

Welcome message from the Editor-in-Chief

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On behalf of the Editorial board, we welcome you to the third issue of the ICST Transactions on Context-Aware Systems and Applications. In this issue, we present four selected papers that span various aspects of context-aware systems and applications, and an introduction to the book titled "Autonomic Networking-on-Chip: Bio-Inspired Specification, Development, and Verification".

This issue will serve as a reference material for researchers, scientists, professionals and students in computer science and computer engineering as well as developers and practitioners in computing and networking systems design by providing them with state-of-the-art research findings and future opportunities and trends. These papers include some recent advances in context-awareness reflected in this issue. In particular, the issue covers various themes of context-awareness as follows:

Paper 1 by J. R. Santiago, S. J. Samuel and R. Sawn reports that even amidst the hustle and bustle of busy lives, numerous people dream of playing a musical instrument. Unfortunately, many may never get a chance to touch one. But this doesn't stop them from "air drumming" or playing "air guitar" passionately while listening to their favorite tunes. To encourage this passion for music, especially in the absence of a real instrument, authors introduce to Virtual Air Guitar. This application allows users to showcase their guitar skills, regardless of their knowledge of playing a real guitar. It uses color tracking to detect inputs and a sound module incorporating the Karplus Strong algorithm to generate musical notes as an output. As a result, a simple webcam and brightly colored gloves are required to use the application. This application has enormous potential as a base for interactive guitar games, teaching music, and of course, to compose guitar based songs.

Paper 2 by Yuichi Watanabe, Shinsuke Matsumoto, Sachio Saiki and Masahide Nakamura reports that in the conventional context-aware services of the home network system (HNS), every context has been defined by current (or recent) situations only. Considering past situations in a house would significantly extend the expressive power of the context-aware services. In this paper, authors propose a new type of context, called log context, by using house log of the HNS, extensively. The log context is defined with both the current and past situations, where the current situation is obtained by sensors or device status of the HNS while the past situations are derived by queries to the house log. Authors also develop a system that can derive the log contexts within an actual HNS. To manage individual log contexts efficiently, the system is designed by four layers: application layer, log context layer, log query layer, and DB connector layer. To evaluate the execution performance of the system, authors have conducted an experiment which measures execution time of some variety of log queries.

Paper 3 by Boudjemaa Boudaa, Slimane Hammoudi, Abdelkader Bouguessa, Leila Amel Mebarki and Mohammed Amine Chikh reports that modern human is getting more and more mobile having access to online services by using mobile cutting-edge computational devices. In the last decade, the field of context-aware services had led to emerge several works. However, most of the proposed approaches have not provided clear adaptation strategies in case of unforeseen contexts. Dealing with this last at runtime is also another crucial need that has been ignored in their proposals. This paper aims to propose a generic dynamic adaptation process as a phase in a model-driven development life-cycle for context-aware services

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using the MAPE-K control loop to meet the runtime adaptation. This process is validated by implementing an illustrative application on FraSCAti platform. The main benefit of the proposed process is to sustain the self-reconfiguration of such services at model and code levels by enabling successive dynamic adaptations depending on the changing context.

Paper 4 by Carla Passiatore and Pietro Camarda focuses on cognitive 802.22b Wireless Regional Area Networks (WRANs). In particular, a protocol, named inter intra-resource sharing algorithm (2I-RSA), is presented to address the problem of self-coexistence for WRANs and secondary users of the WRAN. The purpose of the proposed resource sharing mechanism is to allow P2P communications avoiding interference among users of the same network or of neighbouring cells, optimizing, at the same time, fairness and network capacity.

Paper 5 by Phan Cong Vinh is an introduction to the book titled “Autonomic Networking-on-Chip: Bio-Inspired Specification, Development, and Verification” edited by himself and published by CRC Press in 2011 to readers in the field of computing. Despite the growing mainstream importance and unique advantages of autonomic networking-on-chip (ANoC) technology, this is among the first books to evaluate research results on formalizing this emerging NoC paradigm, which was inspired by the human nervous system. The third book in the Embedded Multi-Core Systems series from CRC Press, this is an advanced technical guide and reference composed of contributions from prominent researchers in industry and academia around the world. A response to the critical need for a global information exchange and dialogue, it is written for engineers, scientists, practitioners, and other researchers who have a basic understanding of NoC and are now ready to learn how to specify, develop, and verify ANoC using rigorous approaches.

For the preparation of this third issue we would like to acknowledge the work of all our Editors, reviewers and authors who have positively supported this publication. We will be happy to receive from our readers any suggestions, including possible proposals for future special issues, which may contribute to further maintain the high scientific quality and relevance of this journal.

We hope you will find this third issue provoking for your research in the field of context-awareness and being useful to your future work.

About the Editor-in-Chief



Phan Cong Vinh received a PhD in computer science from London South Bank University (LSBU) in the United Kingdom, a BS in mathematics and an MS in computer science from Vietnam National University (VNU) in Ho Chi Minh City, and a BA in English from Hanoi University of Foreign Languages Studies in Vietnam. He finished his PhD dissertation with the title *Formal Aspects of Dynamic Reconfigurability in Reconfigurable Computing Systems* supervised by Prof. Jonathan P. Bowen at LSBU where he was affiliated with the Centre for Applied Formal Methods (CAFM) at the Institute for Computing Research (ICR). He joined research with Dr. Tomasz Janowski at the International Institute for Software Technology (IIST) in Macao SAR, China, as a fellow in 2000. At present, he is an Associate Professor of Nguyen Tat Thanh University (NTTU) to take on the responsibility of a senior research scientist. He has been author or co-author of many refereed contributions published in prestigious journals, conference proceedings or edited books. He is the author of a book on computing science titled “*Dynamic Reconfigurability in Reconfigurable Computing Systems: Formal Aspects of Computing*” (VDM, 2009); editor of two titles, “*Autonomic Networking-on-Chip: Bio-Inspired Specification, Development and Verification*” (CRC Press, 2012) and “*Formal and Practical Aspects of Autonomic Computing and Networking: Specification, Development and Verification*” (IGI Global, 2011); editor of Special Issues, “*Context-Awareness of Mobile Systems: Models, Algorithms and Applications*” (Springer MONET, 2012 (indexed in SCIE)) and “*Advances in Autonomic Computing: Formal Engineering Methods for Nature-Inspired Computing Systems*” (Springer TCS, 2012). He has served on many conference program committees and has been general or technical (co)chair and (co)organizer of several international conferences such as ICCASA and ICTCC. His research interests center on all aspects of formal methods, nature of computation and communication, and applied categorical structures in computer science.