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Jörg Siekmann
Institut für Informatik, Universität Kaiserslautern
Postfach 3049, W-6750 Kaiserslautern, FRG

Volume Editors

J. D. Becker*
I. Eisele
Institut für Physik, Fakultät für Elektrotechnik, Universität der Bundeswehr
Werner-Heisenberg-Weg 39, W-8014 Neubiberg, FRG

F. W. Mündemann*
Fakultät für Informatik, Universität der Bundeswehr
Werner-Heisenberg-Weg 39, W-8014 Neubiberg, FRG

* Also at:
ICAS, Institute for Cypernetic Anthropology Starnberg
Maisingerschluchtstraße 4a, W-8130 Starnberg, FRG

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Preface

Parallel and distributed processing raises many new questions which did not play a role in the classical von Neumann pradigm. Thus, as in two preceding volumes[+], also here we try to explore other areas which may be important for parallel processing, in addition to presenting material directly concerned with the field.

In search of such relevant concepts, we have included papers on aspects of
- space and time,
- representations of systems,
- non-Boolean logics,
- metrics,
- dynamics and structure, and
- superposition and uncertainties.

In particular we should like to point out that distributed representations of information may share many features with quantum physics, such as the superposition principle and the uncertainty relations. Another important issue is logics; if Boolean logic has not developed as a natural ability of the human race in the course of evolution, this might mean that there should be an advantage in using protologics for problem solving. The reason for this could be that Boolean logic is too rigid for situations in which information is not conserved.

The central part of this volume contains material on general parallel processing machines, neural networks, and system-theoretic aspects.

We have added to the papers presented at WOPPLOT 89 the material of another workshop on Evolutionary Strategies, because we feel that these will yield very powerful and important applications for parallel processing machines, and because this section represents a kind of completion of this volume. Furthermore, evolutionary and genetic algorithms not only speed up considerably the search for suboptimal solutions to hard problems; it seems that they also open the pathway to new problem classes to be treated by computers.

[+] WOPPLOT 83, Springer Lecture Notes in Physics, Vol. 196

WOPPLOT 86, Springer Lecture Notes in Computer Science, Vol. 253

For technical and personal reasons it has not been easy to edit and complete this volume, and we apologize very much to the authors as well as to the publishing company for the delay.

It is a pleasure to thank the publisher, Springer-Verlag, for giving us again the opportunity to present this collection of papers to the scientific community.

Neubiberg, Summer 1991 J. Becker, I. Eisele, F. Mündemann

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[+] *Reprinted from: Peter J. Plath (ed.): Optimal Structures in Heterogeneous Reaction Systems Springer Series in Synergetics (1989)*