

Preface to Special Issue: Theory and Applications of Models of Computation (TAMC)

JIN-YI CAI[†], S. BARRY COOPER[‡] and ANGSHENG LI[§]

[†]*Sciences Department, University of Wisconsin, Madison, WI 53706, U.S.A*
Email: jyc@cs.wisc.edu

[‡]*School of Mathematics, University of Leeds, Leeds LS2 9JT, U.K.*
Email: pmt6sbc@leeds.ac.uk

[§]*Institute of Software, Chinese Academy of Sciences, Beijing 100080, China*
Email: angsheng@ios.ac.cn

Received July 2008

Theory and Applications of Models of Computation (TAMC) is an international conference series with an interdisciplinary character bringing together researchers working in computer science, mathematics (especially logic) and the physical sciences. This interdisciplinary approach, with an emphasis on the theory of computation in a broad sense, gives the series its special appeal within China and internationally. At a time when the pressures are increasingly towards narrowly *ad hoc* research, and scientific fragmentation, meetings that reassert the importance of theory, fundamental concepts and a wider perspective have an important role to play.

TAMC 2007 was the 4th conference in the series. The previous meetings were held on 17–19 May 2004 in Beijing, 17–20 May 2005 in Kunming and 15–20 May 2006 in Beijing, P.R.China. Subsequent TAMC meetings include the 5th Annual Conference on Theory and Applications of Models of Computation (TAMC'08), which was held in Xi'an, and the 6th Annual Conference on Theory and Applications of Models of Computation (TAMC'09) to be held on 26–30 May 2009 in ChangSha. It is expected that 2010 will see the first TAMC meeting outside China, with a provisional plan for it to be held in Prague in the Czech Republic.

The enthusiasm with which TAMC 2007 has been received by the scientific community is evident in the large number of high quality articles submitted to the conference. There were over 500 submissions, originating from all over the World. This presented the Program Committee with a major assessment task. The Program Committee finally selected sixty-seven papers for presentation at the conference and inclusion in the Proceedings. This represents an acceptance rate of just over 13%, making TAMC an extremely selective conference compared with other leading international conferences. At TAMC 2007 there were also two plenary speakers, and two Special Sessions on *Models of Computation* and on *Algorithms and Complexity*.

Drawing on these contributions, this Special Issue of *Mathematical Structures in Computer Science* contains twelve invited papers around the theme of Computability and Mathematical Models of Computation. It includes selected papers from those accepted for TAMC 2007, and two articles from invited speakers in the *Computability and Randomness* special session organised by Barry Cooper and Andrew Lewis. This is one of three special

issues for TAMC 2007, each on a different thematic area, to be published by *Mathematical Structures in Computer Science*, the *Journal of Computer Science and Technology* and *Theoretical Computer Science*, series A.

The TAMC conference series arose naturally in response to important scientific developments affecting how we compute in the twenty-first century. At the same time, TAMC is already playing an important regional and international role, and promises to become a key contributor to the scientific resurgence seen throughout China and other parts of Asia. TAMC is particularly recognised as addressing the need to develop a strong theoretical base for computer scientific progress, and has become the most truly international on the emergent conference scene. The excellence of the papers to be found here are fitting signifiers of this growing international involvement.

We would like to thank our fellow Programme Committee members, and the many outside referees they called on, for the hard work and expertise that they have brought to the difficult selection process consequent on the unprecedented volume of submissions to TAMC 2007:

Giorgio Ausiello (Rome, Italy)
Eric Bach (UW Madison)
Nicolo Cesa-Bianchi (Milano, Italy)
Jianer Chen (Texas A&M University)
Yijia Chen (Shanghai Jiaotong University)
Francis Chin (Hong Kong)
C.T. Chong (Singapore)
Kyung-Yong Chwa (KAIST, Korea)
Decheng Ding (Nanjing University)
Rod Downey (Wellington)
Martin Dyer (Leeds)
Rudolf Fleischer (Fudan University)
Oscar Ibarra (UC Santa Barbara)
Hiroshi Imai (University of Tokyo)
Kazuo Iwama (Kyoto University)
Tao Jiang (University of California-Riverside/Tsinghua, Beijing)
Satyanarayana Lokam (Microsoft Research-India)
D T Lee (Academia Sinica, Taipei)
Giuseppe Longo (Paris, France)
Tian Liu (Beijing University)
Rudiger Reischuk (Universitat zu Lubeck)
Rocco Servedio (Columbia University)
Alexander Shen (Institute for Information Transmission Problems, Moscow)
Yaoyun Shi (University of Michigan, Ann Arbor)
Ted Slaman (UC Berkeley)
Xiaoming Sun (Tsinghua University)
Luca Trevisan (UC Berkeley)
Christopher Umans (Cal Tech)

Alasdair Urquhart (University of Toronto)
Hanpin Wang (Beijing University)
Osamu Watanabe (Tokyo Institute of Technology)
Zhiwei Xu (Institute of Computing Technology, CAS)
Frances Yao (City University of Hong Kong)
Mingsheng Ying (Tsinghua University, Beijing)
Hong Zhu (Fudan University, Shanghai)

Most importantly, we would like to thank the participants and speakers for making the event such a resounding success. We also express our appreciation to Professor Giuseppe Longo and the members of the Editorial Board of *Mathematical Structures in Computer Science* for their encouragement and advice throughout the preparation of TAMC 2007, and this Special Issue.

Of course TAMC 2007 would not have been possible without the support of our sponsors:

The National Natural Science Foundation of China
Information School of Fudan University
Institute of Software, Chinese Academy of Sciences
Microsoft Research, Asia,

and we therefore gratefully acknowledge their help in the realisation of the 2007 TAMC conference, and their indirect but essential contribution to the quality of this Special Issue.

Jin-Yi Cai
S. Barry Cooper
Angsheng Li
Special Issue Editors