

Robert John · Ralph Birkenhead (Eds.)

Soft Computing Techniques and Applications

With 98 Figures
and 38 Tables

Physica-Verlag

A Springer-Verlag Company

Contents

Preface	v
Part 1 Artificial Neural Networks	1
Towards Intelligent Mobile Robots <i>C.A.Czarnecki</i>	3
Wavelet Transform by Soft Computing <i>O.Ciftcioglu</i>	16
Investigating the Performance of MLP Classifiers Where Limited Training Data Are Available for Some Classes <i>C.R.Parikh, M.J.Pont, Y.Li and N.B.Jones</i>	22
A Neural Network Model for Projection Pursuit <i>R.Thawonmas</i>	28
Comparing the Performance of Three Neural Classifiers for Use in Embedded Applications <i>Y.Li, M.J.Pont, C.R.Parikh and N.B.Jones</i>	34
On the Application of Self-Organising Maps to the Exploration of Product Performance Measures <i>S.J.Wooding</i>	40
Using a Combination of RBFN, MLP and kNN Classifiers for Engine Misfire Detection <i>Y.Li, M.J.Pont, C.R.Parikh and N.B.Jones</i>	46

Chaos as a Desirable Stable State of Artificial Neural Networks <i>N.Crook, C.Dobbyn and T. olde Scheper</i>	52
Part 2 Hybrid Systems	61
A Framework for the Development of Hybrid AI Control Systems <i>A.R.Graves and C.A.Czarnecki</i>	63
Soft-computing Based Predictive Modelling of Building Management Systems <i>A.Gegov, G.S.Virk, D.Azzi, B.P.Haynes and K.I.Alkadhimi</i>	69
A Hybrid Evolutionary Approach to Best Basis Discrimination <i>A.R.Ferreira da Silva</i>	78
Comparing GA and NN Classification Methods <i>O.Babka, L.S.Io, C.Lei and P.M.Wa</i>	84
Part 3 Evolutionary Computing	91
Partially Randomised Crossover Operators <i>J.Kubalík and J.Lažanský</i>	93
The Dynamic Setting of Genetic Algorithm Parameters <i>C.Bowerman and C.-F. Tsai</i>	99
Job Shop Scheduling with Transfer Batches <i>J.Dvořák, M.Šeda and T. Vláčil</i>	105
Symbolic and Numerical Regression: A Hybrid Technique for Polynomial Approximators <i>J.W.Davidson, D.Savic and G.A.Walters</i>	111
Computational Optimisation of Cancer Chemotherapies Using Genetic Algorithms <i>A.Petrovski and J.McCall</i>	117

A Visual Development Environment for Coevolving Agent Behaviour <i>I.J.Griffiths, Q.H.Mehdi and N.E.Gough</i>	123
An Overview of an Evolutionary Algorithm Pattern Language <i>C.P.Wong and M.J.Pont</i>	129
Improvement of Decoding Schemas of Genetic Programming for Function Identification <i>L.Sláma and M.Balátě</i>	135
Memory-Based Heuristic Search and Optimal Structural Design <i>J.A.Bland</i>	141
Co-evolutionary Agents for Telecommunication Network Restoration <i>S.H.Shami and M.C.Sinclair</i>	146
Mutation Genes in Dynamic Environments <i>T.Watson and P.Messer</i>	152
Genetic Operators for Test Pattern Generation in Programmable Logic Arrays <i>A.Cruz and S.Mukherjee</i>	158
Controlling Code Growth in Genetic Programming <i>P.W.H.Smith</i>	166
The Effect of Clustering and Local Search on Genetic Algorithms <i>S.Areibi</i>	172
Visualisation of Non-Ordinal Multi-Dimensional Landscapes <i>M.Oates, D.Corne and R.Loader</i>	178
Learning Rule Design by Genetic Programming for a Discrete Stochastic Learning Automata <i>M.N.Howell</i>	186
A Task-Driven Genetic Algorithm for Maximizing Task Reliability in Multi-Sensor Systems <i>O.A.Basir</i>	192

Part 4 Fuzzy Systems	199
On Bags and Fuzzy Bags <i>K.Chakrabarty</i>	201
Fuzzy Decision Fusion for Automatic Scene Analysis in a Command and Control System <i>W.Mees</i>	213
Robustness Study of an On-line Application of a Self-Learning Fuzzy Logic Controller <i>S.H.Gwanmeh, K.O.Jones and D.Williams</i>	219
Efficient Tracking of Coloured Objects Using Fuzzy-Tuned Scanpaths <i>M.J.Allen, I.J.Griffiths, I.M.Coulson, Q.H.Mehdi and N.E.Gough</i>	225
Steelmaking Process Evaluation Using a Fuzzy Expert System <i>L.Collantes, R.Roy and J.Madill</i>	231
Fuzzy Decision Aid in Multiple Objective Linear Programming <i>A.R.P. Borges and C.H.Antunes</i>	238
Indirect Learning Fuzzy Controllers <i>A.Lotfi and J.B.Hull</i>	244
Fuzzy Logic Based Collision Avoidance Algorithm for a Mobile Robot <i>C.Fayad and P.Webb</i>	250
Collaborative Decision Making in Construction - Potential Application Area for Fuzzy Systems? <i>H.M.Yang and C.J.Anumba</i>	258