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Neural Networks

EURASIP Workshop 1990

Sesimbra, Portugal, February 15–17, 1990

Proceedings



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Preface

This book contains both the full and the invited contributions to the 1990 EURASIP Workshop on Neural Networks, held in Sesimbra, Portugal, February 15-17, 1990. Though sponsored by a European organization (the European Association for Signal Processing, EURASIP), no restrictions were placed on the origin of the participants in this workshop. Instead, the selection of the full contributions was performed by an international Technical Committee. The quality demands that were imposed are reflected in the acceptance ratio, which was only about 40%.

The field of the contributions has not been restricted to an overspecialized topic: one main characteristic of the connectionist community is its multidisciplinary nature. Psychologists may identify the essential features of the world to be learned and propose original learning schemes, biologists can describe architectures that have not been studied previously by computer scientists, and engineers may perform simulations and implementations of connectionist architectures, while the help of mathematicians is most welcome to formalize these nonlinear models suggested by nature. Authors of this book belong to all these disciplines.

The two invited papers, by George Cybenko and by Eric Baum, deserve a special mention. They deal with two different aspects of a subject which we consider very important for the consolidation of the field: the formal study of the capabilities of neural networks. George Cybenko introduces the definition of a formal measure of problem complexity which is relevant to neural networks and discusses some of its properties. Eric Baum studies the relationships between training set size, network size and generalization capability. We can only hope that these will form the embryo of a body of theory that will allow neural network problems to be approached with an engineering methodology, instead of the present trial-and-error manner.

Besides the published papers, about 20 posters were displayed at the workshop; they allowed their authors to present their current research effort but they were not included in this publication due to their inherent incompleteness.

It is our pleasure to thank all the authors who coped with the strictly imposed deadlines for supplying their camera ready manuscripts. Their cooperation and good will were rewarded by allowing Springer-Verlag to have the proceedings available for the participants at the workshop.

The original Technical Committee, which had 8 members, was greatly enlarged to allow a more complete review of the submitted papers. We wish to thank all its members. The free cooperation of reviewers is an essential part of research.

We also wish to acknowledge the cooperation given by Joaquim Rodrigues and Fernando Silva. A very special acknowledgment goes to Ilda Gonçalves, who provided invaluable help in every aspect of the preparation of this volume and of the workshop itself, always with a smile. Acknowledgments to INESC, Philips Research Laboratory Brussels and Bell Communications Research are also due, for providing most of the resources needed for this kind of organization.

Lisbon, November 1989

Luis B. Almeida

Morristown, November 1989

Christian J. Wellekens

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