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Tiziana Margaria · Bernhard Steffen (Eds.)

Leveraging Applications of Formal Methods, Verification and Validation

Distributed Systems

8th International Symposium, ISoLA 2018
Limassol, Cyprus, November 5–9, 2018
Proceedings, Part III

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Preface

Welcome to ISoLA 2018, the *8th International Symposium on Leveraging Applications of Formal Methods, Verification and Validation*, that was held in Limassol (Cyprus) during November 5–9, 2018, endorsed by EASST, the European Association of Software Science and Technology.

This year's event followed the tradition of its symposia forerunners held 2004 and 2006 in Cyprus, 2008 in Chalkidiki, 2010 and 2012 in Crete, 2014 and 2016 in Corfu, and the series of ISoLA Workshops in Greenbelt (USA) in 2005, Poitiers (France) in 2007, Potsdam (Germany) in 2009, in Vienna (Austria) in 2011, and 2013 in Palo Alto (USA).

As in the previous editions, ISoLA 2018 provided a forum for developers, users, and researchers to discuss issues related to the **adoption and use of rigorous tools and methods** for the specification, analysis, verification, certification, construction, test, and maintenance of systems from the point of view of their different application domains. Thus, since 2004 the ISoLA series of events has served the purpose of bridging the gap between designers and developers of rigorous tools on one hand, and users in engineering and in other disciplines on the other hand. It fosters and exploits synergetic relationships among scientists, engineers, software developers, decision makers, and other critical thinkers in companies and organizations. By providing a specific, dialogue-oriented venue for the discussion of common problems, requirements, algorithms, methodologies, and practices, ISoLA aims in particular at supporting researchers in their quest to improve the usefulness, reliability, flexibility, and efficiency of tools for building systems, and users in their search for adequate solutions to their problems.

The program of the symposium consisted of a collection of *special tracks* devoted to the following hot and emerging topics:

- A Broader View on Verification: From Static to Runtime and Back
  (Organizers: Wolfgang Ahrendt, Marieke Huisman, Giles Reger, Kristin Yvonne Rozier)
- Evaluating Tools for Software Verification
  (Organizers: Markus Schordan, Dirk Beyer, Stephen F. Siegel)
- Towards a Unified View of Modeling and Programming
  (Organizers: Manfred Broy, Klaus Havelund, Rahul Kumar, Bernhard Steffen)
- RV-TheToP: Runtime Verification from Theory to Industry Practice
  (Organizers: Ezio Bartocci and Ylies Falcone)
- Rigorous Engineering of Collective Adaptive Systems
  (Organizers: Rocco De Nicola, Stefan Jähnichen, Martin Wirsing)
- Reliable Smart Contracts: State of the Art, Applications, Challenges, and Future Directions
  (Organizers: Gerardo Schneider, Martin Leucker, César Sánchez)

- Formal Methods in Industrial Practice—Bridging the Gap
  (Organizers: Michael Felderer, Dilian Gurov, Marieke Huisman, Björn Lisper, Rupert Schlick)
- X-by-Construction
  (Organizers: Maurice H. ter Beek, Loek Cleophas, Ina Schaefer, and Bruce W. Watson)
- Statistical Model Checking
  (Organizers: Axel Legay and Kim Larsen)
- Verification and Validation of Distributed Systems
  (Organizer: Cristina Seceleanu)
- Cyber-Physical Systems Engineering
  (Organizers: J Paul Gibson, Marc Pantel, Peter Gorm Larsen, Jim Woodcock, John Fitzgerald)

The following events were also held:

- RERS: Challenge on Rigorous Examination of Reactive Systems (Bernhard Steffen)
- Doctoral Symposium and Poster Session (Anna-Lena Lamprecht)
- Industrial Day (Axel Hessenkämper, Falk Howar, Andreas Rausch)

Co-located with the ISoLA Symposium were:

- RV 2018: 18th International Conference on Runtime Verification (Saddek Bensalem, Christian Colombo, and Martin Leucker)
- STRESS 2018: 5th International School on Tool-based Rigorous Engineering of Software Systems (John Hatcliff, Tiziana Margaria, Robby, Bernhard Steffen)

Owing to the growth of ISoLA 2018, the proceedings of this edition are published in four volumes of LNCS: Part 1: Modeling, Part 2: Verification, Part 3: Distributed Systems, and Part 4: Industrial Practice. In addition to the contributions of the main conference, the proceedings also include contributions of the four embedded events and tutorial papers for STRESS.

We thank the track organizers, the members of the Program Committee and their referees for their effort in selecting the papers to be presented, the local Organization Chair, Petros Stratis, the EasyConferences team for their continuous precious support during the week as well as during the entire two-year period preceding the events, and Springer for being, as usual, a very reliable partner in the proceedings production. Finally, we are grateful to Kyriakos Georgiades for his continuous support for the website and the program, and to Markus Frohme and Julia Rehder for their help with the online conference service (EquinOCS).

Special thanks are due to the following organization for their endorsement: EASST (European Association of Software Science and Technology) and Lero – The Irish Software Research Centre, and our own institutions: TU Dortmund and the University of Limerick.

November 2018

Tiziana Margaria
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