

Preface

This volume contains the papers presented at SEFM 2017, the 15th International Conference on Software Engineering and Formal Methods, held on September 4–8 in Trento, Italy. SEFM 2017 was organized and hosted by the Fondazione Bruno Kessler (FBK), Trento, Italy.

The SEFM conference aims to bring together leading researchers and practitioners from academia, industry and government, to advance the state of the art in formal methods, to facilitate their uptake in the software industry, and to encourage their integration within practical software engineering methods and tools. The topics of interest for submission included the following aspects of software engineering and formal methods:

- New frontiers in software architecture: self-adaptive, service-oriented, and cloud computing systems; component-based, object-based, and multi-agent systems; real-time, hybrid, and embedded systems; reconfigurable systems
- Software verification and testing: model checking and theorem proving; verification and validation; probabilistic verification and synthesis; testing
- Software development methods: requirement analysis, modeling, specification, and design; light-weight and scalable formal methods
- Application and technology transfer: case studies, best practices, and experience reports; tool integration
- Security and safety: security and mobility; safety-critical, fault-tolerant, and secure systems; software certification
- Design principles: domain-specific languages, type theory, abstraction, and refinement

SEFM 2017 hosted six workshops:

- FAACS – Formal Approaches for Advanced Computing Systems
- MSE – Microservices: Science and Engineering
- POTENTIAL – Technology Transfer in Software Engineering and Formal Methods
- DataMod – From Data to Models and Back
- CoSim-CPS – Formal Co-Simulation of Cyber-Physical Systems
- FOCLASA – Foundations of Coordination Languages and Self-Adaptive Systems

SEFM 2017 solicited full research papers describing original research results, case studies and tools, and short papers on new ideas and work-in-progress, describing new approaches, techniques and/or tools that are not fully validated yet. We received 102 submissions (88 full and 14 short) from 36 different countries. Each submission was reviewed by at least four Program Committee members. We accepted 22 regular papers, with an acceptance rate of 25%. We also accepted 6 short papers on new ideas and work-in-progress. The program also included three remarkable invited talks:

- Marsha Chechik, from the University of Toronto, Canada, presented “Software Safety and Security, Assurance Cases and Model Management”.
- Jeff Kramer, from Imperial College London, UK, presented “The Challenge of Change”.
- Alberto Sangiovanni-Vincentelli, from the University of California, Berkeley, USA, presented “A Formal Contract-Based Design Methodology for Cyber-Physical Systems”.

Our first words of thanks go to the Program Committee members and to the external reviewers, who carried out thorough and careful reviews and enabled the assembly of this high-quality work. We thank the authors for their submissions, and for their collaboration in further improving their papers. A special word of thanks goes to our invited speakers, Marsha Chechick, Jeff Kramer and Alberto Sangiovanni-Vincentelli, for accepting our invitation and for their very stimulating contributions. We also thank the workshop chairs, Antonio Cerone and Marco Roveri, and the organizers of the workshops: Paolo Arcaini, Marina Mongiello, Elvinia Riccobene and Patrizia Scandurra (FAACS); Marcello M. Bersani, Antonio Bucchiarone, Luca Ferrucci, Manuel Mazzara, Fabrizio Montesi and Nicola Dragoni (MSE); Roberto Confalonieri and Andrea Janes (POTENTIAL); Paolo Milazzo, Vashti Galpin and Andre Teixeira (DataMod); Cinzia Bernardeschi, Paolo Masci and Peter Gorm Larsen (CoSim-CPS); Carlos Canal and Gwen Salaün (FOCLASA). Many thanks to Alberto Griggio (publicity chair) and Gianni Zampedri (web master). A special word of thanks goes to Annalisa Armani and to all the other members of the Ufficio Eventi of FBK, who largely contributed to the success of this event. We also thank the developers and maintainers of the EasyChair conference management system, which was of great help in handling paper submission, reviewing, discussion, and the assembly of the proceedings. Finally, we are most grateful to Hossein Hojjat, who provided invaluable help in the preparation of the conference proceedings.

July 2017

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Software Engineering and Formal Methods
15th International Conference, SEFM 2017, Trento,
Italy, September 4–8, 2017, Proceedings
Cimatti, A.; Sirjani, M. (Eds.)
2017, XIX, 410 p. 94 illus., Softcover
ISBN: 978-3-319-66196-4