Maurice H. ter Beek
Marjan Sirjani (Eds.)

Coordination Models and Languages

24th IFIP WG 6.1 International Conference, COORDINATION 2022
Held as Part of the 17th International Federated Conference
on Distributed Computing Techniques, DisCoTec 2022
Lucca, Italy, June 13–17, 2022, Proceedings

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Springer

Lecture Notes in Computer Science 13271

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Maurice H. ter Beek · Marjan Sirjani (Eds.)

Coordination Models and Languages

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Editors
Maurice H. ter Beek 🔘
ISTI-CNR
Pisa, Italy

Marjan Sirjani 🔘
Mälardalen University
Västerås, Sweden

Foreword

The 17th International Federated Conference on Distributed Computing Techniques (DisCoTec 2022) took place in Lucca from June 13 to June 17, 2022. It was organized by the IMT School for Advanced Studies Lucca. The DisCoTec series is one of the major events sponsored by the International Federation for Information Processing (IFIP), the European Association for Programming Languages and Systems (EAPLS), and the Microservices Community. It comprises three conferences:

– COORDINATION, the IFIP WG 6.1 24th International Conference on Coordination Models and Languages
– DAIS, the IFIP WG 6.1 22nd International Conference on Distributed Applications and Interoperable Systems
– FORTE, the IFIP WG 6.1 42nd International Conference on Formal Techniques for Distributed Objects, Components and Systems

Together, these conferences cover a broad spectrum of distributed computing subjects, ranging from theoretical foundations and formal description techniques to systems research issues. As is customary, the event also included several plenary sessions in addition to the individual sessions of each conference, which gathered attendees from the three conferences. These included joint invited speaker sessions and a joint session for the best papers from the three conferences.

DisCoTec 2022 featured the following invited speakers:

– Muffy Calder, University of Glasgow, UK
– Maarten van Steen, University of Twente, The Netherlands
– Luca Viganò, King's College London, UK

Associated with the federated event, five satellite events took place:

– BlockTEE 2022: Workshop on Blockchain Technologies and Trusted Execution Environments
– CoMinDs 2022: Workshop on Collaborative Mining for Distributed Systems
– FOCODILE 2022: Workshop on the Foundations of Consensus and Distributed Ledgers
– ICE 2022: Workshop on Interaction and Concurrency Experience
– REMV 2022: Workshop on Robotics, Electronics and Machine Vision

Moreover, we also had a number of short tutorials on hot topics:

– An Introduction to Spatial Logics and Spatial Model Checking by Vincenzo Ciancia
– A Gentle Adventure Mechanising Message Passing Concurrency Systems by David Castro-Perez, Francisco Ferreira, Lorenzo Gheri, and Martin Vassor

– Smart Contracts in Bitcoin and BitML by Massimo Bartoletti and Roberto Zunino
– The ΔQ Systems Development Paradigm by Neil Davies, Seyed Hossein Haeri, Peter Thompson, and Peter Van Roy
– ChorChain: a Model-driven Approach for Trusted Execution of Multi-party Business Processes on Blockchain by Alessandro Marcelletti

Of course, all of this could not be done without the precious work of the members of the Program Committees of the three main conferences and of the five workshops, and of the Steering Committee and Advisory Boards. Many thanks to all of them, they are too many to mention. However, I would like to thank personally the Program Committee chairs of the main conferences, namely Maurice ter Beek and Marjan Sirjani (for COORDINATION), David Eyers and Spyros Voulgaris (for DAIS), and Mohammad Mousavi and Anna Philippou (for FORTE). They have managed to select an excellent set of research papers.

The organization of DisCoTec 2022 was only possible thanks to the dedicated work of the Organizing Committee, including Marinella Petrocchi, Simone Soderi, Francesco Tiezzi (Workshops and Tutorials Chair) and Giorgio Audrito (Publicity Chair). But a special thanks has to go to Letterio Galletta, the Chair of the Local Organizing Committee, who, in many cases, because of my absence, acted also as General Chair. Finally, I would like to thank IFIP WG 6.1, EAPLS, and the Microservices Community for sponsoring this event, Springer's Lecture Notes in Computer Science team for their support and sponsorship, EasyChair for providing the reviewing framework, and the IMT School for providing the support and the infrastructure to host the event.

June 2022   Rocco De Nicola

Preface

This volume contains the papers presented at the 24th International Conference on Coordination Models and Languages (COORDINATION 2022) held in beautiful Lucca, Italy, hosted by the IMT School for Advanced Studies Lucca, as part of the 17th International Federated Conference on Distributed Computing Techniques (DisCoTec 2022).

Modern information systems rely increasingly on combining concurrent, distributed, mobile, adaptive, reconfigurable, and heterogeneous components. New models, architectures, languages, and verification techniques are necessary to cope with the complexity induced by the demands of today's software development. Coordination languages have emerged as a successful approach, in that they provide abstractions that cleanly separate behavior from communication, thereby increasing modularity, simplifying reasoning, and ultimately enhancing software development. COORDINATION provides a well-established forum for the growing community of researchers interested in models, languages, architectures, and implementation techniques for coordination.

COORDINATION 2022 solicited high-quality contributions in five different categories: (1) regular long papers describing thorough and complete research results and experience reports; (2) regular short papers describing research in progress or opinion papers on past COORDINATION research, on the current state of the art, or on prospects for the years to come; (3) short tool papers describing technological artefacts in the scope of the research topics of COORDINATION; (4) long tool papers describing technological artefacts in the scope of the research topics of COORDINATION; and (5) survey papers describing important results and success stories that originated in the context of COORDINATION. Furthermore, to enable cross-fertilization with other research communities in computer science or in other engineering or scientific disciplines, COORDINATION sought contributions for a dedicated session on the special topic of microservices organized by Ivan Lanese and Fabrizio Montesi.

The Program Committee (PC), with members from 15 different countries spread over four continents, originally received a total of 32 abstract submissions distributed over all five categories, which eventually resulted in 22 paper submissions: 16 regular long papers, four long tool papers, one regular short paper, and one short tool paper. We were pleased to receive submissions from authors based in 11 different countries in Europe along with the USA. Each submission went through a rigorous review process in which all papers were reviewed by at least three PC members, with the help of some external reviewers. Tool papers were selected according to an account of the tool's functionality and practical capabilities and a short video demonstration. Notably, a lightweight rebuttal was used during the reviewing phase, allowing reviewers to ask for a quick rebuttal in the case of a clearly identifiable issue that seemed decisive for the review outcome and which could likely be quickly clarified by the authors. This phase was followed by a short yet very intense discussion phase. The decision to accept or reject a paper was based not only on the review reports and scores but also, and in particular, on these in-depth discussions. In the end, the PC of COORDINATION 2022 selected 12 papers for presentation during the conference and inclusion in these proceedings: seven

regular long papers, four long tool papers, and one short tool paper. This amounts to an acceptance rate of 55% (independent of whether or not the short papers are included in the calculation).

To credit the effort of tool developers, this edition of COORDINATION introduced for the first time EAPLS artefact badging. The Artefact Evaluation Committee, chaired by the tool track chair Ferruccio Damiani, received six submissions and worked hard to run sometimes complex tools and long experiments. All artefacts achieved the available badge, while five artefacts of particularly good quality were awarded the functional and reusable badge.

The conference featured a keynote by Luca Viganò (King's College London, UK) entitled "Formal Methods for Socio-Technical Security (Formal and Automated Analysis of Security Ceremonies)". We hereby heartily thank our invited speaker.

We are grateful to all involved in COORDINATION 2022. In particular, all PC members and external reviewers for their accurate and timely reviewing, all authors for their submissions, and all attendees for their participation. We also thank all chairs and committees, itemized on the following pages, and the excellent local organization committee chaired by Rocco De Nicola and Letterio Galletta.

We are very grateful to the organizations which sponsored the conference: EAPLS (European Association for Programming Languages and Systems), IFIP (International Federation for Information Processing) WG 6.1, Microservices Community, and Springer.

Finally, we thank Springer for publishing these proceedings in their LNCS and LNPSE book series in cooperation with IFIP, and for facilitating the EAPLS artefact badges on the papers, and we kindly acknowledge the support from EasyChair in assisting us in managing the complete process from submissions through these proceedings to the program.

We hope you enjoyed the conference!

April 2022
Maurice H. ter Beek
Marjan Sirjani

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