

Thirty years in Theoretical Computer Science

International Initiatives

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Initiatives

- The European Association for Theoretical Computer Science
- The Journal Theoretical Computer Science
- The IFIP Technical Committee for Foundations of Computer Science



The European Association for Theoretical Computer Science



EATCS: The foundation

- First meeting in Brussels: **January 1972**, coordinated by **A. Caracciolo**
- Idea: to create an Association for the promotion of research and education in theoretical computer science in Europe (on the model of EMBO)
- Theoretical computer science finds its first definition:
 - Theory of algorithms and complexity
 - Automata theory and formal languages
 - Theory of programming



EATCS: The foundation

- Foundation of EATCS: June 24, 1972
- First president Verbeek, secretary M. Nivat, other members: Ausiello, de Bakker, Paterson, Paul, Sintzoff
- Aims:
 - Organization of meetings and conferences
 - Dissemination of research results
 - Exchange of students and professors
 - Coordination and development of joint research projects




EATCS: The first steps

- First ICALP (actually “Théorie des automates, des langages et de la programmation”): July 1972
 - Automata and formal languages: 23 papers
 - Theory of programming: 11 papers
 - Complexity: 11 papers
- First General Assembly: March 1973
 - New President: Maurice Nivat
- First issue of Bulletin: December 1973



EATCS: The initiatives

- The International Colloquium on Automata, Languages and Programming
- The Bulletin
- The EATCS Series of Monographs
- National Chapters
- The Award to distinguished computer scientists (first awardee: Corrado Böhm)



EATCS: The evolution toward an international role

- Promotion of EU Research Programs (Global computing)
- Stronger cooperation with SIGACT
 - joint ICALP-STOC
 - Gödel prize



The Gödel prize

- Annual award for **outstanding papers** in theoretical computer science
- **Created in 1993**
- **Scientific areas:** complexity (3), approximation (2), logics of computation (2), cryptography (1), quantum computing (1), formal languages (1)
- This year award: **Y. Freund, R. Schapire: A decision theoretic generalization of on-line learning and an application to boosting** (Nominators: Valiant, Rivest)
- This year Committee: Giorgio Ausiello, Laszlo Babai, Zvi Galil, Juhani Karhumaki, **Dexter Kozen (chair)**, Ugo Montanari.



The Journal Theoretical Computer Science



TCS: The foundation

- First proposal of agreement with North Holland for the creation of the journal presented by Maurice Nivat to EATCS: **July 18, 1973**
- Originally: “The journal of the European Association for Theoretical Computer Science”
- Editor in Chief: **Maurice Nivat**, Associate Editor: **Mike Paterson**
- First volume in 1975
- The first editors: **de Bakker, Becvar, Böhm, Book, Engeler, Ershov, Harrison, Igarashi, Karp, Meyer, Milner, Park, Pawlak, Rabin, Salomaa, Schönage, Ullman**



TCS: The first volume

■ Topics:

- Algebraic complexity (Paterson, Schönage, Strassen)
- Unification in typed lambda-calculus (Huet)
- Developmental languages (Rozemberg)
- Complexity of inherent ambiguity (Savitch)
- Combinatorial properties of codes (Restivo)
- Polynomial time reducibilities (Ladner, Lynch, Selman)
- Call-by-name, call-by-value and lambda-calculus (Milner)
- Complexity of Boolean functions (Harper, Hsieh, Savage)
- Minimum storage for stable sorting (Preparata)
- Complexity of languages (Book)
- NP completeness of graph problems (Garey, Johnson)
- The information theoretic lower bound of sorting (Fredman)
- Mathematical foundation of information retrieval (Pawlak)



TCS: The first Special Issue

- Volume 13
- Guest Editor Robin Milner
- International Symposium on Semantics of Concurrent Computations



TCS: An overview

- Split into sections A and B since 1991
- Volume 300 just appeared
- 360 papers, about 8000 pages printed every year
- About 20 Special Issues every year (hot topics, important events)
- 5450 articles on line through Science Direct, 31332 downloads from April 2002 to April 2003
- Current Editors in Chief: G. Ausiello (TCS-A), Don sannella (TCS-B)



TCS: Today

- Special Issues in preparation
 - Pattern discovery (Apostolico, Giancarlo)
 - On line algorithms (Fiat, Irani)
 - Web algorithms (Broder)
 - Game theory meets computer science (Mavronicholas, Abramsky)
 - Beyond Turing (Burgin)
- New section on ‘Natural computing’ edited by G. Rozenberg



The IFIP Technical Committee for Foundations of Computer Science



The Special Interest Group for Foundations of Computer Science

- Created in 1990
- Chairman Jozef Gruska
- Aim: To promote the role of theoretical computer science within IFIP
 - cooperation with other TCs
 - presence of theory tracks at World Congresses
 - eventually, creation of IFIP TC for theoretical computer science



TC1: The first steps

- Active since 1997
- First Chairman: G. Ausiello
- Current Chairman: T. Ito
- First initiatives:
 - Establish working groups (WGs)
 - Promote workshops and conferences
 - Cooperate with initiatives of other TCs



TC1: Aims

- To support development of theoretical computer science as a fundamental science that has similar scientific goals in understanding the information processing world as physics has in understanding the energy processing world and similar goals in developing methodology for science and technology as mathematics does.
- To support the development and exploration of fundamental concepts, models, theories, systems, and other basic tools and the understanding of laws, limits and possibilities of information processing as well as to develop bridges with other sciences and their applications.



TC1: Scope

- Frontiers, laws and limits of information processing
- Fundamental formal systems
- Efficiency and complexity of information processing
- Formal systems to specify, design, verify, analyse and manipulate complex information processing systems
- Theoretical foundations of various fields of computer science
- Scientific paradigms of informatics and their relations to other disciplines
- Information processing fundamental concepts, models and theories to support the development of (foundations of) other sciences



TC1: The Working Groups

- 1.1 Continuous algorithms and complexity (J. Traub)
- 1.2 Descriptive complexity (D. Wotschke)
- 1.3 Foundations of system specifications (P. Mosses)
- 1.4 Computational Learning (A. Sharma)
- 1.5 Cellular automata (G. Mauri)
- 1.6 Term rewriting (C. Kirchner)
- 1.7 Theoretical foundations of security (R. Gorrieri)



TC1: The Conference 'Theoretical Computer Science'

- Co-located with IFIP World Congresses
- Supervised by Steering Committee
- Truly international involvement
- Focused on hot topics
- 120 submissions in each past edition



TC1: The Conference 'Theoretical Computer Science'

- TCS 2000 (Sendai, Japan)
 - PC Chairs: van Leeuwen, Mosses, Hagiya, Watanabe
 - General Chair: T. Ito
- TCS 2002 (Montreal, Canada)
 - PC Chairs: Baeza-Yates, Montanari
 - General Chair: N. Santoro
- TCS 2004 (Toulouse, France)
 - PC Chairs: Mayr, Mitchell
 - General Chair: J.J. Levy