

Preface

Formal methods are coming of age. Mathematical techniques and tools are now regarded as an important part of the development process in a wide range of industrial and governmental organisations. A transfer of technology into the mainstream of systems development is slowly, but surely, taking place.

FM'99, the First World Congress on Formal Methods in the Development of Computing Systems, is a result, and a measure, of this new-found maturity. It brings an impressive array of industrial and applications-oriented papers that show how formal methods have been used to tackle real problems.

These proceedings are a record of the technical symposium of *FM'99*: alongside the papers describing applications of formal methods, you will find technical reports, papers, and abstracts detailing new advances in formal techniques, from mathematical foundations to practical tools.

The World Congress is the successor to the four Formal Methods Europe Symposia, which in turn succeeded the four VDM Europe Symposia. This succession reflects an increasing openness within the international community of researchers and practitioners: papers were submitted covering a wide variety of formal methods and application areas.

The programme committee reflects the Congress's international nature, with a membership of 84 leading researchers from 38 different countries. The committee was divided into 19 tracks, each with its own chair to oversee the reviewing process. Our collective task was a difficult one: there were 259 high-quality submissions from 35 different countries.

Each paper was reviewed within a track, the track chairs resolved conflicts between reviewers, and the recommendations of each track chair were considered by the executive programme committee. This resulted in 92 papers being accepted, along with 15 abstracts describing work in progress and industrial applications.

We thank all those members of the programme and organising committees for their hard work, carried out under necessarily short deadlines. Thanks are due also to our able administrators, Maureen York and Anna Curtis; they did an excellent job and they deserve our gratitude for their contribution.

Finally, thanks to all those who submitted papers and attended the Congress: it is your hard work that has made it such a timely and important event.

July 1999

Jeannette Wing
Jim Woodcock
Jim Davies

Technical Tracks

The tracks that structure the technical symposium may be divided into three groups. First, there are application areas:

- Avionics
- Co-design
- Open information systems
- Safety
- Security
- Telecommunications

Second, there are processes and techniques:

- Composition and synthesis
- Integration
- Model checking
- Software architecture
- Object orientation
- Program verification
- Refinement
- Testing

Finally, there are groups of users and researchers:

- European Association for Theoretical Computer Science
- Foundations of System Specification
- Formal Description of Programming Concepts
- Abstract State Machines
- European Theory and Practice of Software
- Algebraic Methods in Software Technology
- OBJ / CafeOBJ / Maude
- The B method

Our five distinguished invited speakers are Tony Hoare of the University of Oxford, Cliff Jones of the University of Manchester, Amir Pnueli of the Weizmann Institute, Joseph Sifakis of Verimag, John Rushby of SRI International, and Michael Jackson, independent consultant.

Symposium Committee

Keijiro Araki, Japan
Egidio Astesiano, Italy
Albert Benveniste, France
Didier Bert, France
Dines Bjørner, Denmark
Robin Bloomfield, UK
Dominique Bolignano, France
Egon Börger, Italy
Jonathan Bowen, UK
Wilfried Brauer, Germany
Ed Brinksma, NL
Manfred Broy, Germany
Andrew Butterfield, Ireland
Jacques Cazin, France
Edmund Clarke, USA
Dan Craigen, Canada
Jorge Cuéllar, Germany
Aristides Dasso, Argentina
Jim Davies, UK
Tim Denvir, UK
Jin Song Dong, Singapore
Steve Dunne, UK
Hartmut Ehrig, Germany
John Fitzgerald, UK
Laure Pauline Fotso, Cameroon
Birgitte Fröhlich, Austria
Kokichi Futatsugi, Japan
David Garlan, USA
Marie-Claude Gaudel, France
Chris George, Macau
David Gries, USA
Henri Habrias, France
Armando Haeberer, Brazil
Nicolas Halbwachs, France
Kirsten Mark Hansen, Denmark
Anne Haxthausen, Denmark
Ian Hayes, Australia
Rick Hehner, Canada
Valérie Issarny, France
Rene Jacquart, France
Randolph Johnson, USA
Bengt Jonsson, Sweden
Leonid Kalinichenko, Russia
Kanchana Kanchanasut, Thailand

Kyo Chul Kang, Korea
Marite Kirikova, Latvia
Derrick Kourie, South Africa
Souleymane Koussoube, Burkina Faso
Reino Kurki-Suonio, Finland
Axel van Lamsweerde, Belgium
Jean-Claude Laprie, France
Peter Gorm Larsen, Denmark
Shaoying Liu, Japan
Peter Lucas, Austria
Micheal Mac an Airchinnigh, Ireland
Tom Maibaum, UK
Zohar Manna, USA
Lynn Marshall, Canada
Kees Middelburg, NL
Markus Montigel, Austria
Peter Mosses, Denmark
Friederike Nickl, Germany
Nikolai Nikitchenko, Ukraine
Roger Noussi, Gabon
Ernst-Rüdiger Olderog, Germany
José Nuno Oliveira, Portugal
Fernando Orejas, Spain
Paritosh Pandya, India
Jan Peleska, Germany
Frantisek Plásil, Czech Republic
Igor Prívara, Slovakia
Hans Rischel, Denmark
Ken Robinson, Australia
Teodor Rus, USA
Augusto Sampaio, Brazil
Georgy Satchock, Belarus
Kaisa Sere, Finland
Natarajan Shankar, USA
Joseph Sifakis, France
Doug Smith, USA
Radu Soricut, Rumania
Andrzej Tarlecki, Poland
T.H. Tse, Hong Kong
Bogdan Warinski, Rumania
Jeannette Wing, USA
Jim Woodcock, UK
Pamela Zave, USA
Zhou Chaochen, Macau

VIII Congress Organisation

Congress General Chair

Dines Bjørner

Programme Committee Co-chairs

Jeannette Wing and Jim Woodcock

Organisation Committee Chair

Rene Jacquart

Local Organisation and Publicity

Jacques Cazin

Congress Public Relations Officer

Jonathan Bowen

Congress Sponsors

AMAST

Aérospatiale Airbus

Alcatel Space

CCIT

CEPIS

CNES

CNRS

Cap Gemini

Carnegie-Mellon University

Conseil Regional Midi-Pyrenees

DGA

EATCS

ESA

ETAPS

European Union

FACS

FME

France Telecom

IFIP

INRIA

IPSJ

IRIT

JSSST

LAAS

Mairie de Toulouse

Matra Marconi Space

ONERA

Technical University of Delft

Technical University of Denmark

Technical University of Graz

Translimina

University of Oxford

University of Reading

FM'99 - Formal Methods

World Congress on Formal Methods in the Development
of Computing Systems, Toulouse, France, September
20-24, 1999 Proceedings, Volume II

Wing, J.M.; Woodcock, J.; Davies, J. (Eds.)

1999, XVIII, 942 p., Softcover

ISBN: 978-3-540-66588-5