

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology Madras, Chennai, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbrücken, Germany

More information about this series at <http://www.springer.com/series/7408>


Christel Baier · Luís Caires (Eds.)

Formal Techniques for Distributed Objects, Components, and Systems

38th IFIP WG 6.1 International Conference, FORTE 2018
Held as Part of the 13th International Federated Conference
on Distributed Computing Techniques, DisCoTec 2018
Madrid, Spain, June 18–21, 2018
Proceedings

Editors

Christel Baier
Technische Universität Dresden
Dresden
Germany

Luís Caires 
Departamento de Informática
Universidade Nova de Lisboa
Caparica
Portugal

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-319-92611-7 ISBN 978-3-319-92612-4 (eBook)
<https://doi.org/10.1007/978-3-319-92612-4>

Library of Congress Control Number: 2018944400

LNCS Sublibrary: SL2 – Programming and Software Engineering

© IFIP International Federation for Information Processing 2018, corrected publication 2018

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, 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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG
part of Springer Nature
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword

The 13th International Federated Conference on Distributed Computing Techniques (DisCoTec) took place in Madrid, Spain, during June 18–21, 2018. The DisCoTec series is one of the major events sponsored by the International Federation for Information Processing (IFIP). It comprises three conferences:

- COORDINATION, the IFIP WG6.1 International Conference on Coordination Models and Languages (the conference celebrated its 20th anniversary in 2018)
- DAIS, the IFIP WG6.1 International Conference on Distributed Applications and Interoperable Systems (the conference is in its 18th edition)
- FORTE, the IFIP WG6.1 International Conference on Formal Techniques for Distributed Objects, Components and Systems (the conference is in its 38th edition)

Together, these conferences cover a broad spectrum of distributed computing subjects, ranging from theoretical foundations and formal description techniques to systems research issues. Each day of the federated event began with a plenary speaker nominated by one of the conferences.

In addition to the three main conferences, two satellite events took place during June 20–21, 2018:

- ICE, the Workshop on Interaction and Concurrency Experience (in its 11th edition)
- FADL, Workshop on Foundations and Applications of Distributed Ledgers (this was the first year that the workshop took place)

I would like to thank the Program Committee chairs of the different events for their help and cooperation during the preparation of the conference and the Steering Committee of DisCoTec for its guidance and support. The organization of DisCoTec 2018 was only possible thanks to the dedicated work of the Organizing Committee, including the organization chairs, Jesús Correas and Sonia Estévez (Universidad Complutense de Madrid, Spain), the publicity chair, Ivan Lanese (University of Bologna/Inria, Italy), the workshop chairs, Luis Llana and Ngoc-Thanh Nguyen (Universidad Complutense de Madrid, Spain and Wroclaw University of Science and Technology, Poland, respectively), the finance chair, Mercedes G. Merayo (Universidad Complutense de Madrid, Spain), and the webmaster, Pablo C. Cañizares (Universidad Complutense de Madrid, Spain). Finally, I would like to thank IFIP WG6.1 for sponsoring this event, Springer's *Lecture Notes in Computer Science* team for their support and sponsorship, and EasyChair for providing the reviewing infrastructure.

Preface

This volume contains the papers presented at the 38th IFIP WG 6.1 International Conference on Formal Techniques for Distributed Objects, Components, and Systems (FORTE 2018). It was held as one of the three main conferences of the 13th International Federated Conference on Distributed Computing Techniques (DisCoTec), June 18–21, 2018, in Madrid.

The conference is dedicated to fundamental research on theory, models, tools, and applications for distributed systems. It solicits original contributions that advance the science and technologies for distributed systems, with special interest in the areas of: component- and model-based design; object technology, modularity, software adaptation, service-oriented, ubiquitous, pervasive, grid, cloud, and mobile computing systems; software quality, reliability, availability, and safety; security, privacy, and trust in distributed systems; adaptive distributed systems; self-stabilization; self-healing/organizing; verification, validation, formal analysis, and testing of the above.

The program consisted of ten contributed papers, selected from 28 submissions. Each submission was reviewed by at least three Program Committee members, with the help of external experts. The selection was made based on discussions via the EasyChair conference management system, which was also used to assist with the assembly of the proceedings.

We wish to thank all authors who submitted to FORTE 2018, all the Program Committee members for their excellent work, and the external reviewers for their thorough evaluation of the submissions. We want to say a special thanks to Joachim Klein, who helped us to generate the conference proceedings. In addition, we would like to thank the DisCoTec Organizing Committee for providing an excellent environment for FORTE and other conferences and workshops.

April 2018

Christel Baier
Luís Caires

Organization

Program Committee

Christel Baier	Technische Universität Dresden, Germany
Luis Barbosa	University of Minho, Portugal
Dirk Beyer	Ludwig-Maximilian-Universität München (LMU), Germany
Nikolaj Björner	Microsoft Research, USA
Ahmed Bouajjani	IRIF, University of Paris Diderot, France
Tomas Brazdil	Masaryk University, Czech Republic
Luís Caires	Universidade NOVA de Lisboa, Portugal
Ilaria Castellani	Inria, France
Yuxin Deng	East China Normal University, China
Patrick Eugster	University of Lugano (USI), Switzerland
Arnd Hartmanns	University of Twente, The Netherlands
Thomas Hildebrandt	University of Copenhagen, Denmark
Nils Jansen	Radboud University Nijmegen, The Netherlands
Einar Broch Johnsen	University of Oslo, Norway
Antónia Lopes	Universidade de Lisboa, Portugal
Matteo Mio	CNRS/ENS-Lyon, France
Anna Philippou	University of Cyprus, Cyprus
Jorge A. Pérez	University of Groningen, The Netherlands
Davide Sangiorgi	University of Bologna, Italy
Mahsa Shirmohammadi	CNRS and LIS, France
Alexandra Silva	University College London, UK
Mahesh Viswanathan	University of Illinois at Urbana-Champaign, USA
Heike Wehrheim	Universität Paderborn, Germany
Verena Wolf	Universität des Saarlandes, Germany

Additional Reviewers

Bauer, Matthew	Din, Crystal Chang	Junges, Sebastian
Brunet, Paul	Dokter, Kasper	Kappe, Tobias
Capecchi, Sara	Friedberger, Karlheinz	Koutny, Maciej
Chen, Zhe	Gaspari, Mauro	Kouzapas, Dimitrios
Cheval, Vincent	Heam, Pierre-Cyrille	König, Jürgen
Dezani-Ciancaglini,	Jakobs, Marie-Christine	Lanese, Ivan
Mariangiola	Janssen, Ramon	Long, Huan

Madeira, Alexandre
Mathur, Umang
Peraldi-Frati,
Marie-Agnès
Proenca, Jose

Pun, Ka I
Sammartino, Matteo
Schlatte, Rudolf
Stan, Daniel
Toews, Manuel

van Dijk, Tom
Viering, Malte
Wimmer, Ralf
Worrell, James

Contents

A Distributed Coordination Infrastructure for Attribute-Based Interaction	1
<i>Yehia Abd Alrahman, Rocco De Nicola, Giulio Garbi, and Michele Loreti</i>	
Applied Choreographies	21
<i>Saverio Giallorenzo, Fabrizio Montesi, and Maurizio Gabbrielli</i>	
Monotonic Prefix Consistency in Distributed Systems	41
<i>Alain Girault, Gregor Gössler, Rachid Guerraoui, Jad Hamza, and Dragos-Adrian Seredinschi</i>	
A Modest Security Analysis of Cyber-Physical Systems: A Case Study	58
<i>Ruggero Lanotte, Massimo Merro, and Andrei Munteanu</i>	
Relating Process Languages for Security and Communication Correctness (Extended Abstract).	79
<i>Daniele Nantes and Jorge A. Pérez</i>	
A Calculus for Modeling Floating Authorizations	101
<i>Jovanka Pantović, Ivan Prokić, and Hugo Torres Vieira</i>	
Parameter Synthesis Algorithms for Parametric Interval Markov Chains	121
<i>Laure Petrucci and Jaco van de Pol</i>	
Information Flow Tracking for Side-Effectful Libraries	141
<i>Alexander Sjösten, Daniel Hedin, and Andrei Sabelfeld</i>	
On a Verification Framework for Certifying Distributed Algorithms: Distributed Checking and Consistency	161
<i>Kim Völlinger and Samira Akili</i>	
Preserving Contract Satisfiability Under Non-monotonic Composition	181
<i>Jonas Westman and Mattias Nyberg</i>	
Correction to: Applied Choreographies	E1
<i>Saverio Giallorenzo, Fabrizio Montesi, and Maurizio Gabbrielli</i>	
Author Index	197