

Preface

AISC 2004, the 7th International Conference on Artificial Intelligence and Symbolic Computation, was the latest in the series of specialized biennial conferences founded in 1992 by Jacques Calmet of the Universität Karlsruhe and John Campbell of University College London with the initial title *Artificial Intelligence and Symbolic Mathematical Computing (AISM C)*. The M disappeared from the title between the 1996 and 1998 conferences. As the editors of the AISC 1998 proceedings said, *the organizers of the current meeting decided to drop the adjective ‘mathematical’ and to emphasize that the conference is concerned with all aspects of symbolic computation in AI: mathematical foundations, implementations, and applications, including applications in industry and academia.*

This remains the intended profile of the series, and will figure in the call for papers for AISC 2006, which is intended to take place in China. The distribution of papers in the present volume over all the areas of AISC happens to be rather noticeably mathematical, an effect that emerged because we were concerned to select the best relevant papers that were offered to us in 2004, irrespective of their particular topics; hence the title on the cover. Nevertheless, we encourage researchers over the entire spectrum of AISC, as expressed by the 1998 quotation above, to be in touch with us about their interests and the possibility of eventual submission of papers on their work for the next conference in the series.

The papers in the present volume are evidence of the health of the field of AISC. Additionally, there are two reasons for optimism about the continuation of this situation.

The first is that almost all the items in the list of useful areas for future research that the editors of the proceedings of the first conference in 1992 suggested in a ‘state of the field’ paper there are represented in AISC 2004. Many have of course been present in other AISC conferences too, but never so many as in this year’s conference: theorem proving, expert systems, qualitative reasoning, Gröbner bases, differential and integral expressions, computational group theory, constraint-based programming, specification (implying verification), and instances of automated learning, for example. The only major items from the 1992 list that would be needed here to make up what poker players might call a full house are knowledge representation and intelligent user interfaces for mathematical tasks and mathematical reasoning – but while a word search in this volume may not find them, ingredients of both are undoubtedly present this year. (For a hint, see the next paragraph.)

The second of our reasons for an optimistic view of AISC is the maturation of a scientific proposal or prediction that dates back to 1985. In founding the Journal of Symbolic Computation in that year, one of us proposed that SC should encompass both exact mathematical algorithmics (computer algebra) and automated reasoning. Only in recent years has an integration and interaction of these two fields started to materialize. Since 2001 in particular, this has given

rise to the MKM (mathematical knowledge management) ‘movement’, which considers seriously the automation of the entire process of mathematical theory exploration. This is now one of the most promising areas for the application of AI methods in general (for invention or discovery of mathematical concepts, problems, theorems and algorithms) to mathematics/SC and vice versa.

We are happy to be continuing the fruitful collaboration with Springer which started with the first AISMC conference in 1992 and which permitted the publication of the proceedings in the Lecture Notes in Computer Science (LNCS 737, 958, 1138) series from 1992 to 1996 and the Lecture Notes in Artificial Intelligence (LNAI 1476, 1930, 2385) series subsequently.

We, the AISC steering committee, and the organizers of the conference, are grateful to the following bodies for their financial contributions towards its operation and success: Linzer Hochschulfonds, Upper Austrian Government, FWF (Austrian Science Foundation), Raiffeisenlandesbank Upper Austria, Siemens Austria, IBM Austria, and CoLogNET.

Our thanks are also due to the members of the program committee and several additional anonymous referees, and to those who ensured the effective running of the actual conference and its Web sites.

In this latter connection, we administered the submission and selection of papers for AISC 2004 entirely through special-purpose conference software for the first time in the history of AISC, using the START V2 conference manager described at **www.softconf.com**. This contributed substantially to the efficiency of the whole process, and allowed us to respect an unusually tight set of deadlines. We appreciate the prompt and helpful advice on using this software that we received from Rich Gerber whenever we needed it.

The effectiveness of the final stage of production of this volume was due mainly to the intensive work of Theodoros Pagtzis. We express our gratitude to him.

July 2004

Bruno Buchberger
John Campbell

Organization

AISC 2004, the 7th international conference on Artificial Intelligence and Symbolic Computation, was held at Schloss Hagenberg, near Linz, during 22–24 September 2004.

The Research Institute for Symbolic Computation (RISC) of the Johannes-Kepler Universität Linz, and the Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences (Österreichische Akademie der Wissenschaften), Linz were jointly responsible for the organization and the local arrangements for the conference.

Conference Direction

Conference Chair	Bruno Buchberger (Johannes-Kepler-Universität Linz)
Program Chair	John Campbell (University College London, UK)

Local Arrangements

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Logic Programming Tutorial	Klaus Trümper (University of Texas at Dallas)

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