Editorial

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Biographical notes: Neil Y. Yen is an Associate Professor at the University of Aizu, Japan. He received Doctorates in Human Sciences at Waseda University, Japan, and in Engineering at Tamkang University, Taiwan. He has actively involved himself in the international activities, including editorial works in journals and books, society services in academic conferences sponsored by IEEE/ACM/IET, etc., and devoted himself to discover advanced and interesting research directions. His research interests are now primarily in the scope of big data and human-centric computing.

Hai Jiang is a Professor in the Department of Computer Science at Arkansas State University and the Director of the Secure & Scalable Systems Laboratory (SSS). He received his PhD in the Department of Computer Science at Wayne State University, Detroit, Michigan. His research interests lie in fields of parallel & distributed systems, computer & network security, high performance computing & networking, and modelling & simulation.

Eiko Yoneki is a Research Fellow leading Data Centric Systems Group in the University of Cambridge Computer Laboratory, Systems Research Group. She received her PhD from the University of Cambridge, 2007 (Data Centric Asynchronous Communication) and a Postgraduate Diploma in Computer Science from the University of Cambridge in 2003. Previously, she has spent several years with IBM (USA, Japan, Italy and UK) working on various networking products.

Advances in smart object (i.e., sensor) development have prompted a dramatic change in our daily lives. We are currently surrounded by these objects, and it is never difficult to find that a considerable number of contexts (or ubiquitous contexts), which are considered efficient and effective in providing insights into specific realms, may be derived during the process. This phenomenon, meanwhile, also raises emerging issues in regard to well management of ubiquitous contexts. Management is not merely a technology that prompts ubiquitous search but also the basis of a wide variety of applications and services, such as recommendation, advertising and personalisation.

Fortunately, along with the growth of ubiquitous-related technologies, more and more resources have also become available, such as associated metadata, social information, etc. In addition, collaborative tagging, a representative behaviour of the Web, enables the availability of tags for a large amount of ubiquitous contexts on the internet. These aids have provided opportunities to tackle the difficulties of large-scale ubiquitous contexts management.

This special issue concentrates on the research results in the fields of ubiquitous computing, awareness science and engineering, wireless sensor network, and their intersection towards development of well-being in human

society. This special issue, during the period, receives around 45 submissions from over 10 countries. In addition to the open calls from public researchers, those high quality and selected papers, with their substantially-extended versions, from the *IEEE International Conference on Systems, Man, and Cybernetics (SMC'14)*; and the *IEEE International Symposium on Independent Computing (ISIC'14)* were included. After a rigorous and competitive referee process, nine papers with significant contributions were accepted for publication.

The first paper entitled 'Spatial query processing for skewed access patterns in non-uniform wireless data broadcast environments' by Shen and Jian discusses an issue concerning the development of location-based services (LBSs) via wireless data broadcast. A skewed spatial index considering clients skewed access patterns in the non-uniform wireless broadcast environments was proposed. The index information considering the non-uniform broadcast is interleaved with the spatial objects on the wireless channel to support efficient access. The experiment reveals that the method outperforms the multi-levelled air index scheme and its high feasibility.

The second paper entitled 'Local fitness landscape from paired comparison-based memetic search in interactive differential evolution and differential evolution' by Pei and Takagi discusses an issue concerning triple comparison-based interactive differential evolution (IDE) algorithm and differential evolution (DE) algorithm. The comparison of target vector and trial vector supports a local fitness landscape for IDE and DE algorithms to conduct a memetic search. This work was compared with canonical IDE and triple comparison-based IDE implemented by opposite-based learning and apply several statistical tests to investigate the significance of the proposed algorithms. Results show significantly better optimisation performance than the one arising from the evaluation results.

The third paper entitled 'Social computing for internet addiction disorder analysis from a psychological perspective' by Huang et al. concentrates on the issue of how people obtain psychological satisfaction through internet usage, and to explore how such usage behaviour can lead to the development of a sense of dependence. This paper distributed paper-based and electronic questionnaires, receiving a total of 502 valid responses for a valid response rate of about 88%. Results were found that emotional state varies with behaviour and age, leading to different patterns of personal expression and creativity. In addition, the findings are found consistent with Maslow's hierarchy of needs in that people only seek to address their higher-order needs once their lower-order needs are satisfied.

The fourth paper entitled 'Crowdsourcing-based timeline description of urban emergency events using social media' by Xu et al. concentrates on the relationship among urban events, especially those emergent ones, and the contents on social media. This paper, in order to describe the timeline of real time urban emergency events, proposes a new web mining task timeline description is proposed. Firstly, the related information of an urban emergency event is extracted from Weibo messages. Secondly, the valid message including the semantic or spatial information is detected in this step. Thirdly, detected valid messages are used to building the timeline description.

The fifth paper entitled 'A rapid mining model for extracting sparse distribution association semantic link from large-scale web resources' by Zhang et al. concentrates on the development of new method for efficiently represent the semantic relations among contexts on the internet. This paper proposes a rapid mining model for extracting sparse distribution k-ASL from large-scale web resources. First, the time validity for three types of k-ASL is analysed to clear and define their semantic characteristic. Second, three existing problems for mining sparse distribution k-ASL are presented, which aim to analyse why this kind of k-ASL are easily discarded. After that, we present the theoretical foundation including two hypothesis and some corollaries for mining sparse distribution k-ASL. Further, the rapid mining model for extracting sparse distribution k-ASL is proposed, which is based on the presented theory and set computation such as Difference computation, Union computation.

The sixth paper entitled 'Energy efficient data gathering for WSN-based context-aware applications' by Pan and Jing concentrates on the scheduling problem found on open wireless sensor networks. This paper designs a two-phase scheme to support both regular and event data reporting, and the goal is to minimise regular report, event detection, and event reporting latencies. In the designed scheme, the first phase assigns each node one regular slot and several event slots by considering how to reduce above three kinds of latencies. In the second phase, nodes operate in a distributed manner to sense and report regular or event data.

The seventh paper entitled 'Development of an MCNP assisted modelling software based on OpenCasCade' by Zhou et al. identifies the relationship among contexts and assisted modelling software development. Authors developed on OpenCasCade geometry engine. It not only achieves the general function of 3D modelling software, but also performs the conversion from CAD models into MCNP model directly. Furthermore, through deep research and further developing on OpenCasCade, MAMS implements some advanced functions required by specific users, such as auxiliary plane decomposition, setting the scope of surfaces number in INP file according to user input. MAMS has the STEP database as the native storage.

The eighth paper entitled 'Design of a hybrid model for dynamic engagement behaviour analysis in a cloud-based environment' by Chen et al. identifies information system characteristics as triggers to explore the dynamic and iterative nature of engagement behaviour by multi-criteria decision-making analysis. The main findings can provide helpful guidance for TPET managers decision-making regarding the enhancement of members engagement behaviour and promotion of the sustainable development of the community, and ultimately improve the quality of teaching to create more innovative educational value for students.

The ninth paper entitled 'Optimal deployment and traffic flows in mobile mesh network after a disaster' by Wang and Cheng focuses on the problems of communication-demand-oriented deployment method (CDODM) and a global-data-traffic routing optimisation method (GTFROM) for a disaster. The main contributions are

- formalisation and optimisation of computation transmission cost in a Voronoi area in CDODM

- formalisation and optimisation traffic flows in GTFROM

- implementation and evaluation in Matlab and NS3.

User satisfaction calculated based on recorded throughput in NS3 can be enhanced clearly in the proposed solutions. In scalability study, the proposed methods works well, with changing range of disaster areas, number of MMRs and user communication demands.

Our special thanks go to Professor Yuh-Shyan Chen who is the Editor-in-Chief of *International Journal of Ad Hoc and Ubiquitous Computing* and all editorial staffs for their valuable supports throughout the development process of this special issue. We would like to thank all authors and to the reviewers for their contributions and help in the process too.