

# Preface

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This issue of JAISE is a regular issue consisting of 8 articles. Review of these articles were supervised by our associate editors Alex Mihailidis, Carles Gomez, Vincent Tam, Ahmad Lotfi, Andrea Prati, and Stefano Chessa, 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.

## 1. This issue

Activity recognition plays a key role in providing activity assistance and care for users in smart homes. The paper **“Human Activity Recognition using Multisensor Data Fusion based on Reservoir Computing”** by Palumbo et al. presents a near realtime activity recognition system for a set of common daily activities using the data sampled by sensors embedded in a smartphone carried by the user and the received signal strength values obtained from worn wireless sensor devices and from sensors deployed in the environment. A decision tree based on multisensor data-stream is introduced in the paper to fuse data from the different sensor types. The paper examines applications in Ambient Assisted Living (AAL) based on the proposed technique.

In AAL environments, a key issue is to know the location of a user in order to provide the required services quickly and efficiently. A good location system is able to locate an individual in the shortest time with acceptable accuracy. The paper **“Fingerprint Indoor Location Simulator for AAL”** by Gomez et al. focuses on location systems based on fingerprint method. The various processes carried out in the fingerprint ap-

proach and the many related parameters of the localization process have been included in a simulator to allow a realistic evaluation of these solutions in a comparative study.

Even though a number of ICT solutions have been introduced to increase quality of life of older adults and persons with special needs, there is often a mismatch between the offered services and the required user-friendly attributes, hindering their use and reducing their utility. One of the most important factors for such solutions is the ability to provide accessible, attractive and user-friendly interaction. The paper **“A comparative study of systems for the design of flexible user interfaces”** by Mayer et al. proposes a framework to examine the suitability of user interfaces for AAL solutions. The framework introduces a multi-step adaptation process, the concept of context of use, and the distinction between adaptable and adaptive user interfaces.

Over the past decade different approaches for camera-based fall detection have been proposed with the aim of reliably alerting caregivers about an elderly person’s accidental fall at home. These algorithms have been evaluated almost exclusively using brief segments of video data captured in artificial environments, often under optimal imaging conditions, and with falls simulated by actors. The paper **“Camera-based fall detection using real-world versus simulated data: how far are we from the solution?”** by Debard et al. proposes a fall detection algorithm and reports the results of testing this and a number of other existing algorithms on simulated and real-life data. The real-life data was collected from the home of several elderly participants in various settings. The paper concludes that using realistic datasets that include long video

recordings and a broad range of activities is essential to reveal the weaknesses of any fall detection algorithm.

Nowadays, it is technologically feasible to augment an interior or closed room by creating virtual windows. The paper “**Design and user experience assessment of Kinect-based virtual windows**” by Besada et al. describes a system designed to virtually emulate a window by using Kinect-based tracking, prerecorded videos, and standard hardware. The Virtual Window System (VWS) is able to control one or two synchronized windows and simulate the perspective changes on the image seen by the user as the user moves. It employs user tracking filters and image transformation mathematics to render a virtual window which reacts to the location and movements of the viewer.

In a camera network, objects are tracked by each camera using any of conventional algorithms and their tracks are extracted. The extracted tracks are the inputs to a data fusion module to find the trajectory of the different moving objects in space. The paper “**Variational method for wide area surveillance**” by Pazouki and Rahmati proposes a method to associate the corresponding tracks of an object between the camera reports and develop the persistent trace of all the tracked objects. The association problem is formulated and solved using a variational energy function, which is based on the appearance and motion model of the objects.

The recent advent of ambient intelligence is enabled by parallel technological advancements in sensing, context recognition, embedded systems and communications. The paper “**Analysis of the data transportation multi-hop network for an intelligent environment**” by Etxaniz et al. focuses on the communication issues of embedded systems, particularly the latency Quality of Service (QoS) metric and the multi-hop communications with the Bluetooth standard, to examine the viability of communications between embedded systems deployed in AmI environments and applications.

Gestational Diabetes Mellitus (GDM) is a condition affecting a small percentage of pregnant women due to increased resistance to insulin caused by the growth of the fetus. Such a condition serves as an indicator of the insurgence of diabetes type 2 (DT2) later in life. The paper “**An Expert Personal Health System to Monitor Patients Affected by Gestational Diabetes Mellitus: A Feasibility Study**” by Stefano et al. reports on the results of a feasibility study of a Personal Health System (PHS) on a population of target users to evaluate the potential to improve the life of the users by allowing a better communication of their physiological values to the caregivers. The system is based on a multi-agent model and employs a mobile application to interact with the user and a web-based access system for the caregivers.