, many proposed gestural command systems may not reflect user's natural gestures. The paper **"A Comparative Study of User-Defined Handheld vs. Freehand Gestures for Home Entertainment Environments"** by Vatavu presents the results of a participatory study in which users were involved in the design and evaluation of gesture commands for typical home entertainment tasks. The user study reported in this paper offers a comparison between user-defined gestures for two different capture technologies: using handheld devices to sense motion, and employing freehand gestures and postures. Based on the results, the paper proposes gesture sets for the handheld and freehand gesture scenarios for being considered by designers of gestural interfaces for smart home environments.

With the prevalence of easily downloadable applications, many mobile users find their smartphone or

tablet computer interfaces crowded with an increasing number of application icons. Many of such applications are accessed by the user in specific contexts such as when the user is in a specific geological location such as home or office or is commuting on a train. The paper **"Mobile Application Usage Prediction through Context-based Learning"** by Leroux et al. presents a framework for modeling and prediction of a user's mobile application usage behavior. On the mobile device, the proposed framework continuously monitors the user's previous use of applications together with several context parameters such as location and speed. Based on the retrieved information, the framework deduces application usage patterns, which define a correlation between a used application and the monitored context information or between different applications. Context profiles generated this way allow for predicting user's interest in specific applications given the detected context of the situation.

Next generation of the information and communication technologies (ICT) is expected to provide means for facilitating social and healthcare assistance services to support the progressive aging in the elderly population. In order to achieve this objective, the Ambient Assisted Living (AAL) initiative proposes ICT systems and services to promote autonomy and an independent life among the elderly. The paper **"How network operators can enhance Ambient Assisted Living applications through Next Generation Networks"** by Moreno et al. describes the design and implementation of a group of services, called service enablers, which helps AAL applications to be supported in next generation networks. The presented enablers are designed to support the teleconsulting application requirements of future networks, involving the implementation of a virtual waiting room, a virtual whiteboard, a multimedia multi-conference and a vital signs monitoring application. A use case is defined and implemented to evaluate the performance of the developed enablers.

Localization of people and objects finds many interesting applications in smart environments. While various technologies such as vision and WiFi-based triangulation have been examined for determining the location of users in a place, finding the position of passive objects remains a challenge for these technologies given the complexities of the deployment or the necessary algorithms. RFID tagging of objects provides an alternative solution which is easier to deploy and relatively more scalable than other methods. The paper **"R-LABS: An RFID-Based Indoor Localisation System Using Antenna Beam Scanning"** by Vongkulbhisal and Zhao proposes a new RFID-based object localization technique based on triangulation of the antenna beam patterns from a multiple-antenna system.

2. Upcoming issues

The next issue of JAISE will be a Thematic Issues on *Agents* to be published in May 2013, followed by a regular issue in July, and a Thematic Issue in September on *Design*.

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