

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

Wolfgang De Meuter
Gruia-Catalin Roman (Eds.)

Coordination Models and Languages

13th International Conference, COORDINATION 2011
Reykjavik, Iceland, June 6-9, 2011
Proceedings

Volume Editors

Wolfgang De Meuter
Vrije Universiteit Brussel, Faculty of Sciences
Pleinlaan 2, 1050 Brussels, Belgium
E-mail: wdmeuter@vub.ac.be

Gruia-Catalin Roman
Washington University, Department of Computer Science and Engineering
Campus Box 1045, 1 Brookings Drive, St. Louis, MO 63130-4899, USA
E-mail: roman@wustl.edu

ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-21463-9 e-ISBN 978-3-642-21464-6
DOI 10.1007/978-3-642-21464-6
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2011928244

CR Subject Classification (1998): D.2, C.2, C.2.4, F.1.2, I.2.8, I.2.11, C.3

LNCS Sublibrary: SL 2 – Programming and Software Engineering

© IFIP International Federation for Information Processing 2011
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)

Foreword

In 2011 the 6th International Federated Conferences on Distributed Computing Techniques (DisCoTec) took place in Reykjavik, Iceland, during June 6–9. It was hosted and organized by Reykjavik University. The DisCoTec series of federated conferences, one of the major events sponsored by the International Federation for Information processing (IFIP), included three conferences: Coordination, DAIS, and FMOODS/FORTE.

DisCoTec conferences jointly cover the complete spectrum of distributed computing subjects ranging from theoretical foundations to formal specification techniques to practical considerations. The 13th International Conference on Coordination Models and Languages (Coordination) focused on the design and implementation of models that allow compositional construction of large-scale concurrent and distributed systems, including both practical and foundational models, run-time systems, and related verification and analysis techniques. The 11th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS) elicited contributions on architectures, models, technologies and platforms for large-scale and complex distributed applications and services that are related to the latest trends in bridging the physical/virtual worlds based on flexible and versatile service architectures and platforms. The 13th Formal Methods for Open Object-Based Distributed Systems and 31st Formal Techniques for Networked and Distributed Systems (FMOODS/FORTE) together emphasized distributed computing models and formal specification, testing and verification methods.

Each of the three days of the federated event began with a plenary speaker nominated by one of the conferences. On the first day, Giuseppe Castagna (CNRS, Paris 7 University, France) gave a keynote titled “On Global Types and Multi-Party Sessions.” On the second day, Paulo Verissimo (University of Lisbon FCUL, Portugal) gave a keynote talk on “Resisting Intrusions Means More than Byzantine Fault Tolerance.” On the final and third day, Pascal Costanza (ExaScience Lab, Intel, Belgium) presented a talk that discussed “Extreme Coordination—Challenges and Opportunities from Exascale Computing.”

In addition, there was a poster session, and a session of invited talks from representatives of Icelandic industries including Ossur, CCP Games, Marorka, and GreenQloud.

There were five satellite events:

1. The 4th DisCoTec workshop on Context-Aware Adaptation Mechanisms for Pervasive and Ubiquitous Services (CAMPUS)
2. The Second International Workshop on Interactions Between Computer Science and Biology (CS2BIO) with keynote lectures by Jasmin Fisher (Microsoft Research - Cambridge, UK) and Gordon Plotkin (Laboratory for Foundations of Computer Science - University of Edinburgh, UK)

3. The 4th Workshop on Interaction and Concurrency Experience (ICE) with keynote lectures by Prakash Panangaden (McGill University, Canada), Rocco de Nicola (University of Florence, Italy), and Simon Gay (University of Glasgow, UK)
4. The First Workshop on Process Algebra and Coordination (PACO) with keynote lectures by Jos Baeten (Eindhoven University of Technology, The Netherlands), Dave Clarke (Katholieke Universiteit Leuven, Belgium), Rocco De Nicola (University of Florence, Italy), and Gianluigi Zavattaro (University of Bologna, Italy)
5. The 7th International Workshop on Automated Specification and Verification of Web Systems (WWV) with a keynote lecture by Elie Najm (Telecom Paris, France)

I believe that this rich program offered each participant an interesting and stimulating event. I would like to thank the Program Committee Chairs of each conference and workshop for their effort. Moreover, organizing DisCoTec 2011 was only possible thanks to the dedicated work of the Publicity Chair Gwen Salaun (Grenoble INP - INRIA, France), the Workshop Chairs Marcello Bonsangue (University of Leiden, The Netherlands) and Immo Grabe (CWI, The Netherlands), the Poster Chair Martin Steffen (University of Oslo, Norway), the Industry Track Chairs Björn Jónsson (Reykjavik University, Iceland), and Oddur Kjartansson (Reykjavik University, Iceland), and the members of the Organizing Committee from Reykjavik University: Árni Hermann Reynisson, Steinar Hugi Sigurðarson, Georgiana Caltai Goriac, Eugen-Ioan Goriac and Ute Schiffel. To conclude I want to thank the International Federation for Information Processing (IFIP), Reykjavik University, and CCP Games Iceland for their sponsorship.

June 2011

Marjan Sirjani

Preface

The 13th International Conference on Coordination Models and Languages, part of the IFIP federated event on Distributed Computing Techniques, took place in Reykjavik, June 6-9, 2011. The conference focused on the design and implementation of models that allow compositional construction of large-scale concurrent and distributed systems, including both practical and foundational models, runtime systems, and related verification and analysis techniques.

The Program Committee received more than 45 abstracts eventually followed by 35 full paper submissions, covering a varied range of topics including parallel and multicore programming, coordination of mobile systems, (session) types, context management, and programming and reasoning about distributed and concurrent software. Each paper was reviewed anonymously by at least three Program Committee members. After a careful and thorough review process, the Program Committee selected 14 papers for publication, based on their significance, originality, and technical soundness. The review process included a shepherding phase whereby some of the papers received active guidance by one of the Program Committee members in order to produce a high-quality final version.

The program was further enhanced by an inspiring invited talk by Pascal Costanza of the Intel ExaScience Lab. The presentation was entitled “Extreme Coordination—Challenges and Opportunities from Exascale Computing.”

The success of Coordination 2011 was due to the dedication of many people. We thank the authors for submitting high-quality papers, and the Program Committee (and their co-reviewers) for their careful reviews, lengthy discussions, and balanced deliberations during the final selection process. We thank the providers of the EasyChair conference management system, which was used to run the review process and to facilitate the preparation of these proceedings. Finally, we thank the Distributed Computing Techniques Organization Committee (led by Marjan Sirjani) for their enormous contribution in making the logistic aspects of Coordination 2011 a success.

June 2011

Wolfgang De Meuter
Gruia-Catalin Roman

Organization

Program Committee

Farhad Arbab	CWI and Leiden University, The Netherlands
Carlos Canal	University of Málaga, Spain
Dave Clarke	Katholieke Universiteit Leuven, Belgium
Wolfgang De Meuter	Vrije Universiteit Brussel, Belgium
Rocco De Nicola	University of Florence, Italy
Susan Eisenbach	Imperial College, UK
Patrick Eugster	Purdue University, USA
John Field	IBM Research, USA
Robert Hirschfeld	Hasso-Plattner-Institut, Germany
Jean-Marie Jacquet	University of Namur, Belgium
Doug Lea	SUNY Oswego, USA
Jay A. Mccarthy	Brigham Young University, USA
Sun Meng	Peking University, China
Mark Miller	Google, USA
Gruia-Catalin Roman	Washington University in St. Louis, USA
Manuel Serano	INRIA, France
Marjan Sirjani	School of Computer Science, Reykjavik University, Iceland
Carolyn Talcott	SRI International, USA
Vasco Vasconcelos	University of Lisbon, Portugal
Mirko Viroli	Università di Bologna, Italy

Additional Reviewers

Malte Appeltauer	Francisco Martins
Lorenzo Bettini	Ronaldo Menezes
Laura Bocchi	Dimitris Mostrous
Behnaz Changizi	Andrea Omicini
Francisco Couto	Michael Perscheid
Ali Hong	Rosario Pugliese
Mohammad Izadi	Tamara Rezk
Sung-Shik Jongmans	Alessandro Ricci
Narges Khakpour	Manuel Serrano
Ramtin Khosravi	Bastian Steinert
Jens Lincke	Francesco Tiezzi
Michele Loreti	

Table of Contents

Fault in the Future	1
<i>Einar Broch Johnsen, Ivan Lanese, and Gianluigi Zavattaro</i>	
Revisiting Glue Expressiveness in Component-Based Systems	16
<i>Cinzia Di Giusto and Jean-Bernard Stefani</i>	
Encoding Context-Sensitivity in Reo into Non-Context-Sensitive Semantic Models	31
<i>Sung-Shik T.Q. Jongmans, Christian Krause, and Farhad Arbab</i>	
The Context of Coordinating Groups in Dynamic Mobile Networks	49
<i>Christine Julien</i>	
CSP as a Coordination Language	65
<i>Moritz Kleine</i>	
An Efficient Management of Correlation Sets with Broadcast	80
<i>Jacopo Mauro, Maurizio Gabbrielli, Claudio Guidi, and Fabrizio Montesi</i>	
Session Typing for a Featherweight Erlang	95
<i>Dimitris Mostrous and Vasco T. Vasconcelos</i>	
Safe Parallel Programming with Session Java	110
<i>Nicholas Ng, Nobuko Yoshida, Olivier Pernet, Raymond Hu, and Yiannos Kryftis</i>	
Fair Subtyping for Multi-party Session Types	127
<i>Luca Padovani</i>	
Enabling Cross-Technology Mobile Applications with Network-Aware References	142
<i>Kevin Pinte, Dries Harnie, and Theo D'Hondt</i>	
Coordination and Concurrency in Multi-engine Prolog	157
<i>Paul Tarau</i>	
Abstract Machines for Safe Ambients in Wide-Area and Mobile Networks	172
<i>Seiji Umatani, Masahiro Yasugi, and Taiichi Yuasa</i>	

Simulation-Based Performance Analysis of Channel-Based Coordination Models	187
<i>C. Verhoef, C. Krause, O. Kanfers, and R. van der Mei</i>	
Combining Static Analysis and Runtime Checking in Security Aspects for Distributed Tuple Spaces	202
<i>Fan Yang, Tomoyuki Aotani, Hidehiko Masuhara, Flemming Nielson, and Hanne Riis Nielson</i>	
Author Index	219