

## Foreword

This volume contains the invited papers, contributed papers, and poster summaries accepted for the Fifth International Conference on Artificial Intelligence and Symbolic Computation (AISC 2000). The conference was held in Spain from 17 to 19 July 2000 at the Hotel NH Zurbano, Madrid, and was organized by the Universidad Complutense de Madrid and the Sociedad Matemática Puig Adam.

One of the reasons for centralizing all activities at one hotel was to avoid both losing time in transportation around Madrid and the distribution of the attendees into disconnected subgroups in diverse locations. In this way a breakfast-to-late-night coexistence (which included some extra-academic events) was ensured, with time for formal and informal conversations. This continued the AISMC/AISC tradition of the creation of a friendly atmosphere, where ideas could be exchanged in a relaxed and effective way.

The conference belongs to a specialized conference series founded by John Campbell and Jacques Calmet with the initial title “Artificial Intelligence and Symbolic Mathematical Computation” (AISMC). AISMC-1 took place in 1992 in Karlsruhe (Germany); AISMC-2 was held in 1994 at King’s College (Cambridge, UK), and AISMC-3 in 1996 was located in Steyr (Austria). The proceedings of these conferences were published in Springer’s LNCS series as volumes 737, 958, and 1138, respectively.

The Steering Committee then decided to drop the word “Mathematical” from the name of the conference series (and the “M” in the acronym) to emphasize that the conference was not only related to Mathematics but to all aspects of symbolic computation. Therefore, the proceedings from that time onwards have been transferred to Springer’s LNAI series from LNCS. Our first conference after that decision, AISC’98, took place in Plattsburgh (NY, USA) during 1998. Its papers appeared as volume 1476 of the LNAI series.

The next conference in the same field, AISC 2002, will be held in Nice (France).

The field includes a wide range of activities, such as Automated Theorem Proving, Logical Reasoning, Mathematical Modeling of Multi-agent Systems, Expert Systems and Machine Learning, Engineering, and Industrial Applications. Despite this breadth of coverage, the program committee has (as in previous conferences) kept the number of accepted papers low, following a strict refereeing process, to avoid any necessity for parallel sessions and to allow longer than usual presentations and periods for questions and discussion. A poster session was included in 2000 for the first time in an AISC conference; short accounts of some of the research covered in posters is included here.

In some of the past AISMC/AISC volumes and in papers in related journals such as the *Annals of Mathematics* and *Artificial Intelligence*, forecasts have been made about the areas of likely and promising future research in topics that the conferences cover. As the saying goes, “it is always difficult to predict, especially to predict the future”; so, it is not embarrassing to observe that some

of the predictions have still to match what is actually happening. But others, such as the explicit representation (for computer-based use) of mathematical knowledge, are now emerging, as the present volume shows. The fact that this issue of representation has been encouraged indirectly by the expansion of the World-Wide Web and more directly by the existence of HTML and various subsequent ...MLs was not something that was predicted – but such unexpected synergies show that the AISC area is not only alive and well, but is still capable of generating pleasant scientific surprises.

The book begins with the papers from the three invited speakers. The papers that follow have been grouped so that the topics of successive items are as close together as possible.

We acknowledge gratefully the generous sponsors of AISC 2000: the Universidad Complutense de Madrid (through different sources: the “Convocatoria 1999 para la Organización de Reuniones, Congresos y Seminarios”, its Department of Algebra and its “Servicios Informáticos”), the Spanish software sales representative “Addlink Software Científico”, the companies Texas Instruments and Logic Programming Associates (LPA), the “Real Sociedad Matemática Española”, and the “Sociedad Matemática Puig Adam”.

We also express our warm thanks to the members of the Steering Committee and Scientific Committee for refereeing contributed papers and their most valuable help in making AISC 2000 a success. We would like to thank additionally the members of the Local Committee, who faced all the “behind the curtains” work, and especially Professor Roanes-Macías for taking care of all the unpleasant and endless economic details. Finally we put on record our thanks to the director of the corresponding BBVA bank office (Mr. Miguel Santos) for his kindness and efficiency; the travel agency “Viajes Eurobusiness” for their good work and for trusting the local organizers of the conference by not asking for the usual imposing financial guarantees in advance, and the management and staff of the Hotel NH Zurbano for the facilities provided for the conference.

January 2001

John Campbell  
Eugenio Roanes-Lozano

# Organization

## Steering Committee

Jacques Calmet (Univ. Karlsruhe, Germany)  
John Campbell (Univ. College, London, United Kingdom)  
Jochen Pfalzgraf (Univ. Salzburg, Austria)  
Jan Plaza (SUNY-Plattsburgh, USA)  
Eugenio Roanes-Lozano (Univ. Complutense de Madrid, Spain),  
Conference Chairman

## Program Committee

Luigia C. Aiello (Univ. La Sapienza, Roma, Italy)  
José A. Alonso (Univ. de Sevilla, Spain)  
Michael Beeson (San Jose State Univ., USA)  
Bruno Buchberger (RISC-Linz, Austria)  
Alan Bundy (Univ. Edinburgh, UK)  
Greg Butler (Univ. Concordia, Montreal, Canada)  
Frans P. Coenen (Univ. of Liverpool, UK)  
Jim Cunningham (Imperial College London, UK)  
Carl van Geem (LAAS-CNRS, Toulouse, France)  
Fausto Giunchiglia (Univ. Trento, Italy)  
Martin C. Golumbic (Bar-Ilan Univ., Israel)  
Leon A. Gonzalez (Univ. de Alcala, Spain)  
Anthony J. Guttman (Univ. of Melbourne, Australia)  
Reiner Haehnle (Univ. Karlsruhe, Germany)  
Deepak Kapur (Univ. New Mexico, USA)  
Luis de Ledesma (Univ. Politecnica de Madrid, Spain)  
Ursula Martin (Univ. of St. Andrews/SRI, Scotland)  
José Mira (UNED, Spain)  
Ewa Orłowska (Inst. Telecommunications, Warsaw, Poland)  
Angel Pasqual del Pobil (Univ. Jaume I, Spain)  
Juan Pazos (Univ. Politecnica de Madrid, Spain)  
Zbigniew W. Ras (Univ. North Carolina, Charlotte, USA)  
Tomas Recio (Univ. de Santander, Spain)  
Joerg Siekmann (Univ. Saarland, Saarbrücken, Germany)  
Andrzej Skowron (Warsaw Univ., Poland)  
Viorica Sofronie-Stokkermans (Max Planck Institut, Germany)  
Stanly Steinberg (Univ. New Mexico, USA)  
Karel Stokkermans (Univ. Salzburg, Austria)  
Carolyn Talcott (Stanford Univ., USA)  
Rich Thomason (Univ. of Pittsburgh, USA)

## VIII Organization

Peder Thusgaard Ruhoff (Univ. of Southern Denmark, Denmark)  
Enric Trillas (Univ. Politecnica de Madrid, Spain)  
Dongming Wang (IMAG Grenoble, France)

### **Local Committee**

Francisco J. Blanco-Silva (Purdue Univ., USA)  
Martin Garbayo (Univ. Complutense de Madrid, Spain)  
Mercedes Hidalgo (Univ. Complutense de Madrid, Spain)  
Eugenio Roanes-Macias (Univ. Complutense de Madrid, Spain)  
Lola Rodriguez (CPR Leganes)