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Dongming Wang (Eds.)

Artificial Intelligence and Symbolic Computation

8th International Conference, AISC 2006
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Proceedings

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Foreword

AISC 2006, the 8th International Conference on Artificial Intelligence and Symbolic Computation, was held on the campus of Beihang University, China, in the golden autumn of 2006. On behalf of the Organizing Committee and Beihang University, I had the pleasure to welcome the participants of this conference. The AISC series of specialized biennial conferences was founded in 1992 by Jacques Calmet and John Campbell with initial title “Artificial Intelligence and Symbolic Mathematical Computing” (AISMC) and the previous seven conferences in this series were held in Karlsruhe (AISMC-1, 1992), Cambridge (AISMC-2, 1994), Steyr (AISMC-3, 1996), Plattsburgh, NY (AISC 1998), Madrid (AISC 2000), Marseille (AISC 2002), and Hagenberg, Austria (AISC 2004).

Artificial intelligence and symbolic computation are two views and approaches for automating (mathematical) problem solving. They are based on heuristics and mathematical algorithmics, respectively, and each of them can be applied to the other. The AISC series of conferences has not only provided a lively forum for researchers to exchange ideas and views and to present work and new findings, but has also stimulated the development of theoretical insights and results, practical methods and algorithms, and advanced tools of software technology and system design in the interaction of the two fields and research communities, meanwhile leading to a broad spectrum of applications by the combined problem solving power of the two fields.

The success of the AISC series has benefited from the contributions of many people over the last decade. For AISC 2006, the Program Committee and, in particular, its Chair Tetsuo Ida deserve special credits: it is their expertise and tireless effort that made an excellent scientific program. I am most grateful to the four distinguished invited speakers, Arjeh M. Cohen, Heisuke Hironaka, William McCune, and Wen-tsün Wu, whose participation and speeches definitely helped make AISC 2006 a unique and high-level scientific event. The AISC 2006 General Chair, Dongming Wang, and Local Arrangements Chair, Shilong Ma, together with their organization team made considerable effort on many aspects to ensure the conference was successful. I would like to thank all the above-mentioned individuals, other Organizing Committee Members, referees, authors, participants, our staff members and students, and all those who have contributed to the organization and success of AISC 2006.

September 2006

Wei Li
Honorary Chair
AISC 2006
President of Beihang University

Preface

This volume contains invited presentations and contributed papers accepted for AISC 2006, the 8th International Conference on Artificial Intelligence and Symbolic Computation held during September 20–22, 2006 in Beijing, China. The conference took place on the campus of Beihang University and was organized by the School of Science and the School of Computer Science and Engineering, Beihang University.

In the AISC 2006 call for papers, original research contributions in the fields of artificial intelligence (AI) and symbolic computation (SC), and in particular in the fields where AI and SC interact were solicited. In response to the call, 39 papers were submitted. This volume contains 18 contributed papers, selected by the Program Committee on the basis of their relevance to the themes of AISC and the quality of the research expounded in the papers. The program of the conference featured 5 invited talks, out of which 4 presentations are included in the proceedings.

The papers in this volume cover a broad spectrum of AI and SC. The papers may be characterized by key words such as theorem proving, constraint solving/satisfaction, term rewriting, deductive system, operator calculus, quantifier elimination, triangular set, and mathematical knowledge management. Despite the breadth of the papers, we can observe their mathematical aspect in common.

For 15 years since the conception of AISMC (AI and Symbolic Mathematical Computing), changed to AISC in 1998, the mathematical aspect has remained as the common profile of the conferences. We see challenges as the problems that we face become more complex with the rapid development of computer technologies and the transformation of our society to an *e*-society. Such problems are tackled by using mathematical tools and concepts, which become highly sophisticated. The interaction of AI and SC bound by mathematics will become more relevant in problem solving. We hope that this unique feature of the conference will remain and gather momentum for further expansion of AISC.

We would like to express our thanks to the Program Committee members and external reviewers for their efforts in realizing this high-quality conference. Our thanks are also due to Wei Li, President of Beihang University, and the Local Arrangements Committee chaired by Shilong Ma for making the conference such a success.

We acknowledge the support of EasyChair for administering paper submissions, paper reviews and the production of the proceedings. With its support, the whole preparation process for the AISC 2006 program and proceedings was streamlined.

September 2006

Jacques Calmet
Tetsuo Ida
Dongming Wang

Organization

AISC 2006, the 8th International Conference on Artificial Intelligence and Symbolic Computation, was held at Beihang University, Beijing, September 20–22, 2006. The School of Science and the School of Computer Science and Engineering, Beihang University were responsible for the organization and local arrangements of the conference. AISC 2006 was also sponsored by the State Key Laboratory of Software Development Environment and the Key Laboratory of Mathematics, Informatics and Behavioral Semantics of the Ministry of Education of China.

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