

Preface

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1. This issue

This issue of JAISE is composed of five papers. The review process for the papers in this issue was supervised by our editors Kevin Wang, Marc Bohlen, Ahmad Lotfi, and Wei Chen, whom we thank for their service. The last pages of this issue include one PhD defense exam report.

The Internet of Things (IoT) market has been rapidly advancing with a wide variety of smart products coming to the consumer market regularly. Many of these products claim to offer similar services, but with different features which may be confusing to the average user when making a selection between them. In order to reduce purchase risk, many consumers rely on online product reviews, which do not often reflect the effective quality of the products. The paper **“A structured and user-friendly method to conduct an all-round evaluation of Smart Products”** by Pappetti et al. proposes a method to objectively evaluate smart products in a systematic way to support the consumer in selecting the products that best satisfy their needs. The method accounts for a set of features such as connectivity, cost, ease of installation and configuration, interoperability, reliability, and smart features, and has been implemented on three different product categories: body scales, blood pressure monitors, and activity trackers.

Intelligent service robots are being developed for emerging areas in human-friendly interactive applications. These robots are expected to be operated by non-expert users. Humans prefer to use voice instructions for exchanging ideas with each other. Such voice instructions often include distance and direction related language descriptors that are fuzzy in nature. Therefore, as a human-friendly feature, service robots should be capable of interpreting the meaning of such

fuzzy notions in language instructions in order to enhance the interaction between the robots and their users. The paper **“Improving the understanding of navigational commands by adapting a robot’s directional perception based on the environment”** by Muthugala and Jayasekara proposes a method to interpret the directional notions in movement and position navigational commands by considering the fuzziness associated with the linguistic notions. A fuzzy inference system has been developed in order to adapt a robot’s perception of fuzzy directional notions based on the environment. The paper reports on experiments conducted in an artificially created domestic environment.

The evolution of cloud computing and Internet of Things (IoT) paradigms has made real-time monitoring of patients by remote medical professionals feasible. In such situations the patient data is stored on centralized healthcare servers, from where it can be accessed by a medical professional. However, this makes the patient privacy a critical issue due to the open wireless environment. Many authentication schemes for healthcare services have been proposed, but most of these cannot achieve complete security requirements. They also do not consider the issue of how a medical professional can access the server data over the cloud. The paper **“A secure multi-factor ECC based authentication scheme for Cloud-IoT based healthcare services”** by Dhillon and Kalra proposes a multi-factor authentication scheme based on elliptic curve cryptography which allows only a legal medical professional to access the patient’s medical data stored on the cloud server. Web-based tools are used for formal analysis of security against active and passive attacks.

Process mining is a research field focused on the analysis of event data with the aim of extracting insights related to dynamic behaviour. Applying pro-

cess mining techniques on data from smart home environments has the potential to provide valuable insight into the occupant habits and to contribute to ambient assisted living solutions. Finding the right event labels to enable the application of process mining techniques is a complex task, as simply using the triggering sensor as the event label results in models that overgeneralize. The paper **“Generating time-based label refinements to discover more precise process models”** by Tax et al. proposes a framework for the automated generation of label refinements based on the time attribute of events, allowing for distinguishing behaviourally different instances of the same event type based on their time attributes. The paper includes a case study with real-life smart home event data that uses automatically generated refined event labels in process discovery, providing specific and more insightful process models.

Hazardous accidents associated with the complex environment of underground mines requires constant monitoring of gas density for improved safety. The paper **“Arduino-based intelligent gases monitoring and information sharing Internet-of-Things system for underground coal mines”** by Jo et al. proposes to integrate Arduino-based sensors, Internet-of-Things (IoT), and cloud computing for near real-time mine environment monitoring, ventilation control, emergency

communications and information sharing, aiming for a synchronous and cost-effective way to enhance underground mine safety. The proposed system has been validated in an actual environment of an underground coal mine using Arduino-based sensors of CO, CH₄, and CO₂, and the design of the system has followed the open-source protocol.

2. Upcoming issues

The following is the list of upcoming issues of JAISE:

- May 2019: Thematic Issue on a selected topic from Intelligent Environments 2018
- July 2019: Regular Issue
- September 2019: Thematic Issue on “Wearable Computing Techniques for Intelligent Health”
- November 2019: Regular Issue
- January 2020: Thematic Issue on “Cognitive Learning-based IoT Systems”

More information on the call for papers for future thematic issues is available on the webpage of JAISE at:

<http://www.iospress.nl/journal/journal-of-ambient-intelligence-and-smart-environments/>