

# Preface

Applying formal methods may involve the usage of different formalisms and different analysis techniques to validate a system, either because individual components are most amenable to one formalism or technique, because one is interested in different properties of the system, or simply to cope with the sheer complexity of the system. The iFM conference series seeks to further research into hybrid approaches to formal modeling and analysis; i.e., the combination of (formal and semi-formal) methods for system development, regarding both modeling and analysis. The conference covers all aspects from language design through verification and analysis techniques to tools and their integration into software engineering practice.

These proceedings document the outcome of the 13th International Conference on Integrated Formal Methods, iFM 2017, on recent developments toward this goal. The conference was held in Turin, Italy, on September 20–22, 2017, hosted by the University of Turin. Previous editions of iFM were held in York, UK (1999), Schloss Dagstuhl, Germany (2000), Turku, Finland (2002), Kent, UK (2004), Eindhoven, The Netherlands (2005), Oxford, UK (2007), Düsseldorf, Germany (2009), Nancy, France (2010), Pisa, Italy (2012), Turku, Finland (2013), Bertinoro, Italy (2014), and Reykjavik, Iceland (2016).

The conference received 61 submissions from authors in 24 countries. Papers were submitted in four categories: research papers, case study papers, regular tool papers, and tool demonstration papers. All papers were reviewed by at least three members of the Program Committee. After careful deliberation, the Program Committee selected 28 papers for presentation.

Among these papers, the Program Chairs, in consultation with the Program Committee, have selected winners for two awards. The contribution “Triggerless Happy: Intermediate Verification with a First-Order Prover” by YuTing Chen and Carlo A. Furia received the *Best Paper Award*. The contribution “Complexity Analysis for Java with AProVE” by Florian Frohn and Jürgen Giesl received the *Best Tool Paper Award*. Each award was accompanied by a EUR 500 prize, generously provided by Springer.

In addition to the 28 peer-reviewed papers, this volume contains contributions from each of the three invited keynote speakers:

- Jane Hillston (University of Edinburgh, UK): “Integrating Inference with Stochastic Process Algebra Models”
- André Platzer (Carnegie Mellon University, USA): “Logic & Proofs for Cyber-Physical Systems with KeYmaera X”
- Martin Vechev (ETH Zurich, Switzerland): “Machine Learning for Programming”

Invited presentations are always the highlights of a conference; these contributions are therefore gratefully acknowledged.

iFM was accompanied by a PhD Symposium, organized by the symposium chairs, Erika Ábrahám (RWTH Aachen University, Germany) and S. Lizeth Tapia Tarifa

(University of Oslo, Norway), as well as the following satellite events, managed by the workshop chairs, Wolfgang Ahrendt (Chalmers University of Technology, Sweden) and Michael Lienhardt (University of Turin, Italy):

- International Workshop on Formal Methods for Industrial Critical Systems and Automated Verification of Critical Systems (FMICS-AVoCS)
- Workshop on Architectures, Languages and Paradigms for IoT (ALP4IoT)
- Workshop on Actors and Active Objects (WAO)
- Workshop on Formal Verification of Autonomous Vehicles (FVAV)
- Second International Workshop on Pre- and Post-Deployment Verification Techniques (PrePost)
- Second International Workshop on Verification and Validation of Cyber-Physical Systems (V2CPS)

The conference would not have been possible without the enthusiasm and dedication of the iFM general chair, Ferruccio Damiani, and the support of the Computer Science Department at the University of Turin, Italy. The EasyChair conference management system was invaluable for conducting the peer review process and preparing the proceedings. Conferences like iFM rely on the willingness of experts to serve on the Program Committee; their professionalism and their helpfulness was exemplary. Finally, we would like to thank all the authors for their submissions, their willingness to continue improving their papers, and their presentations!

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