

## Welcome message from the Editor-in-Chief

Phan Cong Vinh\*

Faculty of Information Technology at Nguyen Tat Thanh University,  
300A Nguyen Tat Thanh street, Ward 13, District 4, Ho Chi Minh City, Vietnam

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On behalf of the Editorial board, we welcome you to the second issue of the ICST Transactions on Context-Aware Systems and Applications. In this issue, we present three selected papers that span various aspects of context-aware systems and applications, a FoCAS project's interview with Editor-in-Chief at the 2nd ICCASA in 2013 and an introduction to the book titled "Formal and Practical Aspects of Autonomic Computing and Networking: 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 is a FoCAS project's interview with Editor-in-Chief at the 2nd ICCASA in 2013, where he shared with Prof. Giacomo Cabri, a FoCAS project's member, his reflections on collective adaptive systems and applications. Editor-in-Chief answered to the four questions highlighting his current role, the important topics in the field of collective adaptive systems, the specific challenges to be faced and underlining a long-term impact of this research in terms of applications.

Paper 2 by Naseem Ibrahim, Vangular Alagar and Mubarak Mohammed reports that in service-oriented systems a service invariably is bound to a contract. This contract includes the functionalities and quality of services guarantees that the provider can make. But such guarantees are not absolute. A service cannot guarantee its contract in all situations. It can only guarantee its contract in a predefined set of conditions. These

conditions are usually related to the context of the service provider and requester. Yet, most of service-oriented applications use only service functionality as the basis of providing services and building system compositions. To remedy this situation, in this paper both functionality and contract of a service are integrated into a single concept, called *ConfiguredService*, and formalized as a higher-order data type. The service part that includes the functionality, non-functional properties, service parameters, and data of the service requester, is loosely coupled to the contract part that includes trustworthiness claims, legal and business rules governing the service provision, and the context information pertaining to the provider and receiver. This loose coupling allows the creation of many *ConfiguredServices*, which share the same functionality but possess different contract parts. To facilitate dynamic service adaptation, the paper introduces a syntax and semantics for extending or modifying a *ConfiguredService*.

Paper 3 by Hong Anh Le and Ninh Thuan Truong reports that context awareness is a computing paradigm that makes applications responsive and adaptive with their environment. Formal modeling and verification of context-aware systems are challenging issues in the development as they are complex and uncertain. This paper proposes an approach to use a formal method Event-B to model and verify such systems. First, authors specify a context aware system's components such as context data entities, context rules, context relations by Event-B notions. In the next step, authors use the Rodin platform to verify the system's desired properties such as context constraint preservation. It aims to benefit from natural representation of context awareness concepts in Event-B and proof obligations generated by refinement mechanism to ensure the correctness of systems. The paper illustrates the use of this approach on a scenario of an Adaptive Cruise Control system.

\*Corresponding author. Email:pcvinh@ntt.edu.vn

Paper 4 by Phuong T. Nguyen, Volkmar Schau and Wilhelm R. Rossak reports that communication is considered as a building block for mobile agent systems. In highly dynamic networks, thanks to environmental stimuli such as changes in connection quality and network topology, performance of communication between mobile agents may be degraded considerably. With focus on attaining fault tolerance and reliability, authors propose a context-aware architecture for agent communication model inspired by the honey bee colony. To validate the hypothesis, a software prototype has been designed and implemented according to the proposed mechanism. Encouraging experimental results on a test system show that this approach brings benefits to a colony of agent platforms.

Paper 5 by Phan Cong Vinh is an introduction to the book titled “Formal and Practical Aspects of Autonomic Computing and Networking: Specification, Development and Verification” edited by himself and published by IGI Global in 2011 to readers in the field of computing. The book serves as a comprehensive and essential reference on autonomic computing and networking (ANC) and is intended as a textbook for senior undergraduate and graduate-level courses. It can also be used as a supplementary textbook for undergraduate courses. The book is a useful resource for the students and researchers to learn ACN. In addition, it will be valuable to professionals from both the academia and industry and generally serves instant appeal to the people who would like to contribute to ACN technologies.

For the preparation of this second 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 second 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 a member 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.