

# Preface

The Web and the Cloud are becoming the drivers of cultural and economical shifts in modern societies. They are indeed transforming many aspects of peoples' life and - complementing traditional methods and procedures- they provide a wide range of new applications and services that span from e-commerce, to e-health, to e-government, etc.

Service-Oriented Computing (SOC) and Cloud Computing are becoming the standard paradigms to investigate and realize state-of-the-art software. Such a paradigm enables the development of services amenable to be configured according to clients' requirements and/or service level guarantee mechanisms. The convergence of SOC and Cloud Computing is accelerating the adoption of technologies from both areas, making service dependability and trustworthiness crucial and pressing problems. The importance of such new technologies and the related computational mechanisms is therefore -more than ever- urging solid theoretical, methodological, and engineering approaches that enable those systems to be properly designed, implemented, verified, and deployed. In this context, formal methods can play a fundamental role and they are receiving increasing attention from industry and academia due to their ability in isolating, formalizing, and analyzing specific problems of modern software systems. As a matter of fact, formal methods can help us to define unambiguous semantics for the languages and protocols that underpin existing service infrastructures, and provide a basis for checking the conformance and compliance of bundled services. They can also enrich dynamic discovery and binding mechanisms by combining them with compatibility checks that guarantee behavioral properties and quality of service requirements. Formal analysis of security properties and performance is essential in the application of SOC and Cloud Computing to areas such as e-science, e-commerce, workflow, business process management, etc.

The traditional aim of the WS-FM workshop series is to catalyze research in the areas of formal methods and SOC. Starting from this year, WS-FM has explicitly extended its scope to Cloud Computing so as to further strengthen its strong tradition in attracting submissions on formal approaches to enterprise systems modeling in general, and business process modeling in particular. Previous workshops took place in Pisa (2004), Versailles (2005), Vienna (2006), Brisbane (2007), Milan (2008), Bologna (2009), Hoboken (2010), Clermont-Ferrand (2011), and Tallin (2012).

This volume contains the papers presented at WS-FM 2013: the 10th International Workshop on Web Services and Formal Methods: Formal Aspects of Service-Oriented and Cloud Computing held during August 28–29, 2014 in Beijing, China. Renewing its recent tradition, WS-FM 2013 was co-located with the 11th International Conference on Business Process Management (BPM 2013). The workshop program included two keynotes by Weicheng Huang from the National Center for High-Performance Computing in Taiwan and Jianwen Su from the University of California at Santa Barbara, USA, and papers from researchers across the globe including Argentina, Austria, China, Denmark, France, Germany, Italy, and UK.

This 10th edition of the workshop initially attracted a total of 19 submissions from researchers in 13 different countries. Each submission was reviewed by at least three members of the Program Committee. Before the workshop, 4 papers were directly accepted for publication in the final proceedings and in addition another 4 interesting submissions were conditionally accepted. All these papers were presented at the workshop. After the workshop, the revised versions of the 4 conditionally accepted papers were submitted and upon a careful review of their revisions, the Program Committee finally decided to also accept these 4 submissions for the final proceedings.

The 8 research papers published in these proceedings cover various topics. Kunze and Weske propose an approach for visualization of control-flow successor relations in business process models using Petri nets. Bocchi and Melgratti introduce a formal semantics of eventual consistency of cloud stores. Yu, Chen, and Wang present an operational semantics for model checking an extended CSP for long running transactions. Michauxl, Najm, and Fantechi investigate safe session-based service interactions, supported by a formalized subset of BPEL, over unreliable and unordered communication channels. Wang and Hildebrandt define a representation of OWL ontologies as bigraphs and bigraphical reaction rules and discuss its potential use for model-driven design and analysis of context-aware systems. Xu, Yin, and Long study higher-order processes with the capability of parameterization for improving the expressiveness of mere process- passing. Margheri, Masi, Pugliese, and Tiezzi define a formal policy language FACPL and develop the software tool to support the design and enforcement of FACPL policies. Bravetti presents a formalization of RESTful services and Web-OS middleware using process algebra. In addition to the above, there are two papers specifically written by our invited speakers based on their interesting keynotes at the workshop.

Finally, we would like to thank the Program Committee and the external reviewers for their thorough and timely reviewing. A special thank goes to Julien Lange and Kyriakos Poyias who set up and maintained the web pages of WS-FM 2013. We also wish to thank the local Organization Committee, led by Jianmin Wang and Lijie Wen, for their excellent organization of both BPM 2013 and WS-FM 2013. We express our gratitude to the developers and maintainers of EasyChair who with their constant efforts made the reviewing process very smooth.

February 2014

Chun Ouyang  
Emilio Tuosto

Web Services and Formal Methods

10th International Workshop, WS-FM 2013, Beijing,

China, August 2013, Revised Selected Papers

Tuosto, E.; Chun, O. (Eds.)

2014, IX, 189 p. 37 illus., Softcover

ISBN: 978-3-319-08259-2