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Artificial Neural Networks in Medicine and Biology

Proceedings of the ANNIMAB-1 Conference, Göteborg, Sweden, 13-16 May 2000

Springer

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Preface

This book contains the proceedings of the conference ANNIMAB-1, held 13-16 May 2000 in Göteborg, Sweden. The conference was organized by the Society for Artificial Neural Networks in Medicine and Biology (ANNIMAB-S), which was established to promote research within a new and genuinely cross-disciplinary field. Forty-two contributions were accepted for presentation; in addition to these, 8 invited papers are also included.

Research within medicine and biology has often been characterised by application of statistical methods for evaluating domain specific data. The growing interest in Artificial Neural Networks has not only introduced new methods for data analysis, but also opened up for development of new models of biological and ecological systems. The ANNIMAB-1 conference is focusing on some of the many uses of artificial neural networks with relevance for medicine and biology, specifically:

- Medical applications of artificial neural networks: for better diagnoses and outcome predictions from clinical and laboratory data, in the processing of ECG and EEG signals, in medical image analysis, etc. More than half of the contributions address such clinically oriented issues.
- Uses of ANNs in biology outside clinical medicine: for example, in models of ecology and evolution, for data analysis in molecular biology, and (of course) in models of animal and human nervous systems and their capabilities.
- Theoretical aspects: recent developments in learning algorithms, ANNs in relation to expert systems and to traditional statistical procedures, hybrid systems and integrative approaches.

We would like to acknowledge the cooperation of a number of individuals and organisations, who have contributed to making the ANNIMAB conference and this publication possible.

- The Department of Philosophy, Göteborg University, has graciously accepted to take the financial risk for the entire project. The Foundation for Knowledge and Competence Development (KK-stiftelsen) is financially supporting both the ANNIMAB-S and the conference. Economic support for the conference has also been obtained from the Faculty of Arts, Göteborg University, and from the Swedish Council for Research in the Humanities and Social Sciences (HSFR).
- The organising committee has through numerous meetings made an invaluable effort to create an interesting and well-balanced program with several related topics, well covered by invited and submitted papers.
- We are of course indebted to the program committee and all the individual reviewers for guaranteeing the scientific quality of the conference.

- A special acknowledgement is in order to Daniel Ruhe for all his technical support, formatting checks and (maybe most noticeable) design of web pages and the cover of the proceedings. We also want to thank ARC Science Simulations for allowing us to use the copyrighted image of the earth on this cover.

We trust that readers interested in artificial neural networks, medicine or biology will find this book to be very exciting and of high quality.

Göteborg, February 4, 2000

Helge Malmgren
Magnus Borga
Lars Niklasson

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