

## Preface

The European Society for Artificial Intelligence in Medicine (AIME) was established in 1986 with two main goals: 1) to foster fundamental and applied research in the application of Artificial Intelligence (AI) techniques to medical care and medical research, and 2) to provide a forum for reporting significant results achieved at biennial conferences. Additionally, AIME assists medical industrials to identify new AI techniques with high potential for integration into new products. A major activity of this society has been a series of international conferences, from Marseille (FR) in 1987 to Cascais (PT) in 2001, held biennially over the last 16 years.

The AIME conference provides a unique opportunity to present and improve the international state of the art of AI in medicine from both a research and an applications perspective. For this purpose, the AIME conference includes invited lectures, contributed papers, system demonstrations, tutorials and workshops. The present volume contains the proceedings of the AIME 2003 conference, the ninth conference on Artificial Intelligence in Medicine in Europe, held in Cyprus, October 18–22, 2003.

In the AIME 2003 conference announcement, we encouraged authors to submit original contributions to the development of theory, techniques, and applications of AI in medicine, including the evaluation of health care programs. Theoretical papers should include a prospective part about possible applications to medical problems solving. Technical papers should describe the novelty of the proposed approach, its assumptions and pros and cons compared to other alternative techniques. Application papers should present sufficient information to allow the evaluation of the practical benefits of the proposed system or methodology.

The call for papers for AIME 2003 resulted in 65 papers. All papers were carefully evaluated by at least two independent referees from the program committee with support from additional reviewers. Submissions came from 18 countries with 5 outside Europe. This confirms the international interest for an AI in medicine conference. The reviewers judged the originality, the quality, and the significance of the proposed research, as well as its presentation and its relevance to the AIME conference. All submissions were ranked based on two aspects: the overall recommendation of each reviewer and a quantitative score obtained from all aspects of the detailed review. In general, the two aspects were in compliance: a highly positive recommendation corresponded to a high qualitative score. In the very few where discrepancies appeared, a careful evaluation of each review and a deep examination of the paper were performed by the program committee and the organizing committee chair before reaching a final decision.

As a result, 24 papers were accepted as full papers (a 37% acceptance rate) for oral presentation. Each of them received a high overall ranking and two positive recommendations, of which at least one was highly positive. Ten papers have

been allocated to each full paper in this volume. In addition, 26 papers were accepted as short papers for poster presentation. Each of them also received two positive recommendations. Five pages have been allocated to each short paper in this volume. All accepted papers were organized under nine themes during the AIME 2003 conference and in this volume. These themes reflect the current interests of researchers in AI in medicine. Temporal reasoning, from the interpretation of high-frequency data to the modeling of high level abstractions, is a persistent research theme. AI techniques for image processing seem very promising in particular for neuroimaging applications. The construction of ontologies based on medical terminologies or free-texts has generated theoretical (logics based) and technical papers. The growing medical interest for protocol and guidelines-based care is motivating the development of specific frameworks and methodologies for their representation, verification, learning, and sharing. Probabilistic networks and bayesian models remain representational frameworks well adapted to medical information and a dynamic research field. The need for computerized assistance for medical decision making from diagnosis to treatment planning has encouraged several applications papers. Finally, machine learning, data mining, and knowledge discovery appear as central techniques for data analysis in various medical domains.

The modeling, using computerized techniques, of biological systems from genetic networks to highly cognitive mechanisms, is still largely debated and has been since the beginning of AI. Two speakers were invited to discuss these points in the light of the more recent results in computer simulation of biological phenomena and robotics. Two extended abstracts of these invited lectures are included at the end of this volume.

We would like to emphasize the high quality of the papers selected in this volume, demonstrating the vitality and diversity of research in Artificial Intelligence in medicine and the interest of specific medias, literature, and conferences devoted to this field.

We would like to thank all the people and institutions who contributed to the success of the AIME 2003 conference: the authors, the members of the program committee as well as additional reviewers, all the members of the organizing committee, the invited speakers Zoltan Szallasi and Phillipe Gaussier. Moreover, we would like to thank the organizers of the two workshops, Ameen Abu-Hanna and Jim Hunter, and Peter Lucas. Finally, we would like to thank the University of Cyprus for sponsoring the conference.

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# Organization

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