
Editorial

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Biographical notes: Youakim Badr is currently an Associate Professor in the Computer Science Department at INSA-Lyon, France. In his past research, he has worked extensively on enterprise modelling and collaborations. His research interests include security, dynamic and autonomic architectures. His current academic research interests include systems in both the service sector and ICT. In particular, he studies the ecosystem of services and the multidisciplinary modelling approach to design service computing for ubiquitous and self organised systems. He is vigorously involved in a series of international conferences and serves editorial boards of several international journals. He has also been guest editor for journal special issues and serves as a reviewer for prestigious conferences and journals.

Ajith Abraham received his PhD from Monash University, Melbourne, Australia in 2001. He works in a multi-disciplinary environment involving machine intelligence, network security, sensor networks, e-commerce, web intelligence, web services, computational grids, data mining and applied to various real world problems. He has authored/co-authored over 500 publications. He co-chairs the IEEE Systems Man and Cybernetics Society Technical Committee on Soft Computing. Currently he is also coordinating the activities of the Machine Intelligence Research Labs (MIR Labs), which has members from over 45 countries. Besides the Editor in Chief of *International Journal of Autonomic Computing*, he serves the editorial board of several reputed international journals and has also guest edited 35 special issues on various topics.

Nowadays, autonomic systems are emerging as a promising computing approach to design self-configuring systems that dynamically respond to changes. An autonomic system is able to reconfigure itself under unpredictable events that might cause some of its parts to malfunction. Several works have dealt with the infrastructure of autonomic architectures and the design of software components implementing autonomic self-* properties. However, few initiatives seek to extend the autonomic behaviour to include users and their applications. How will autonomic technologies help users in their

interactions with the system? Are there business and management applications that can benefit from the autonomic paradigm? If so, how should autonomic applications be design to support non-deterministic behaviour of user actions? How do these technologies help to handle the semantics of different application domains?

This special issue attempts to address these issues and includes extended and revised papers from the *IEEE International Conference on Soft Computing as Transdisciplinary Science and Technology (CSTST 2008)* held in Cergy-Pontoise, Paris in 2009. After a very tight review process, we have selected three papers to include in this special issue as follows.

The first paper, ‘A rule-driven approach for architectural self adaptation in collaborative activities using graph grammars’, is authored by I. Bouassida Rodriguez, K. Drira, C. Chassot, K. Guennoun and M. Jmaiel. In this paper, the authors provide generic and scalable solutions to tackle the self-adaptability property of collaboration support systems. Based on the graph theory, they propose an original approach by defining architectures as graph grammars where vertices correspond to deployment nodes, software services and internal components. In dynamic and evolving environments, the graph transformation rules deploy new architecture instances in response to changes. Their approach verifies instance architectural constraints preservation and supports formal verification for correctness and safety proofs. Finally, they apply their approach to design a self-configuring Crisis Management System (CMS) and implement a graph rewriting system that ensures scalable management and automated configurations.

In the second paper, K. Barbar presents ‘Automatic generation of XML-based editors for autonomic systems’. The author pays particular attention to the autonomic behaviour of data-entry forms and graphical interfaces in autonomic architecture. Based on contextual information and data-entry devices, the author introduces a generic autonomic system able to generate DTDs describing relevant context and data-entries. A novel DTD compiler is proposed by extending attributed context-free grammar to generate web forms and editors automatically with respect to the predefined DTD. This contribution introduces a high-level grammar that supports all possible DTD interpretation by various programming languages. The compiler, which is illustrated with production rules and semantic attributes, demonstrates important features and promising applications in autonomic environments.

In the last paper, ‘An ontology-driven approach for collaborative ubiquitous systems’, G. Sancho, T. Villemur and S. Tazi deal with computer supported collaborative work systems in distributed and ubiquitous environments where collaboration sessions are established spontaneously. They propose an innovative semantic architecture based on ontology, rules and inference engines to govern deployment and adaptation of cooperation models at runtime. The architecture is organised into three layers to enable code reuse and modularity. The collaboration layer particularly enables applications to establish spontaneous and synchronous group collaboration and is managed by a metamodel and a generic collaboration ontology (GCO) representing valid sessions and deployment configurations. The authors also propose generic collaboration rules to process GCO instances to create collaboration metamodel-based instances reflecting the implicit group configuration.

We hope this special issue inspires researchers to extend autonomic infrastructures to build advanced applications not only in ubiquitous environments, but also in business and user-centric domains. Finally, we would like to gratefully thank the reviewers for their valuable comments and the editors-in-chief for their efforts and painstaking editorial work during the preparation of this special issue.