 Advances in mobile and wireless communication are enlarging and enhancing the services offered to and provided by mobile systems at any time and in any place. This new scenario asks for effective solutions to design, develop, and maintain novel ubiquitous services notwithstanding abrupt changes and challenging dependability requirements imposed by the highly heterogeneous and error-prone mobile provisioning environment. However, currently deployed mobile systems are often too inflexible and unable to rapidly adapt to change and this in turn leads to situations where quality-of-service and quality-of-experience are strongly and negatively affected.

To overcome the intrinsic limitations of mobile devices and environments, a variety of research studies have produced a plethora of methods and proof-of-concept prototypes for supporting non-critical applications. However, it is still unclear whether current technologies, methods, and solutions can satisfy the challenging adaptability and dependability requirements of the emerging mobile ubiquitous services, such as mobile commerce, wireless control of robots, healthcare computing, and video-surveillance.

The ambition of this special issue is to tackle above issues by presenting high-quality and ground-breaking contributions to overcome above limitations, including: innovative conceptual models and paradigms for change tolerance; novel mechanisms to model, design, and develop mobile ubiquitous systems; new analytical and simulation tools to measure system ability to withstand faults and to optimally re-adjust to new environments; original middleware infrastructures able to support scalable, maintainable, and cost-effective development of adaptive and dependable mobile ubiquitous services.

To this aim, this special issue collects extended and updated versions of papers accepted for inclusion in the proceedings and presentation at the last 3 editions of the ADAMUS workshop (2007, 2008, and 2009 editions). During the last three years ADAMUS received 26 submissions which were read and evaluated by the program committee members;
the program committee selected 15 papers for inclusion in the proceedings and presentation at the last three editions. The authors of all accepted papers were invited to submit an extended version of their conference paper for possible publication in this special issue. We received 7 submissions and, after an additional in-depth review process, we selected the best 5 papers; in particular, we privileged those submissions that provided more significant extensions with respect to the workshop version of the articles and presented recent findings about various aspects of adaptability and dependability of mobile ubiquitous systems.

All selected papers present support infrastructures for adaptability and dependability in different fields of application. The first two articles address mobile ubiquitous systems, whereas the third and the fourth paper target Wireless Sensor Networks (WSNs). Finally, the last paper is related to the delivery of multimedia services in infrastructure networks.

The first article of this issue is *Adaptation and Dependability and their Key Role in Modern Software Engineering*, by Vincenzo De Florio and Chris Blondia. The authors claim that it is not possible today to conceive software design without explicitly addressing adaptability and dependability. Consequently they propose a novel software engineering paradigm and effective infrastructures to support and ease the development and execution of mobile services and software components meant for wireless and dynamically changing environments.

A similar viewpoint can be found in *Dynamic Reconfiguration of Middleware for Ubiquitous Computing*, by Antonio Corradi, Enrico Lodolo, and Stefano Monti: ubiquitous computing scenarios call for middleware support solutions able to cope with changes in environment conditions and user requirements. Accordingly, the authors propose a novel middleware that is able to automatically reconfigure both application features (content/service adaptation, multichannel content delivery, mobility management, etc.) and non-functional features (naming, persistence, communication infrastructures, etc.), in order to cope with the increasing complexity of heterogeneous ubiquitous and pervasive landscapes. An interesting case study is shown to demonstrate the effectiveness of the proposed middleware when applied on-the-field in a real-world deployment scenario.

Our third article, *iCAAS: Interoperable and Configurable Architecture for Accessing Sensor Networks*, by Catello Di Martino, Gabriele D’Avino, and Alessandro Testa, addresses the relevant issues of supporting easy interoperability and configurability of heterogeneous WSNs, also in order to facilitate their deployment and exploitation by users who are not WSN experts. In particular, the paper reports a practical direct experience with WSNs and proposes an original approach for accessing WSN data based on the emerging Representational state transfer (REST) architectural pattern. The above two original aspects make this paper noteworthy for a broad audience of researchers and practitioners.

The fourth article, *Self-Adapting Event Configuration in Ubiquitous WSN* by Steffen Ortmann and Peter Langendoerfer, tackles another major WSN issue, namely, reliable and efficient event detection in spite of sudden failures and environmental changes. In their article Ortmann and Langendoerfer present a complete fault-event detection concept including all necessary steps from formal event definition to autonomous device configuration and propose an event definition language that allows defining complex events as well as to enhance the reliability by tailor-made voting schemes and application constraints. As demonstrated by reported experimental results, the proposed approach achieves fine-grained event-related fault tolerance with configurable adaptation rate while enhancing WSN maintainability and energy efficiency.

The last paper of this issue, *Optimizing User Quality of Experience through Overlay Routing, Bandwidth Management and Dynamic Transcoding*, by Maarten Wijnants et al., proposes an integrated framework aimed at mitigating
content delivery issues which might undermine the quality of service as it is perceived by end users. The framework comprises overlay routing solutions, as well as last-mile optimization via intelligent proxy components. The authors present also an interesting case study that deals with proxy-based transcoding of H.264/AVC video flows.

The guest editors would like to thank the journal’s associate editor-in-chief, Dr. Vincenzo De Florio, for his guidance and assistance through the whole process. We would like to extend their special thanks to all authors for their outstanding contributions. Last but not least, we would like to thank the reviewers who volunteered their time and energy for the valuable, insightful and timely feedback during the review process that helped us put together this special issue. It was a pleasant experience for us. We hope you will find this special issue informative and useful.

Marcello Cinque and Luca Foschini
Guest Editors
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