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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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# Table of Contents

---

## Invited Papers

---

Theories of Programming: Top-Down and Bottom-Up Meeting in the Middle .....	1
<i>C. A. R. Hoare</i>	
Scientific Decisions which Characterise VDM .....	28
<i>C. B. Jones</i>	
Mechanized Formal Methods: Where Next? .....	48
<i>J. Rushby</i>	
Integration, the Price of Success .....	52
<i>J. Sifakis</i>	
The Role of Formalism in Method .....	56
<i>M. Jackson</i>	

---

## Integration into the Development Process

---

Formal Design for Automatic Coding and Testing: The ESSI/SPACES Project .....	57
<i>E. Conquet and J.-L. Marty</i>	
A Business Process Design Language .....	76
<i>H. Eertink, W. Janssen, P. O. Luttighuis, W. Teeuw, and C. Vissers</i>	

---

## Software Architecture

---

Refinement of Pipe-and-Filter Architectures .....	96
<i>J. Philipps and B. Rumpe</i>	
A Formalization of Software Architecture .....	116
<i>J. Herbert, B. Dutertre, R. Riemenschneider, and V. Stavridou</i>	

---

## European Association for Theoretical Computer Science (EATCS)

---

Component and Interface Refinement in Closed-System Specifications . . . .	134
<i>R. Kurki-Suonio</i>	
Semantics of First Order Parametric Specifications .....	155
<i>D. Pavlović</i>	

---

**Model Checking**


---

A Perfecto Verification: Combining Model Checking with Deductive Analysis to Verify Real-Life Software .....	173
<i>Y. Kesten, A. Klein, A. Pnueli, and G. Raanan</i>	
Error Detection with Directed Symbolic Model Checking .....	195
<i>F. Reffel and S. Edelkamp</i>	
Formal Modeling and Analysis of Hybrid Systems: A Case Study in Multi-robot Coordination .....	212
<i>R. Alur, J. Esposito, M. Kim, V. Kumar, and I. Lee</i>	
On-the-Fly Controller Synthesis for Discrete and Dense-Time Systems ...	233
<i>S. Tripakis and K. Altisen</i>	
On-the-Fly Verification of Linear Temporal Logic .....	253
<i>J.-M. Couvreur</i>	
Symbolic Model Checking with Fewer Fixpoint Computations .....	272
<i>D. Déharbe and A. M. Moreira</i>	
Formula Based Abstractions of Transition Systems for Real-Time Model Checking .....	289
<i>R. Barbuti, N. De Francesco, A. Santone, and G. Vaglini</i>	
IF: An Intermediate Representation and Validation Environment for Timed Asynchronous Systems .....	307
<i>M. Bozga, J.-C. Fernandez, L. Ghirvu, S. Graf, J.-P. Krimm, and L. Mounier</i>	
Automatic Verification of Pointer Data-Structure Systems for All Numbers of Processes .....	328
<i>F. Wang</i>	

---

**The B Method**


---

The Use of the B Formal Method for the Design and the Validation of the Transaction Mechanism for Smart Card Applications .....	348
<i>D. Sabatier and P. Lartigue</i>	
Météor: A Successful Application of B in a Large Project .....	369
<i>P. Behm, P. Benoit, A. Faivre, and J.-M. Meynadier</i>	
Formal Development of Databases in ASSO and B .....	388
<i>B. Matthews and E. Locuratolo</i>	

Interpreting the B-Method in the Refinement Calculus . . . . .	411
<i>Y. Rouzaud</i>	
Compositional Symmetric Sharing in B . . . . .	431
<i>M. Büchi and R. Back</i>	
Structural Embeddings: Mechanization with Method . . . . .	452
<i>C. Muñoz and J. Rushby</i>	
The Safe Machine: A New Specification Construct for B . . . . .	472
<i>S. Dunne</i>	
csp2B: A Practical Approach to Combining CSP and B . . . . .	490
<i>M. Butler</i>	
Test Criteria Definition for B Models . . . . .	509
<i>S. Behnia and H. Waeselynck</i>	

---

## Composition and Synthesis

---

Bunches for Object-Oriented, Concurrent, and Real-Time Specification . . .	530
<i>R. F. Paige and E. C. R. Hehner</i>	
Applications of Structural Synthesis of Programs . . . . .	551
<i>E. Tyugu, M. Matskin, and J. Penjam</i>	
Towards a Compositional Approach to the Design and Verification of Distributed Systems . . . . .	570
<i>M. Charpentier and K. M. Chandy</i>	

---

## Telecommunications

---

Formal Modeling in a Commercial Setting: A Case Study . . . . .	590
<i>A. Wong and M. Chechik</i>	
KVEST: Automated Generation of Test Suites from Formal Specifications	608
<i>I. Burdonov, A. Kossatchev, A. Petrenko, and D. Galter</i>	
Feature Interaction Detection Using Testing and Model-Checking Experience Report . . . . .	622
<i>L. du Bousquet</i>	
Emma: Developing an Industrial Reachability Analyser for SDL . . . . .	642
<i>N. Husberg and T. Manner</i>	
Correction Proof of the Standardized Algorithm for ABR Conformance . .	662
<i>J.-F. Monin and F. Klay</i>	

Verifying a Distributed Database Lookup Manager Written in Erlang . . . . 682  
*T. Arts and M. Dam*

**Security**

Secure Interoperation of Secure Distributed Databases . . . . . 701  
*F. Gilham, R. A. Riemenschneider, and V. Stavridou*

A Formal Security Model for Microprocessor Hardware . . . . . 718  
*V. Lotz, V. Kessler, and G. Walter*

Abstraction and Testing . . . . . 738  
*S. Schneider*

Formal Analysis of a Secure Communication Channel: Secure Core-Email  
 Protocol . . . . . 758  
*D. Zhou and S.-K. Chin*

Probabilistic Polynomial-Time Equivalence and Security Analysis . . . . . 776  
*P. Lincoln, J. Mitchell, M. Mitchell, and A. Scedrov*

A Uniform Approach for the Definition of Security Properties . . . . . 794  
*R. Focardi and F. Martinelli*

Group Principals and the Formalization of Anonymity . . . . . 814  
*P. F. Syverson and S. G. Stubblebine*

**Object-Orientation**

Developing BON as an Industrial-Strength Formal Method . . . . . 834  
*R. F. Paige and J. S. Ostroff*

On the Expressive Power of OCL . . . . . 854  
*L. Mandel and M. V. Cengarle*

A Systematic Approach to Transform OMT Diagrams to a B specification 875  
*E. Meyer and J. Souquières*

**Testing**

Verifying Consistency and Validity of Formal Specifications by Testing . . . 896  
*S. Liu*

A GSM-MAP Protocol Experiment Using Passive Testing . . . . . 915  
*M. Tabourier, A. Cavalli, and M. Ionescu*

**Author Index** . . . . . 935

# Table of Contents, Volume II

---

## Foundations of System Specification (IFIP WG 1.3)

---

From Informal Requirements to COOP: A Concurrent Automata Approach .....	939
<i>P. Poizat, C. Choppy, and J.-C. Royer</i>	
A Framework for Defining Object-Calculi .....	963
<i>F. Lang, P. Lescanne, and L. Liquori</i>	

---

## European Theory and Practice of Software (ETAPS)

---

A Translation of Statecharts to Esterel .....	983
<i>S. A. Seshia, R. K. Shyamasundar, A. K. Bhattacharjee, and S. D. Dhodapkar</i>	
An Operational Semantics for Timed RAISE .....	1008
<i>X. Yong and C. George</i>	
Data Abstraction for CSP-OZ .....	1028
<i>H. Wehrheim</i>	
Systems Development Using Z Generics .....	1048
<i>F. Polack and S. Stepney</i>	
A Brief Summary of VSPEC .....	1068
<i>P. Alexander, M. Rangarajan, and P. Baraona</i>	
Enhancing the Pre- and Postcondition Technique for More Expressive Specifications .....	1087
<i>G. T. Leavens and A. L. Baker</i>	

---

## Program Verification

---

On Excusable and Inexcusable Failures .....	1107
<i>M. Müller-Olm and A. Wolf</i>	
Interfacing Program Construction and Verification .....	1128
<i>R. Verhoeven and R. Backhouse</i>	
Software Verification Based on Linear Programming .....	1147
<i>S. Dellacherie, S. Devulder, and J.-L. Lambert</i>	

---

**Integration of Notation and Techniques**


---

Sensors and Actuators in TCOZ .....	1166
<i>B. Mahony and J. S. Dong</i>	
The UniForM Workbench, a Universal Development Environment for Formal Methods .....	1186
<i>B. Krieg-Brückner, J. Peleska, E.-R. Olderog, and A. Baer</i>	
Integrating Formal Description Techniques .....	1206
<i>B. Schätz and F. Huber</i>	

---

**Formal Description of Programming Concepts (IFIP WG 2.2)**


---

A More Complete TLA .....	1226
<i>S. Merz</i>	
Formal Justification of the Rely-Guarantee Paradigm for Shared-Variable Concurrency: A Semantic Approach .....	1245
<i>F. S. de Boer, U. Hannemann, and W.-P. de Roever</i>	
Relating Z and First-Order Logic .....	1266
<i>A. Martin</i>	

---

**Open Information Systems**


---

Formal Modeling of the Enterprise JavaBeans™ Component Integration Framework .....	1281
<i>J. P. Sousa and D. Garlan</i>	
Developing Components in the Presence of Re-entrance .....	1301
<i>L. Mihajlov, E. Sekerinski, and L. Laibinis</i>	
Communication and Synchronisation Using Interaction Objects .....	1321
<i>H. B. M. Jonkers</i>	
Modelling Microsoft COM Using $\pi$ -Calculus .....	1343
<i>L. M. G. Feijs</i>	

---

**Co-design**


---

Validation of Mixed SIGNAL-ALPHA Real-Time Systems through Affine Calculus on Clock Synchronisation Constraints .....	1364
<i>I. M. Smarandache, T. Gautier, and P. Le Guernic</i>	

Combining Theorem Proving and Continuous Models in Synchronous Design .....	1384
<i>S. Nadjm-Tehrani and O. Åkerlund</i>	
ParTS: A Partitioning Transformation System .....	1400
<i>J. Iyoda, A. Sampaio, and L. Silva</i>	
A Behavioral Model for Co-design .....	1420
<i>J. He</i>	

---

## Refinement

---

A Weakest Precondition Semantics for an Object-Oriented Language of Refinement .....	1439
<i>A. Cavalcanti and D. A. Naumann</i>	
Reasoning About Interactive Systems .....	1460
<i>R. Back, A. Mikhajlova, and J. von Wright</i>	
Non-atomic Refinement in Z .....	1477
<i>J. Derrick and E. Boiten</i>	
Refinement Semantics and Loop Rules .....	1497
<i>E. C. R. Hehner and A. M. Gravell</i>	

---

## Safety

---

Lessons from the Application of Formal Methods to the Design of a Storm Surge Barrier Control System .....	1511
<i>M. Chaudron, J. Tretmans, and K. Wijbrans</i>	
The Value of Verification: Positive Experience of Industrial Proof .....	1527
<i>S. King, J. Hammond, R. Chapman, and A. Pryor</i>	
Formal Development and Verification of a Distributed Railway Control System .....	1546
<i>A. E. Harthausen and J. Peleska</i>	
Safety Analysis in Formal Specification .....	1564
<i>K. Sere and E. Troubitsyna</i>	
Formal Specification and Validation of a Vital Communication Protocol .	1584
<i>A. Cimatti, P. L. Pieraccini, R. Sebastiani, P. Traverso, and A. Villafiorita</i>	
Incremental Design of a Power Transformer Station Controller Using a Controller Synthesis Methodology .....	1605
<i>H. Marchand and M. Samaan</i>	

---

**OBJ/Cafe OBJ/Maude**


---

Verifying Behavioural Specifications in CafeOBJ Environment .....	1625
<i>A. Mori and K. Futatsugi</i>	
Component-Based Algebraic Specification and Verification in CafeOBJ ..	1644
<i>R. Diaconescu, K. Futatsugi, and S. Iida</i>	
Using Algebraic Specification Techniques in Development of Object-Oriented Frameworks .....	1664
<i>S. Nakajima</i>	
Maude as a Formal Meta-tool .....	1684
<i>M. Clavel, F. Durán, S. Eker, J. Meseguer, and M.-O. Stehr</i>	
Hiding More of Hidden Algebra .....	1704
<i>J. Goguen and G. Roşu</i>	

---

**Abstract State Machines (ASM) and Algebraic Methods in Software  
Technology (AMAST)**


---

A Termination Detection Algorithm: Specification and Verification .....	1720
<i>R. Eschbach</i>	
Logspace Reducibility via Abstract State Machines .....	1738
<i>E. Grädel and M. Spielmann</i>	
Formal Methods for Extensions to CAS .....	1758
<i>M. N. Dunstan, T. Kelsey, U. Martin, and S. Linton</i>	
An Algebraic Framework for Higher-Order Modules .....	1778
<i>R. Jiménez and F. Orejas</i>	

---

**Avionics**


---

Applying Formal Proof Techniques to Avionics Software: A Pragmatic Approach .....	1798
<i>F. Randimbivololona, J. Souyris, P. Baudin, A. Pacalet, J. Raguideau, and D. Schoen</i>	
Secure Synthesis of Code: A Process Improvement Experiment .....	1816
<i>P. Garbett, J. P. Parkes, M. Shackleton, and S. Anderson</i>	
Cronos: A Separate Compilation Toolset for Modular Esterel Applications .....	1836
<i>O. Hainque, L. Pautet, Y. Le Biannic, and É. Nassor</i>	



---

**Works-in-Progress**


---

Tool Support for Production Use of Formal Techniques . . . . .	1854
<i>J. C. Knight, P. T. Fletcher, and B. R. Hicks</i>	
Modeling Aircraft Mission Computer Task Rates . . . . .	1855
<i>J. S. Dong, B. P. Mahony, and N. Fulton</i>	
A Study of Collaborative Work: Answers to a Test on Formal Specification in B . . . . .	1856
<i>H. Habrias, P. Poizat, and J.-Y. Lafaye</i>	
Archived Design Steps in Temporal Logic . . . . .	1858
<i>P. Kellomäki and T. Mikkonen</i>	
A PVS-Based Approach for Teaching Constructing Correct Iterations . . .	1859
<i>M. Lévy and L. Trilling</i>	
A Minimal Framework for Specification Theory . . . . .	1861
<i>B. Baumgarten</i>	
A Model of Specification-Based Testing of Interactive Systems . . . . .	1862
<i>I. MacColl and D. Carrington</i>	
Algebraic Aspects of the Mapping between Abstract Syntax Notation One and CORBA IDL . . . . .	1863
<i>R. Ocicǎ and D. Ionescu</i>	
Retrenchment . . . . .	1864
<i>R. Banach and M. Poppleton</i>	
Proof Preservation in Component Generalization . . . . .	1866
<i>A. M. Moreira</i>	

---

**Industrial Experience**


---

Formal Modelling and Simulation of Train Control Systems Using Petri Nets . . . . .	1867
<i>M. Meyer zu Hörste and E. Schnieder</i>	
Formal Specification of a Voice Communication System Used in Air Traffic Control . . . . .	1868
<i>J. Hörl and B. K. Aichernig</i>	
Model-Checking the Architectural Design of a Fail-Safe Communication System for Railway Interlocking Systems . . . . .	1869
<i>B. Buth and M. Schröner</i>	

Analyzing the Requirements of an Access Control Using VDMTools and PVS .....	1870
<i>G. Droschl</i>	
Cache Coherence Verification with TLA+ .....	1871
<i>H. Akhiani, D. Doligez, P. Harter, L. Lamport, J. Scheid, M. Tuttle, and Y. Yu</i>	
<b>Author Index</b> .....	1873

# Author Index

- Aichernig B. K. II-1868  
 Åkerlund O. II-1384  
 Akhiani H. II-1871  
 Alexander P. II-1068  
 Altisen K. I-233  
 Alur R. I-212  
 Anderson S. II-1816  
 Arts T. I-682  
  
 Back R. I-431, II-1460  
 Backhouse R. II-1128  
 Baer A. II-1186  
 Baker A. L. II-1087  
 Banach R. II-1864  
 Baraona P. II-1068  
 Barbuti R. I-289  
 Baudin P. II-1798  
 Baumgarten B. II-1861  
 Behm P. I-369  
 Behnia S. I-509  
 Benoit P. I-369  
 Bhattacharjee A. K. II-983  
 de Boer F. S. II-1245  
 Boiten E. II-1477  
 du Bousquet L. I-622  
 Bozga M. I-307  
 Büchi M. I-431  
 Burdonov I. I-608  
 Buth B. II-1869  
 Butler M. I-490  
  
 Carrington D. II-1862  
 Cavalcanti A. II-1439  
 Cavalli A. I-915  
 Cengarle M. V. I-854  
 Chandy K. M. I-570  
 Chapman R. II-1527  
 Charpentier M. I-570  
 Chaudron M. II-1511  
 Chechik M. I-590  
 Chin S.-K. I-758  
 Choppy C. II-939  
 Cimatti A. II-1584  
 Clavel M. II-1684  
 Conquet E. I-57  
 Couvreur J.-M. I-253  
  
 Dam M. I-682  
 De Francesco N. I-289  
 Déharbe D. I-272  
 Dellacherie S. II-1147  
 Derrick J. II-1477  
 Devulder S. II-1147  
 Dhodapkar S. D. II-983  
 Diaconescu R. II-1644  
 Doligez D. II-1871  
 Dong J. S. II-1166, II-1855  
 Droschl G. II-1870  
 Dunne S. I-472  
 Dunstan M. N. II-1758  
 Durán F. II-1684  
 Dutertre B. I-116  
  
 Edelkamp S. I-195  
 Eertink H. I-76  
 Eker S. II-1684  
 Eschbach R. II-1720  
 Esposito J. I-212  
  
 Faivre A. I-369  
 Feijs L. M. G. II-1343  
 Fernandez J.-C. I-307  
 Fletcher P. T. II-1854  
 Focardi R. I-794  
 Fulton N. II-1855  
 Futatsugi K. II-1625, II-1644  
  
 Galter D. I-608  
 Garbett P. II-1816  
 Garlan D. II-1281  
 Gautier T. II-1364  
 George C. II-1008  
 Ghirvu L. I-307  
 Gilham F. I-701  
 Goguen J. II-1704  
 Grädel E. II-1738  
 Graf S. I-307  
 Gravell A. M. II-1497  
  
 Habrias H. II-1856  
 Hainque O. II-1836  
 Hammond J. II-1527

- Hannemann U. II-1245  
 Harter P. II-1871  
 Haxthausen A. E. II-1546  
 He J. II-1420  
 Hehner E. C. R. I-530, II-1497  
 Herbert J. I-116  
 Hicks B. R. II-1854  
 Hoare C. A. R. I-1  
 Hörl J. II-1868  
 Huber F. II-1206  
 Husberg N. I-642  
  
 Iida S. II-1644  
 Ionescu D. II-1863  
 Ionescu M. I-915  
 Iyoda J. II-1400  
  
 Jackson M. I-56  
 Janssen W. I-76  
 Jiménez R. II-1778  
 Jones C. B. I-28  
 Jonkers H. B. M. II-1321  
  
 Kellomäki P. II-1858  
 Kelsey T. II-1758  
 Kessler V. I-718  
 Kesten Y. I-173  
 Kim M. I-212  
 King S. II-1527  
 Klay F. I-662  
 Klein A. I-173  
 Knight J. C. II-1854  
 Kossatchev A. I-608  
 Krieg-Brückner B. II-1186  
 Krimm J.-P. I-307  
 Kumar V. I-212  
 Kurki-Suonio R. I-134  
  
 Lafaye J.-Y. II-1856  
 Laibinis L. II-1301  
 Lambert J.-L. II-1147  
 Lamport L. II-1871  
 Lang F. II-963  
 Lartigue P. I-348  
 Leavens G. T. II-1087  
 Le Biannic Y. II-1836  
 Lee I. I-212  
 Le Guernic P. II-1364  
 Lescanne P. II-963  
 Lévy M. II-1859  
  
 Lincoln P. I-776  
 Linton S. II-1758  
 Liquori L. II-963  
 Liu S. I-896  
 Locuratolo E. I-388  
 Lotz V. I-718  
 Luttgheuis P. O. I-76  
  
 MacColl I. II-1862  
 Mahony B. P. II-1166, II-1855  
 Mandel L. I-854  
 Manner T. I-642  
 Marchand H. II-1605  
 Martin A. II-1266  
 Martin U. II-1758  
 Martinelli F. I-794  
 Marty J.-L. I-57  
 Matskin M. I-551  
 Matthews B. I-388  
 Merz S. II-1226  
 Meseguer J. II-1684  
 Meyer E. I-875  
 Meyer zu Hörste M. II-1867  
 Meynadier J.-M. I-369  
 Mikhajlov L. II-1301  
 Mikhajlova A. II-1460  
 Mikkonen T. II-1858  
 Mitchell J. I-776  
 Mitchell M. I-776  
 Monin J.-F. I-662  
 Moreira A. M. I-272, II-1866  
 Mori A. II-1625  
 Mounier L. I-307  
 Müller-Olm M. II-1107  
 Muñoz C. I-452  
  
 Nadjm-Tehrani S. II-1384  
 Nakajima S. II-1664  
 Nassor É. II-1836  
 Naumann D. A. II-1439  
  
 Ocică R. II-1863  
 Olderog E.-R. II-1186  
 Orejas F. II-1778  
 Ostroff J. S. I-834  
  
 Pacalet A. II-1798  
 Paige R. F. I-530, I-834  
 Parkes J. P. II-1816  
 Pautet L. II-1836  
 Pavlović D. I-155

- Peleska J. II-1186, II-1546  
Penjam J. I-551  
Petrenko A. I-608  
Philipps J. I-96  
Pieraccini P. L. II-1584  
Pnueli A. I-173  
Poizat P. II-939, II-1856  
Polack F. II-1048  
Poppleton M. II-1864  
Pryor A. II-1527
- Raanan G. I-173  
Raguideau J. II-1798  
Randimbivololona F. II-1798  
Rangarajan M. II-1068  
Reffel F. I-195  
Riemenschneider R. A. I-116, I-701  
de Roever W.-P. II-1245  
Roşu G. II-1704  
Rouzaud Y. I-411  
Royer J.-C. II-939  
Rumpe B. I-96  
Rushby J. I-48, I-452
- Sabatier D. I-348  
Samaan M. II-1605  
Sampaio A. II-1400  
Santone A. I-289  
Scedrov A. I-776  
Schätz B. II-1206  
Scheid J. II-1871  
Schneider S. I-738  
Schnieder E. II-1867  
Schoen D. II-1798  
Schrönen M. II-1869  
Sebastiani R. II-1584  
Sekerinski E. II-1301  
Sere K. II-1564  
Seshia S. A. II-983  
Shackleton M. II-1816  
Shyamasundar R. K. II-983
- Sifakis J. I-52  
Silva L. II-1400  
Smarandache I. M. II-1364  
Souquières J. I-875  
Sousa J. P. II-1281  
Souyris J. II-1798  
Spielmann M. II-1738  
Stavridou V. I-116, I-701  
Stehr M.-O. II-1684  
Stepney S. II-1048  
Stubblebine S. G. I-814  
Syverson P. F. I-814
- Tabourier M. I-915  
Teeuw W. I-76  
Traverso P. II-1584  
Tretmans J. II-1511  
Trilling L. II-1859  
Tripakis S. I-233  
Troubitsyna E. II-1564  
Tuttle M. II-1871  
Tyugu E. I-551
- Vaglini G. I-289  
Verhoeven R. II-1128  
Villaflorita A. II-1584  
Vissers C. I-76
- Waeselynck H. I-509  
Walter G. I-718  
Wang F. I-328  
Wehrheim H. II-1028  
Wijbrans K. II-1511  
Wolf A. II-1107  
Wong A. I-590  
von Wright J. II-1460
- Yong X. II-1008  
Yu Y. II-1871
- Zhou D. II-758