

Preface

The first workshop on “Application of Formal Methods for Safety and Security Critical Systems (AFMSS-2016)” was organized by CSIR-National Aerospace Laboratories, Bangalore, India, on May 25–27, 2016. This workshop presented a platform for the discussion and representation of research and developments in the field of formal methods, and its applications for ensuring safety and security of safety-critical systems. A decent number of research papers from prospective authors were submitted for this workshop. The editors have selected 12 papers after the double-blind peer-review process by experienced subject expert reviewers chosen from various industrial and research domains, in India and abroad. The proceeding of AFMSS-2016 is a mix of papers from some latest findings and research and ongoing project activities of the authors.

The workshop aimed at bringing together formal methods practitioners, engineers, technologists, and academia. The aim is to create a forum for further discussions, an integrated information dissemination outlet in all aspects of formal methods and its applications. The call for paper addressed the following broad topics.

- Design, specification, code generation, and testing based on formal methods.
- Methods, techniques, and tools to support automated analysis, certification, debugging, learning, optimization and transformation of complex, distributed real-time systems and embedded systems.
- Verification and validation methods that address shortcomings of existing methods with respect to their industrial applicability (e.g., scalability and usability issues).
- Tools for the development of formal design descriptions.
- Case studies and experience reports on industrial applications of formal methods, focusing on lessons learned or identification of new research directions.
- Impact of the adoption of formal methods on the development process and associated costs and time.

- Standardization of formal methods application in industrial forums.
- Formal method-based tools analysis certification aspects toward safety-critical applications.

All the papers are focused on the thematic presentation areas of the workshop and they have provided ample opportunity for presentation in the sessions. Research in the application of formal methods has its own history and importance. This volume presents an exciting collection of contributions resulting from a successful call for papers. The selected papers including both review and research papers highlight the current focus of applications of formal methods on safety and security of safety-critical systems. There is no doubt that the tips, lessons learnt, and further advancements in formal methods and its applications in the safety and security of safety-critical systems presented in this volume will be of use to researchers and professionals alike.

It is been a great honor for us to edit the proceedings. We have considerably enjoyed working in cooperation with the international advisory, and program and technical committees to call for papers, review papers, and finalize papers for presentation and inclusion in these proceedings. The AFMSS conference and proceedings are a credit to a large group of people and everyone should be proud of the outcome. First and foremost are the authors of the papers, columns, and editorials whose works have made the workshop a great success. We had a great time putting together this proceeding. We extend our deep sense of gratitude to all for their warm encouragement, inspiration, and continuous support for making it possible.

We hope the readers will appreciate the good contributions made and justify our efforts.

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