Parallelism, Learning, Evolution

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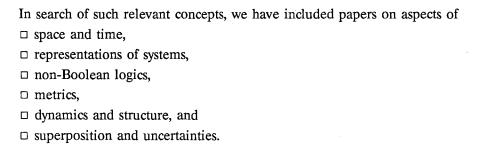
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Preface

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 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

Contents

On Parallel Consciousness
Complementarity and Non-locality in Complex Systems
Systems and Uncertainty
The Construction of Space and the Logics of Quantum Mechanics 67 P. Quadranti
Cellular Automata and the Concept of Space
Multipurpose and Special Purpose Computers
Implementation of Divide-and-Conquer Algorithms on Multiprocessors 121 R. Knecht
Some Remarks on Synchronization Problems
Effective Implementation of Distributed Arbitration in Multiprocessor Systems . 148 M. Makhaniok, V. Cherniavsky, R. Männer, O. Stucky
Flowshop and Travelling Salesman Problem
Architectural Considerations for NERV - a General Purpose Neural Network Simulation System
Associative Neural Networks in Analog VLSI: Advantages of Decrementing Algorithms
Connectionist Models of Utterance Production
Self-Organization of Informational Systems
Distributed Semantic Representations of Word Meanings
Logic of Cognitive Representations and Their Evolution

A Modal Propositional Calculus for Quantum Facts and Dynamical Theories . 304 H. Atmanspacher, F. R. Krueger, H. Scheingraber
Self-Organization in Computational Systems
Adaptation and Extension: Learning in Rigid Systems
Chaotic Dynamics of Generating Markov Partitions, and Linguistic Sequences Mimicking Zipf's Law
Optimization and Complexity in Molecular Biology and Physics +)
Understanding Evolution as a Collective Strategy for Groping in the Dark 388 H. P. Schwefel
Parallel Genetic Algorithms, Population Genetics, and Combinatorial Optimization
ASPARAGOS, A Parallel Genetic Algorithm and Population Genetics 40' M. Gorges-Schleuter
Evolution: Travelling in an Imaginary Landscape
Finding the Global Minimum of a Low-Dimensional Spin-Glass Model 44: W. Banzhaf
Ten Theses Regarding the Design of Controlled Evolutionary Strategies 45 P. Ablay
Incommensurability of Liouvillean Dynamics and Information Dynamics 48 H. Atmanspacher
Selforganization by Evolutionary Strategies in Visual Systems 50 R. Lohmann
On Steiner Trees and Genetic Algorithms

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