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Artificial Intelligence in Medicine

10th Conference on Artificial Intelligence in Medicine, AIME 2005
Aberdeen, UK, July 2005, Proceedings

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Lecture Notes in Artificial Intelligence 3581

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

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 at biennial conferences for reporting significant results achieved. Additionally, AIME assists medical industrialists 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 held biennially over the last 18 years: Marseilles, France (1987), London, UK (1989), Maastricht, Netherlands (1991), Munich, Germany (1993), Pavia, Italy (1995), Grenoble, France (1997), Aalborg, Denmark (1999), Cascais, Portugal (2001), Protaras, Cyprus (2003).

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, a doctoral consortium, tutorials, and workshops. The present volume contains the proceedings of AIME 2005, the 10th conference on Artificial Intelligence in Medicine, held in Aberdeen, Scotland, July 23-27, 2005.

In the AIME 2005 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 were to include presentation or analysis of the properties of novel AI methodologies potentially useful to solving medical problems. Technical papers were to describe the novelty of the proposed approach, its assumptions, benefits, and limitations compared with other alternative techniques. Application papers were to present sufficient information to allow the evaluation of the practical benefits of the proposed system or methodology.

This year we received an all-time high number of very well-elaborated scientific paper submissions (148 paper submissions, 128% more than for AIME 2003). All papers were carefully evaluated by at least two independent reviewers from the program committee with support from additional reviewers. Submissions came from 32 different countries including 13 outside Europe. This emphasizes 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 on four aspects: the overall recommendation of each reviewer, the reviewer's confidence in the subject area of the paper, the quantitative scores obtained from all aspects of the detailed review, and the reviewer's detailed comments.

A small selection committee was established consisting of the AIME 2003 Program Chair Michel Dojat, the AIME 2003 Organizing Chair Elpida Keravnou, the AIME 2005 Program Chair Silvia Miksch, and the AIME 2005 Organizing Chair Jim Hunter. In the middle of April 2005 this committee met in Vienna to make the final decisions on the AIME 2005 program (scientific papers, doctoral consortium, tutorials, and workshops).

As a result we accepted 35 full papers (a 23.6% 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 pages were allocated to each full paper in this volume and 25 minutes of oral presentation during the conference. In addition, we accepted 34 short papers for poster presentation (a 23.0% acceptance rate). Each of them also received two positive recommendations. Five pages have been allocated to each short paper in this volume. The poster presenters had 5 minutes to present their papers, and their posters were shown throughout the main AIME 2005 conference to allow for fruitful discussions with the audience.

The papers and the sessions were organized according to the following themes: (1) Temporal Representation and Reasoning, (2) Decision Support Systems, (3) Clinical Guidelines and Protocols, (4) Ontology and Terminology, (5) Case-Based Reasoning, Signal Interpretation, Visual Mining, (6) Computer Vision and Imaging, (7) Knowledge Management, and (8) Machine Learning, Knowledge Discovery and Data Mining. These themes reflect the current interests of researchers in AI in medicine. The high quality of the papers selected in this volume demonstrates the vitality and diversity of research in Artificial Intelligence in Medicine.

Two invited speakers gave talks on two challenging topics in AIME. Frank van Harmelen (Vrije Universiteit Amsterdam, The Netherlands) spoke on ontology mapping and presented different approaches to ontology-mapping, covering linguistic, statistical and logical methods. Paul Lukowicz (University for Health Sciences, Medical Informatics and Technology, Hall in Tirol, Austria) introduced the topic of context-aware wearable systems with the focus on human computer interaction, and illustrated different ways forward within that research area. Two extended abstracts of these invited lectures are included in this volume.

An important new feature of the AIME conferences is the Doctoral Consortium (organized by Elpida Keravnou) held for the first time in the context of AIME. We would like to thank the eight students who presented their research work during the consortium and the participating faculty (Ameen Abu-Hanna, Riccardo Bellazzi, Carlo Combi, Michel Dojat, Peter Lucas, Silvana Quaglini, and Yuval Shahar) for their fruitful and constructive discussions and comments with the students.

AIME 2005 hosted two workshops: the Tenth IDAMAP Workshop on Intelligent Data Analysis in Medicine and Pharmacology and the Workshop on Biomedical Ontology Engineering. Four half-day tutorials were also offered: Evaluation of Prognostic Models; Evolutionary Computation Approaches to Mining Biomedical Data; Causal Discovery from Biomedical Data; and Applied Data Mining in Clinical Research.

We mourn the death of one of the members of the Program Committee – Barbara Heller died after a long illness during the reviewing process.

We would like to thank all the people and institutions who contributed to the success of the AIME 2005 conference: the authors, the members of the program committee as well as additional reviewers, all the members of the organizing committee, and the invited speakers Frank van Harmelen and Paul Lukowicz. Moreover, we would like to thank the organizers of the two workshops, John Holmes, Niels Peek, Jeremy Rogers, Alan Rector, and Robert Stevens and the presenters of the tutorials, Ameen Abu-Hanna, John Holmes, Subramani Mani, and Niels Peek. Finally, we would like to thank the University of Aberdeen for sponsoring and hosting the conference.

May 2005

Silvia Miksch
Jim Hunter
Elpida Keravnou

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Workshops

IDAMAP-2005: Intelligent Data Analysis in Medicine and Pharmacology

Co-chairs: John Holmes, School of Medicine, University of Pennsylvania, USA
Niels Peek, Academic Medical Center, University of Amsterdam, The Netherlands

Biomedical Ontology Engineering

Co-chairs: Jeremy Rogers, University of Manchester, United Kingdom
Alan Rector, University of Manchester, United Kingdom
Robert Stevens, University of Manchester, United Kingdom

Tutorials

Evaluation of Prognostic Models

Ameen Abu-Hanna and Niels Peek, Academic Medical Center, University of Amsterdam, The Netherlands

Evolutionary Computation Approaches to Mining Biomedical Data

John Holmes, School of Medicine, University of Pennsylvania, USA

Causal Discovery from Biomedical Data

Subramani Mani, Department of Electrical Engineering and Computer Science, University of Wisconsin-Milwaukee, USA

Applied Data Mining in Clinical Research

John Holmes, School of Medicine, University of Pennsylvania, USA

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