

# Preface

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This is the 6th and final issue of JAISE in 2013. With this issue, JAISE completes its fifth year of publication, marking another productive year in the dissemination of research 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. Moving forward to 2014, JAISE will keep the tradition of alternating Thematic Issues with Regular Issues.

This issue of JAISE is a regular issue consisting of six articles. Review of these articles were supervised by our associate editors Matjaz Gams, Davy Preuveneers, Michael Beigl, and Hans Guesgen, whom we thank for their work. The back pages of this issue contain information about upcoming events and other related material, including a PhD thesis report. The list of reviewers who have contributed to JAISE in the past year is also included in this issue.

## 1. This issue

Regular physical activity practice provides many physiological benefits such as reducing the risk of heart disease and offering important psychological gains. Particularly for the elderly population, promotion of the practice of physical activity, especially at home, is an essential component of a wellness plan. It has been proven that for the elderly population adherence to exercise is greater when performed at home than when performed in centers. However, the physical activity needs to be supervised in order to improve physical fitness while minimizing the risk of injuries due to overuse. The paper **“A personalized exercise trainer for the elderly”** by Bleser et al. introduces a platform to supervise, motivate and help the practice of physical activity at home. The system has been developed within a European Ambient Assisted Living

project, and the article elaborates on the requirements of exercise planning from the point of view of health care professionals. The design of the user interface to suit the mental and physical fitness of the elderly population is discussed and the article describes the sensor setup used for measuring the body movements of the user during an exercise session.

One of the goals in Ambient Intelligence is to enable Intelligent Environments to make decisions based on the preferences of the users. In an explicit query method, users can communicate their own preferences with the environment using Event-Condition-Action (ECA) rules. However, defining every preference, and maintaining them up-to-date can be cumbersome for users. Therefore, an alternative mechanism to learn from user behavior and adapt to small changes without explicitly asking the user will be beneficial. Inferring behaviors effectively from data collected from primitive sensors in an Intelligent Environment can be a challenging problem. The paper **“Inferring ECA-based Rules for Ambient Intelligence using Evolutionary Feature Extraction”** by Shafti et al. proposes an evolutionary constructive induction method to facilitate the inference of user preferences from data collected from simple sensors. Instead of the typical behavior modeling approaches aimed at summarizing or predicting user’s activities, the approach developed in the article learns the user’s preferences regarding the current situation and the state of the environment.

Software agents running on mobile devices can negotiate on behalf of the user for various online services. As many providers offer services, software agents running on mobile devices can utilize the device’s spatial and temporal properties when they recommend services of a third party agent. For example, physical location and distance can be used to rank the relevance of the service to the user. This kind of recommendation can produce a reputational image of third

party agents, contributing to a trust relationship. The paper **“CALoR: Context-Aware and Location Reputation Model in AmI Environments”** by Venturini et al. reports on the development of a reputation system that takes into account spatial and temporal properties of interactions for ambient intelligence environments.

From a different perspective, spatial relevance is one of the primary types of relevances that determine whether a context is spatially related to the user or not. Spatial relationships such as metric, directional, and topologic relations can be utilized for detecting spatially relevant contexts. These relationships are examined in the paper **“Spatial Relevancy Algorithm for Context-aware Systems (SRACS) in Urban Traffic Networks using Dynamic Range Neighbor Query and Directed Interval Algebra”** by Neysani Samany et al., in which a model is proposed to be responsive to the velocity and direction of the user to introduce spatially relevant contexts according to their arrangement in space.

Many artificial intelligence applications that focus on the needs of a user require information about the activities being performed by the user. Activity recognition techniques have become robust but rarely scale to handle more than a few activities. They also rarely learn from more than one smart home data set because of inherent differences between labeling techniques. In order to move to the next level, the techniques need to be improved for generalizability and scalability. The paper **“Learning a Taxonomy of Pre-**

**defined and Discovered Activity Patterns”** by Krishnan et al. investigates a data-driven approach to creating an activity taxonomy from sensor data found in disparate smart home datasets. The paper analyzes how the taxonomy can be used to scale activity recognition to a large number of activity classes and training datasets.

Among the many challenges of research in the domain of elderly care are the selection of sensors and the secure storage of data. There are other important issues such as reliable data collection, acceptance of sensor systems into the inhabitant’s life, and ensuring that the sensor system does not create hazards in the house. The paper **“Towards a monitoring smart home for the elderly: One experience in retrofitting a sensor network into an existing home”** by Moretti et al. reports on the experiences of retrofitting a set of wireless sensors into the house of an elderly person living alone and an exploration of some of the data integrity issues faced.

## 2. Upcoming issues

The next issue of JAISE will be a Thematic Issues on *Ambient and Smart Component Technologies for Human-Centric Computing* to be published in January 2014, followed by a regular issue in March.

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