

# Foreword

ETAPS 2004 was the seventh 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 five conferences (FOSSACS, FASE, ESOP, CC, TACAS), 23 satellite workshops, 1 tutorial, and 7 invited lectures (not including those that are specific to the satellite events).

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 that 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 loose confederation in which each event retains its own identity, with a separate program committee and independent proceedings. Its format is open-ended, allowing it to grow and evolve as time goes by. Contributed talks and system demonstrations are in synchronized 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 2004 was organized by the LSI Department of the Catalonia Technical University (UPC), 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)
- ACM SIGACT, SIGSOFT and SIGPLAN

The organizing team comprised

- Jordi Cortadella (Satellite Events), Nikos Mylonakis, Robert Nieuwenhuis,
- Fernando Orejas (Chair), Edelmira Pasarella, Sonia Perez, Elvira Pino,
- Albert Rubio

and had the assistance of TILES A OPC.

ETAPS 2004 received generous sponsorship from:

- UPC, Spanish Ministry of Science and Technology (MCYT), Catalan
- Department for Universities, Research and Information Society (DURSI),
- IBM, Intel.

Overall planning for ETAPS conferences is the responsibility of its Steering Committee, whose current membership is:

Ratislav Bodik (Berkeley), Maura Cerioli (Genoa), Evelyn Duesterwald (IBM, Yorktown Heights), Hartmut Ehrig (Berlin), José Fiadeiro (Leicester), Marie-Claude Gaudel (Paris), Andy Gordon (Microsoft Research, Cambridge), Roberto Gorrieri (Bologna), Nicolas Halbwachs (Grenoble), Görel Hedin (Lund), Kurt Jensen (Aarhus), Paul Klint (Amsterdam), Tiziana Margaria (Dortmund), Ugo Montanari (Pisa), Hanne Riis Nielson (Copenhagen), Fernando Orejas (Barcelona), Mauro Pezzè (Milan), Andreas Podelski (Saarbrücken), Mooly Sagiv (Tel Aviv), Don Sannella (Edinburgh), Vladimiro Sassone (Sussex), David Schmidt (Kansas), Bernhard Steffen (Dortmund), Perdita Stevens (Edinburgh), Andrzej Tarlecki (Warsaw), Igor Walukiewicz (Bordeaux), Michel Wermelinger (Lisbon)

I would like to express my sincere gratitude to all of these people and organizations, the program committee chairs and PC members of the ETAPS conferences, the organizers of the satellite events, the speakers themselves, and finally Springer-Verlag for agreeing to publish the ETAPS proceedings. This year, the number of submissions approached 600, making acceptance rates fall to 25%. Congratulations to all the authors who made it into the final program! I hope that all the other authors still found a way of participating in this exciting event and I hope you will continue submitting.

In 2005, ETAPS will be organized by Don Sannella in Edinburgh. You will be welcomed by another “local”: my successor as ETAPS Steering Committee Chair – Perdita Stevens. My wish is that she will enjoy coordinating the next three editions of ETAPS as much as I have. It is not an easy job, in spite of what Don assured me when I succeeded him! But it is definitely a very rewarding one. One cannot help but feel proud of seeing submission and participation records being broken one year after the other, and that the technical program reached the levels of quality that we have been witnessing. At the same time, interacting with the organizers has been a particularly rich experience. Having organized the very first edition of ETAPS in Lisbon in 1998, I knew what they were going through, and I can tell you that each of them put his/her heart, soul, and an incredible amount of effort into the organization. The result, as we all know, was brilliant on all counts! Therefore, my last words are to thank Susanne Graf (2002), Andrzej Tarlecki and Paweł Urzyczyn (2003), and Fernando Orejas (2004) for the privilege of having worked with them.

Leicester, January 2004

José Luiz Fiadeiro  
ETAPS Steering Committee Chair

# Preface

This volume contains the proceedings of the seventh FASE, International Conference on Fundamental Approaches to Software Engineering.

FASE 2004 took place in Barcelona, Spain, during March 29–31, 2004, as part of the 7th European Joint Conference on Theory and Practice of Software (ETAPS), whose aims, organization, and history are detailed in the separate foreword by José Luiz Fiadeiro.

It is the goal of FASE to bring together researchers and practitioners interested in the challenges in software engineering research and practice: new software structuring and scaling concepts are needed for heterogeneous software federations that consist of numerous autonomously developed, communicating and interoperating systems. In particular, FASE aims at creating an atmosphere that promotes a cross-fertilization of ideas between the different communities of software engineering and related disciplines. New quality assurance methods are needed to guarantee acceptable standards of increasingly complex software applications. Different component paradigms are under discussion now, a large number of specification and modeling language are proposed, and an increasing number of software development tools and environments are being made available to cope with the problems. At the same time research on new theories, concepts, and techniques is under way, which aims at the development of a precise and (mathematically) formal foundation.

The presented contributions involved both pragmatic concepts and their formal foundation, leading to new engineering practices and a higher level of reliability, robustness, and evolvability of heterogeneous software. FASE comprised:

- **invited lectures** by Serge Abiteboul on *Distributed Information Management with XML and Web Services* and by Gruia-Catalin Roman on *A Formal Treatment of Context-Awareness*;
- **regular sessions** featuring 22 papers selected out of a record number of 91 submissions that ranged from foundational contributions to presentation of fielded applications; and
- **tool demonstrations**, featuring 4 short contributions selected out of 7 high-quality tool submissions.

FASE 2004 was hosted by the Technical University of Catalonia (UPC), and, being part of ETAPS, it shared the sponsoring and support described by the ETAPS Chair in the Foreword. Like ETAPS, FASE will take place in Edinburgh next year.

Warm thanks are due to the program committee and to all the referees for their assistance in selecting the papers, to José Luiz Fiadeiro for mastering the coordination of the whole ETAPS, and to Fernando Orejas and the whole team in Barcelona for their brilliant organization.

Recognition is due to the technical support team: Martin Karusseit and Markus Bajohr at the University of Dortmund provided invaluable assistance to all the involved people concerning the Online Conference Service provided by METAFrame Technologies during the past three months. Finally, we are deeply indebted to Claudia Herbers for her first-class support in the preparation of this volume.

January 2004

Tiziana Margaria and Michel Wermelinger

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