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Fundamental Approaches to Software Engineering

14th International Conference, FASE 2011
Held as Part of the Joint European Conferences
on Theory and Practice of Software, ETAPS 2011
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Proceedings

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Foreword

ETAPS 2011 was the 14th instance of the European Joint Conferences on Theory and Practice of Software. ETAPS is an annual federated conference that was established in 1998 by combining a number of existing and new conferences. This year it comprised the usual five sister conferences (CC, ESOP, FASE, FOS-SACS, TACAS), 16 satellite workshops (ACCAT, BYTECODE, COCV, DICE, FESCA, GaLoP, GT-VMT, HAS, IWIGP, LDTA, PLACES, QAPL, ROCKS, SVARM, TERMGRAPH, and WGT), one associated event (TOSCA), and seven invited lectures (excluding those specific to the satellite events).

The five main conferences received 463 submissions this year (including 26 tool demonstration papers), 130 of which were accepted (2 tool demos), giving an overall acceptance rate of 28%. Congratulations therefore to all the authors who made it to the final programme! I hope that most of the other authors will still have found a way of participating in this exciting event, and that you will all continue submitting to ETAPS and contributing to make of it the best conference on software science and engineering.

The events that comprise ETAPS address various aspects of the system development process, including specification, design, implementation, analysis and improvement. The languages, methodologies and tools which support these activities are all well within its scope. Different blends of theory and practice are represented, with an inclination towards theory with a practical motivation on the one hand and soundly based practice on the other. Many of the issues involved in software design apply to systems in general, including hardware systems, and the emphasis on software is not intended to be exclusive.

ETAPS is a confederation in which each event retains its own identity, with a separate Programme Committee and proceedings. Its format is open-ended, allowing it to grow and evolve as time goes by. Contributed talks and system demonstrations are in synchronised parallel sessions, with invited lectures in plenary sessions. Two of the invited lectures are reserved for ‘unifying’ talks on topics of interest to the whole range of ETAPS attendees. The aim of cramming all this activity into a single one-week meeting is to create a strong magnet for academic and industrial researchers working on topics within its scope, giving them the opportunity to learn about research in related areas, and thereby to foster new and existing links between work in areas that were formerly addressed in separate meetings.

ETAPS 2011 was organised by the *Universität des Saarlandes* in cooperation with:

- ▷ European Association for Theoretical Computer Science (EATCS)
- ▷ European Association for Programming Languages and Systems (EAPLS)
- ▷ European Association of Software Science and Technology (EASST)

It also had support from the following sponsors, which we gratefully thank: DFG DEUTSCHE FORSCHUNGSGEMEINSCHAFT; ABSINT ANGEWANDTE INFORMATIK GMBH; MICROSOFT RESEARCH; ROBERT BOSCH GMBH; IDS SCHEER AG / SOFTWARE AG; T-SYSTEMS ENTERPRISE SERVICES GMBH; IBM RESEARCH; GWSAAR GESELLSCHAFT FÜR WIRTSCHAFTSFÖRDERUNG SAAR MBH; SPRINGER-VERLAG GMBH; and ELSEVIER B.V.

The organising team comprised:

General Chair:	<i>Reinhard Wilhelm</i>
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Satellite Events:	<i>Bernd Finkbeiner</i>
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Overall planning for ETAPS conferences is the responsibility of its Steering Committee, whose current membership is:

Vladimiro Sassone (Southampton, Chair), Parosh Abdulla (Uppsala), Gilles Barthe (IMDEA-Software), Lars Birkedal (Copenhagen), Michael O’Boyle (Edinburgh), Giuseppe Castagna (CNRS Paris), Marsha Chechik (Toronto), Sophia Drossopoulou (Imperial College London), Bernd Finkbeiner (Saarbrücken) Cormac Flanagan (Santa Cruz), Dimitra Giannakopoulou (CMU/NASA Ames), Andrew D. Gordon (MSR Cambridge), Rajiv Gupta (UC Riverside), Chris Hankin (Imperial College London), Holger Hermanns (Saarbrücken), Mike Hinchey (Lero, the Irish Software Engineering Research Centre), Martin Hofmann (LMU Munich), Joost-Pieter Katoen (Aachen), Paul Klint (Amsterdam), Jens Knoop (Vienna), Barbara König (Duisburg), Shriram Krishnamurthi (Brown), Juan de Lara (Madrid), Kim Larsen (Aalborg), Rustan Leino (MSR Redmond), Gerald Luetzgen (Bamberg), Rupak Majumdar (Los Angeles), Tiziana Margaria (Potsdam), Ugo Montanari (Pisa), Luke Ong (Oxford), Fernando Orejas (Barcelona), Catuscia Palamidessi (INRIA Paris), George Papadopoulos (Cyprus), David Rosenblum (UCL), Don Sannella (Edinburgh), João Saraiva (Minho), Helmut Seidl (TU Munich), Tarmo Uustalu (Tallinn), and Andrea Zisman (London).

I would like to express my sincere gratitude to all of these people and organisations, the Programme Committee Chairs and members of the ETAPS conferences, the organisers of the satellite events, the speakers themselves, the many reviewers, all the participants, and Springer for agreeing to publish the ETAPS proceedings in the ARCoSS subline.

Finally, I would like to thank the Organising Chair of ETAPS 2011, Holger Hermanns and his Organising Committee, for arranging for us to have ETAPS in the most beautiful surroundings of Saarbrücken.

Preface

FASE (Fundamental Approaches to Software Engineering) is concerned with the foundations on which software engineering is built. Its focus is on novel techniques and the way in which they contribute to making software engineering a more mature and soundly based discipline. This year, we particularly encouraged contributions that combine the development of conceptual and methodological advances with their formal foundations and tool support. We welcomed contributions on all such fundamental approaches, including:

- Software engineering as an engineering discipline, including its interaction with and impact on society
- Requirements engineering: capture, consistency, and change management of software requirements
- Software architectures: description and analysis of the architecture of individual systems or classes of applications
- Specification, design, and implementation of particular classes of systems: adaptive, collaborative, embedded, distributed, mobile, pervasive, or service-oriented applications
- Software quality: validation and verification of software using theorem proving, model-checking, testing, analysis, refinement methods, metrics or visualization techniques
- Model-driven development and model-transformation: design and semantics of semi-formal visual languages, consistency and transformation of models
- Software processes: support for iterative, agile, and open source development
- Software evolution: re-factoring, reverse and re-engineering, configuration management and architectural change, or aspect-orientation

We solicited two types of contributions: research papers and tool demonstration papers. We received submissions from 31 countries around the world: 116 abstracts followed by 99 full papers, of which 2 were tool papers. The selection process was rigorous. Each paper received at least three reviews. We obtained external reviews for papers that lacked expertise within the Program Committee. We also had four reviews for all papers that did not receive high bids and for papers that had Program Committee authors so as to ensure high quality in accepted papers. Moreover, the Program Committee had extensive online discussions in order to decide on the papers to be accepted for the conference.

The Program Committee accepted 29 research papers, corresponding to a 29% acceptance rate among the full submissions. We believe that the accepted papers made a scientifically strong and exciting program, which triggered interesting discussions and exchange of ideas among the ETAPS participants. The accepted papers cover several aspects of software engineering, including modeling, specification, verification, testing, quality of service, code development, and model-based development.

Finally, FASE 2011 was honored to host an invited talk by Marta Kwiatkowska, titled “Automated Learning of Probabilistic Assumptions for Compositional Reasoning.” We feel that this talk will inspire the software engineering community towards two key trends in formal reasoning of realistic systems. Probabilistic reasoning is often the only meaningful approach in the presence of uncertainty, and compositionality is essential for scalability.

We would like to thank all authors who submitted their work to FASE. Without their excellent contributions we would not have managed to prepare a strong program. We also thank the Program Committee members and external reviewers for their high-quality reviews and their effort and time in making the selection process run smoothly and on time. Finally, we wish to express our gratitude to the Organizing and Steering Committees for their excellent support.

The logistics of our job as Program Chairs were facilitated by the EasyChair system.

January 2011

Dimitra Giannakopoulou
Fernando Orejas

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