

Preface

This volume presents a set of papers accompanying the lectures of the 13th International School on Formal Methods for the Design of Computer, Communication and Software Systems (SFM). This series of schools addresses the use of formal methods in computer science as a prominent approach to the rigorous design of the above-mentioned systems. The main aim of the SFM series is to offer a good spectrum of current research in foundations as well as applications of formal methods, which can be of help for graduate students and young researchers who intend to approach the field. SFM 2013 was devoted to dynamical systems and covered several topics including chaotic dynamics, information theory, systems biology, hybrid systems, quantum computing, and automata-based models and model checking.

The five papers collected in this volume represent the broad range of topics of the school. The paper by Köpf and Rybalchenko addresses the automation of the analysis of quantitative information-theoretic confidentiality properties through approximation and randomization techniques. Gratie, Iancu, and Petre introduce some of the basics of modeling with ODEs in biology by focussing on computational, numerical techniques for reaction-based models. The paper by Brim, Češka, and Šafránek presents a selection of approaches used for modeling biological systems and formalizing their interesting properties in temporal logics, together with high-performance model-checking techniques. Bortolussi and Hillston describe recent work on the use of fluid approximation techniques in the context of stochastic model checking for population models in which a large number of individual agents interact. Finally, Pachos' paper is an introduction to topological quantum computation.

We believe that this book offers a useful view of what has been done and what is going on worldwide in the field of formal methods for dynamical systems. We wish to thank all the speakers and all the participants for a lively and fruitful school. We also wish to thank the entire staff of the University Residential Center of Bertinoro for the organizational and administrative support.

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