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Preface

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This is the 6th and final issue of JAISE in 2015. With this issue, JAISE completes its 7th year of publishing the latest research results in AmI and SmE. We thank our advisory and editorial board members as well as the reviewers and all authors for their valuable contributions to this volume of JAISE. The list of reviewers who have contributed to JAISE in the past year is included in this issue.

This issue of JAISE is a regular issue consisting of 10 articles. Review of these articles were supervised by our associate editors David Keyson, Juan A. Botia, Shin'ichi Konomi, Björn Gottfried, Stefano Chessa, Vincent Tam, and Caifeng Shan, whom we thank for their work. The back pages of this issue contain information about upcoming events and other related material, including PhD thesis reports. The list of issues for the coming months is included at the end of this preface.

1. This issue

Work environments are continuously becoming richer in sensors, objects and devices. Improving the efficiency and performance of the users working under various contextual states in these environments is the target of many of these technology-based systems. However, with new technology comes the additional task of learning how to use it without having the users spend significant time to understand how to accomplish their tasks. Multimodal adaptive interfaces can offer options to the users as they can provide the required information in the most suitable modalities by taking into account the current context of use. The paper **"Adaptive Multimodal Web User Interfaces for Smart Work Environments"** by Ghiani et al. proposes an approach consisting of an adaptive, context-sensitive UI based on an architecture for context-sensitive service front-ends. The paper enumerates various contextual aspects, including user-related ones such as tasks and preferences, technological parameters such as available interaction resources, as well as the environmental context. The proposed solution is based on the use of model-based languages for interactive application descriptions in order to facilitate the possibility of deriving multimodal versions adapted to various contexts of use.

Interfaces in ambient intelligent environments have to be designed according to the needs and behavior of people in very specific situations. This requires an indepth understanding of the particular context and its influencing components. Exploring user interaction in specific contexts is often based on simulated environments and semi-functional prototypes of interactive systems. A common way is to use different types of sensors to identify contextual settings in real-time. Contextual situations have multiple aspects and change rapidly. In consequence, it is highly challenging and time consuming to consider all possible situations and corresponding reactions and to evaluate them in real time. The paper **"ConWIZ: The Contextual Wizard of Oz"** by Grill et al. proposes a combination of context simulation with the Wizard of Oz method, where a human "wizard" simulates missing functionalities or system intelligence. This allows for rapid prototyping of the interactive part of the system while the system's intelligence is simulated by a human.

Most Ambient Assisted Living (AAL) systems need some method of locating the user. Indoor localization is an open research area which has produced much literature. Generally speaking, an indoor localization system requires devices scattered through the environment for sensing the presence of people. The paper **"CEO: a Context Event Only indoor localization technique for AAL"** by Potorti and Palumbo argues that many AAL applications generally have low accu-

racy requirements for indoor localization; hence, this task may be accomplished by using an existing smart environment infrastructure without adding dedicated positioning sensors. The paper examines the possibility of exploiting only the information provided by a basic domotic environment consisting of light switches, anti intrusion systems and home appliances, which communicate their activation over a home network, in order to obtain an estimate of the position of a single inhabitant.

Most current mobile devices are equipped with a variety of sensors, offering numerous input channels for expressive interaction. For instance, many smart phones have multiple types of sensors (e.g., touch, light, proximity, acceleration, direction, air pressure, and spatial orientation) providing users with richer interactions. In this context, researchers have leveraged these capabilities to create new input techniques by repurposing a sensing modality to emulate a different sensing function. The paper **"PseudoSensor: Emulation of Input Modality by Repurposing Sensors on Mobile Devices"** by Hwang and Wohn proposes the concept of PseudoSensor, which emulates unavailable input modality by repurposing available sensors on mobile devices. The paper presents a set of applications based on emulating pressure sensing through different existing sensors of a smart phone.

Smartphones have a great potential as tools to adapt daily living spaces to the specific needs of its inhabitants. These devices usually host selected content, personal information and useful applications for their users, apart from continuously gathering their context data and preferences. Taking this fact as starting point, The paper **"PERSEO: A system to Personalize smart Environments through Smartphones, sEnsors and media Objects"** by Bergesio et al. describes a system that implements a mobile-instrumented interaction concept to personalize a smart space by using a network of presence sensors and media objects. When the smartphone comes to the proximity of any of the trigger objects in the environment (e.g. NFC or Bluetooth enabled devices), it can seamlessly transfer contents or application control to an available media object in the environment, in order to improve the user experience. The paper explains the interaction flows and details the architecture components through an Android-based mobile prototype working in a smart living room.

Context prediction plays a vital role in an assistive ubiquitous environment. Current state of the art approaches utilize the user's history information for predicting the context of the events. When the user's history does not provide adequate contextual information for the observed event at a time, history-based context prediction techniques fail to predict the appropriate future context. The paper **"A Collaboration based Context Prediction in Smart Office"** by Ahmad and Do-Hyeun proposes a profile-based collaborative context prediction approach based on utilizing the history of similar users of the ubiquitous environment.

The recognition of activities of daily living (ADLs) refers to the classification of activities commonly carried out in daily life, which are of particular interest in applications such as health monitoring, smart home control, and elderly care. Monitoring of daily life can take place with numerous sensors, both ambient and wearable, ranging from ambient video cameras to wearable accelerometers, environmental, physiological, and audio sensors. The paper **"Activities of Daily Living recognition using optimal trajectories from motion boundaries"** by Avgerinakis et al. proposes an approach for activity recognition based on motion and appearance features extracted from video cameras. The paper aims to reduce the computational cost of feature-based methods by only considering the parts of the image with large motion vectors.

Different single and multi-robot solutions can be considered as mediators for intelligent environments. A network of intelligent autonomous service robots is able to live in our homes and perform physical tasks to help us in our everyday life. Such a network can provide us with information, communication, and entertainment. However, the efficiency of such a network depends critically on the quality of solving a number of difficult problems of robotics. An example is the multi-robot coverage that is currently one of the most explored research areas in robotics. The paper **"The multi-robot forest coverage for weighted terrain"** by Gorbenko and Popov considers efficient algorithms for the problem of the multi-robot forest coverage for weighted terrain, and proposes a genetic algorithm for the direction solution to the problem.

Many interesting educational interactions occur among groups of ordinary (amateur) people in ad-hoc online communities that are drawn together by shared interests. The common determinator is that, within the ecologies of a particular community, people create and share their work without gatekeepers or geographic restrictions. More recently, the integration of social computing, online sharing tools, and other HCI collaboration technologies has made it possible that do-it-yourself cultures and practices be adopted more

widely. Thousands of such communities share or create their projects with technical and networked means; communities that focus on handicraft, everyday home improvement, gardening, experimental music, citizen journalism, solving of social problems and amateur astronomy, are among the myriad communities with millions of online followers. The paper **"The design methodology for studying smart but complex do-it-yourself experiences"** by Kymäläinen offers examples of design-oriented human computer interaction (HCI) research for creating do-it-yourself experiences for emerging technologies, and examines the design objectives through three case studies. The first case study introduces the design of a home control system for the elderly. The second case study presents a music creation tool research effort in music therapy for those with disabilities, and the third study, named life story creation, presents a memory-sharing application for elderly amateur writers.

Accidental falls are a great risk for seniors living alone. Various sensing and reasoning techniques, such as those based on the use of cameras or accelerometers have been examined in the literature. Kinect sensors have been used recently to address different pose recognition applications. The paper **"FADES: Behavioral Detection of Falls Using Body Shapes from 3D Joint Data"** by Yoon et al. proposes a solution for detecting different types of falls in a home environment using 3D joint data from Kinect. The proposed method is based on a machine learning-based approach which accepts raw skeletal joint data from Kinect as an input and performs training in two separate phases: one for body shape detection and the other for behavior sequence detection.

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