

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Alfred Kobsa

University of California, Irvine, CA, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Germany

Madhu Sudan

Microsoft Research, Cambridge, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbruecken, Germany

Marco Carbone Jean-Marc Petit (Eds.)

Web Services and Formal Methods

8th International Workshop, WS-FM 2011
Clermont-Ferrand, France, September 1-2, 2011
Revised Selected Papers

Volume Editors

Marco Carbone
IT University of Copenhagen
Rued Langgaards Vej 7, 2300 Copenhagen, Denmark
E-mail: carbonem@itu.dk

Jean-Marc Petit
Université de Lyon – CNRS INSA Lyon
LIRIS
7 avenue Jean Capelle, 69621 Villeurbanne Cedex, France
E-mail: jean-marc.petit@insa-lyon.fr

ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-29833-2 e-ISBN 978-3-642-29834-9
DOI 10.1007/978-3-642-29834-9
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012936044

CR Subject Classification (1998): H.4, H.3, D.2, K.6, H.5

LNCS Sublibrary: SL 2 – Programming and Software Engineering

© Springer-Verlag Berlin Heidelberg 2012

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

We are pleased to present the proceedings of the 8th International Workshop on Web Services and Formal Methods (WS-FM 2011), held in Clermont-Ferrand, France during September 1–2, 2011, and co-located with the 9th International Conference on Business Process Management (BPM 2011). The aim of the WS-FM workshop series is to bring together researchers working on service-oriented computing (SOC), cloud computing and formal methods in order to catalyze fruitful collaborations. The scope of the workshop is not limited to technological aspects: In fact, the WS-FM series have a strong tradition of attracting submissions on formal approaches to enterprise systems modeling in general, and business process modeling in particular. Potentially, this could have a significant impact on the on-going standardization efforts for SOC and cloud computing technologies.

SOC provides standard mechanisms and protocols for describing, locating and invoking services over the Internet. Although there are existing SOC infrastructures supporting specification of service interfaces, access policies, behaviors and compositions, there are still many active research areas in SOC such as management of interactions with stateful and long-running services, farms of services and quality of services. Moreover, the emerging paradigm of cloud computing provides a new platform for service delivery, enabling the development of services that are configurable based on client requirements, service level guarantee mechanisms, and extended services based on virtualization. The convergence of SOC and cloud computing is accelerating the adoption of both of these technologies, making the service dependability and trustworthiness a crucial and urgent problem. In this research area, formal methods can play a fundamental role. They can help us define unambiguous semantics for the languages and protocols that underpin existing Web service infrastructures, and they 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 and quality of service requirements. Formal analysis of security properties and performance is also essential in cloud computing and in application areas including e-science, e-commerce, business process management, etc. Moreover, the challenges raised by this new area can offer opportunities for extending the state of the art in formal techniques.

In this edition of the workshop, we received 14 submissions and each of them was reviewed by at least three members of the Program Committee. We decided to accept nine papers. We wish to express our gratitude to all authors of submitted papers, the Program Committee members and the additional reviewers for their efforts in evaluating the papers. We are also very grateful to the two world-class keynote speakers (Kohei Honda, Queen Mary University of London, UK, and Hassan Ait-Kaci, IBM Canada) who gave us two wonderful talks. We also

thank the local Organizing Committee, chaired by Farouk Toumani, for making the practical arrangements for the workshop. Last but not least, we wish to thank Andrei Voronkov, who allowed us to use the free conference software system EasyChair for carrying out the reviewing process of WS-FM 2011.

January 2012

Marco Carbone
Jean-Marc Petit

Organization

Program Committee Co-chairs

Marco Carbone	IT University of Copenhagen, Denmark
Jean-Marc Petit	University of Lyon/CNRS, France

Program Committee

Karthikeyan Bhargavan	INRIA, France
Maria Grazia Buscemi	IMT Lucca, Italy
Marco Carbone	IT University of Copenhagen, Denmark
Florian Daniel	Università di Trento, Italy
Pierre-Malo Daniélou	Imperial College London, UK
Giuseppe De Giacomo	SAPIENZA Università di Roma, Italy
Rocco De Nicola	Università di Firenze, Italy
Marlon Dumas	University of Tartu, Estonia
José Luiz Fiadeiro	University of Leicester, UK
Xiang Fu	Hofstra University, USA
Serge Haddad	ENS Cachan, France
Sylvain Hallé	Université du Québec à Chicoutimi, Canada
Thomas Hildebrandt	IT University of Copenhagen, Denmark
Manuel Mazzara	Newcastle University, UK
Luca Padovani	Università di Torino, Italy
Jean-Marc Petit	University of Lyon/CNRS, France
Steve Ross-Talbot	Pi4Tech, UK
Hagen Voelzer	IBM Research, Switzerland
Nobuko Yoshida	Imperial College London, UK
Fatiha Zaidi	CNRS, France
Gianluigi Zavattaro	Università di Bologna, Italy

Additional Reviewers

M. Bartoletti	R. Hu	P. Poizat
V. Bono	H. Melgratti	F. Tiezzi
S. Dal Zilio	A. Mukhamedov	
L. Fossati	A. Pironti	

Table of Contents

Understanding Distributed Services through the π -Calculus	1
<i>Kohei Honda</i>	
Reliable Contracts for Unreliable Half-Duplex Communications	2
<i>Étienne Lozes and Jules Villard</i>	
Behavior Based Service Composition	17
<i>Fangzhe Chang, Pavithra Prabhakar, and Ramesh Viswanathan</i>	
Compatibility of Data-Centric Web Services	32
<i>Benoît Masson, Loïc H��lou��t, and Albert Benveniste</i>	
Time and Exceptional Behavior in Multiparty Structured Interactions	48
<i>Hugo A. L��pez and Jorge A. P��rez</i>	
Toward Design, Modelling and Analysis of Dynamic Workflow Reconfigurations: A Process Algebra Perspective	64
<i>Manuel Mazzara, Fay��al Abouzaid, Nicola Dragoni, and Anirban Bhattacharyya</i>	
An Operational Semantics of BPEL Orchestrations Integrating Web Services Resource Framework	79
<i>Jos�� Antonio Mateo, Valent��n Valero, and Gregorio D��az</i>	
Design of a BPEL Verification Tool	95
<i>Elie Fares, Jean-Paul Bodeveix, and Mamoun Filali</i>	
Applying Process Analysis to the Italian eGovernment Enterprise Architecture	111
<i>Roberto Bruni, Andrea Corradini, Gianluigi Ferrari, Tito Flagella, Roberto Guanciale, and Giorgio Spagnolo</i>	
Domain-Specific Multi-modeling of Security Concerns in Service-Oriented Architectures	128
<i>Juan Pedro Silva Gallino, Miguel de Miguel, Javier F. Briones, and Alejandro Alonso</i>	
Author Index	143