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Jeannette M. Wing Jim Woodcock  
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# FM'99 – Formal Methods

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in the Development of Computing Systems  
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# 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.

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