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Web Services and Formal Methods

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Revised Selected Papers

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Preface

Web services are fundamental to cloud computing and other computing paradigms based on service-oriented architectures and applications. They make functional and autonomous building blocks available over the Internet, independent of platforms and programming languages, and both within and across organizational boundaries. These can then be described, located, orchestrated, and invoked. Virtualization technology has moreover led to the "software as a service," platform as a service," and "infrastructure as a service" notions.

Formal methods can play a fundamental role in research on these concepts. They can help define unambiguous semantics for the languages and protocols that underpin Web service infrastructures, and provide a basis for checking the conformance and compliance of bundled services. They can also empower dynamic discovery and binding with compatibility checks against behavioral properties, quality of service requirements, and service-level agreements. The resulting possibility of formal verification and analysis of (security) properties and performance (dependability and trustworthiness) is essential to cloud computing and to application areas like e-commerce, e-government, e-health, workflow, business process management, etc. Moreover, the challenges raised by research on these concepts can extend the state of the art in formal methods.

The aim of the WS-FM workshop series is to bring together researchers working on Web services and formal methods in order to catalyze fruitful collaboration. Its scope is not limited to technological aspects. In fact, there is a strong tradition of attracting submissions on formal approaches to enterprise systems modeling in general, and business process modeling in particular. Potentially, this may have a significant and lasting impact on the ongoing standardization efforts in cloud computing technologies. Previous editions of WS-FM took place in Pisa (2004), Versailles (2005), Vienna (2006), Brisbane (2007), Milan (2008), Bologna (2009), Hoboken (2010), and Clermont-Ferrand (2011).

Following the success of the previous workshops, the 9th International Workshop on Web Services and Formal Methods (WS-FM 2012) took place during September 6–7, 2012, in Tallinn, Estonia, co-located with the 10th International Conference on Business Process Management (BPM 2012). The workshop program included keynotes by Farouk Toumani from the Blaise Pascale University Aubière, France, and Emilio Tuosto from the University of Leicester, UK, and papers from researchers across the globe — including Canada, China, Estonia, Germany, Italy, The Netherlands, and Portugal.

This ninth edition of the workshop initially attracted a total of 19 submissions, which were each reviewed by at least three researchers from a strong Program Committee of international reputation. After lively discussions, the committee eventually decided to accept eight papers for a presentation at the workshop and inclusion in the pre-proceedings, but only four papers were

directly accepted for these final proceedings. The remaining four papers underwent a second reviewing phase following their presentation at the workshop, which has eventually led to the acceptance of three of them. This volume contains the revised versions of the resulting seven papers as well as two papers specifically written by our invited speakers based on their excellent keynotes at the workshop.

The contributions in this volume cover aspects such as the modelling and analysis of Web services, service discovery, and service coordination with formal methods like BPEL, CSP, Maude, and Petri nets.

We wish to thank the Program Committee and the external reviewers for their accurate and timely reviewing, in particular those who were also involved in the second reviewing phase. We acknowledge the unbeatable support of Easy-Chair for managing the complete process from submission to these proceedings. Finally, we wish to thank Marlon Dumas for his excellent organization of both BPM and WS-FM.

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