Context, Intelligence and Interactions for Personalized Systems.

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1 Introduction

This special issue on Context, Intelligence and Interactions for Personalized Systems provides a snapshot of the latest research activities, results, and technologies and application developments focusing on the smart personalised systems in Ambient Intelligence and Humanized Computing. It is intended for researchers and practitioners from artificial intelligence (AI) with expertise in formal modeling, representation and inference on situations, activities and goals; researchers from ubiquitous computing and embedded systems with expertise in context-aware computing; and application developers or users with expertise and experience in user requirements, system implementation and evaluation. The special issue also serves to motivate application scenarios from various domains including smart homes and cities, localisation tracking, image analysis and environmental monitoring. For solution developers and providers of specific application domains, this special issue will provide an opportunity to convey needs and requirements, as well as obtain first-hand information on the latest technologies, prototypes, and application exemplars.

2 Contributions of this issue

This special issue consists of 12 high-quality research papers selected from a large number of submissions (126), each going through at least two rounds of strict peer reviews and significant consolidation. These papers represent the latest advances and development of research in the general context of Ambient Intelligence and Humanized Computing for smart human-machine systems.

The research topics covered in this special issue are wide-ranging, including context modelling and inference for smart environments (Alegre-Ibarra et al., 2018; Mulero et al., 2018; Nakahara and Beder, 2018), localization tracking (Chen et al., 2018; Xin et al., 2018), optimization of energy consumption (Hammoud et al., 2018), behavior mining and activity recognition (Han et al., 2018; Zhang et al., 2018), image analysis (Wu et al., 2018), social event mining and mobile crowd sensing (Pan et al., 2018; Park, 2018), and behavior-based privacy (Tao et al., 2018).

The application areas involved are diverse, including assistive living in smart environments (Alegre-Ibarra et al., 2018; Mulero et al., 2018; Nakahara and Beder, 2018; Zhang et al., 2018), indoor and outdoor localization (Chen et al., 2018; Han et al., 2018; Xin et al., 2018), crowd-sourced big data analysis (Pan et al., 2018; Park, 2018), privacy (Tao et al., 2018), energy usage optimization (Hammoud et al., 2018) and image segmentation (Wu et al., 2018). Details for each item are briefly described below.

While paper 'A Context-Aware and Self-Adaptive Offloading Decision Support Model for Mobile Cloud Computing System' (Nakahara and Beder, 2018) by Flávio Akira Nakahara and Delano Medeiros Beder presents a context-aware and self-adaptive offloading decision support model based on application's time execution and energy consumption for decision-taking estimation to improve system execution; paper 'Towards Ambient Assisted Cities Using Linked Data and Data Analysis' (Mulero et al., 2018) authored by Rubén Mulero *et al.* investigates two methods to help Ambient Assisted Cities to deal with Mild Cognitive Impairments and Frailty. These methods discuss a city-wide context manager and an individual care monitoring dashboard. In the paper 'Perspectives on engineering more usable context-aware systems' (Alegre-Ibarra et al., 2018) authored by Unai Alegre-Ibarra *et al.*, the state-of-the-art conceptualisation of context was reviewed and a combination of revised and new definitions was introduced.

While paper 'FreeSense: Human-Behavior Understanding using Wi-Fi Signals' (Xin et al., 2018) authored by Tong Xin *et al.*, presents a method for human indoor identification using Wi-Fi CSI signals. Influence patterns for human detection are captured by combining Principal Component Analysis, Discrete Wavelet Transform and Dynamic Time Warping techniques; paper 'A Three-stage Online Map-Matching Algorithm by Fully Using Vehicle Heading Direction' (Chen et al., 2018) by Chao Chen *et al.* propose a three stage online map-matching algorithm called SD-Matching for trajectory data matching. SD-matching takes the vehicle heading direction in consideration in every stage.

The paper 'Adaptive Power Switching Technique For Ultrasonic Motion Sensors' (Hammoud et al., 2018) by Abbass Hammoud *et al.* presents an adaptive power switching technique for ultrasound motion sensors for transmitter power level optimization to decrease energy consumption. Furthermore, an automatic sensing method can detect changes to trigger the process.

While in 'Driving Behavior Modeling and Evaluation For Bus enter and leave Stop Process' (Han et al., 2018) authored by Qingwen Han *et al.*, special driving areas are distinguished by critical zone and a driving behavior model is constructed by using the bus enters and leave bus stop process. The approach includes driving behaviour establishment, good driving behavior discovery and current driving behavior evaluation; in paper 'Students Performance Modeling Based on Behavior Pattern' (Zhang et al., 2018) authored by Xi Zhang *et al.* a system modelling students' performance was established by using smart card readings to detect behaviour patterns and further extract statistical and relevance features for the performance modelling.

In the paper 'Grading Glioma by Radiomics with Feature Selection Based on Mutual Information' (Wu et al., 2018) authored by Yaping Wu *et al.* , a prediction framework is proposed for grading of glioma based on radiomics. The system integrates a semi-automatic segmentation method, a de-redundancy algorithm, an elastic net feature selection and a linear prediction model.

While paper 'A Resource Recommender System based on User History and the Psychological Model' (Park, 2018) authored by Jonghyun Park, investigates a customized resource recommendation system for mobile device users, reducing reasoning time and increase user satisfaction by a DISC physiological model; paper 'A Survey of RDF Managment Technologies and Bechmark Datasets' (Pan et al., 2018) by Zhengyu Pan *et al.* discusses the state-of-the-art Resource Description Framework storage and query technologies, and introduced and compared benchmark datasets.

The paper 'Gait based biometric personal authentication by using MEMS inertial sensors' (Tao et al., 2018) by Shuai Tao *et al.* presents a personal authentication method for MEMS inertial sensors in shoes for gait analysis. To distinguish different users a probabilistic neural network is used.

Acknowledgement This special issue was only possible by the help from various collaborators, which we would like to thank. Our gratitude goes to the Editor in Chief of the Journal of Ambient Intelligence and Humanized Computing, Prof. Vincenzo Loia, for his advice and support during the whole process of publication. Furthermore, we would like to thank the reviewers which took time to thoroughly review the papers and provide valuable feedback. We are very grateful for the contributions of all authors, without whom the presented special issue would not have been possible.

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