

# Table of Contents, Part II

## Bio-inspired Systems and Engineering

From Embryonics to POEtic Machines . . . . .	1
<i>D. Mange, A. Stauffer, G. Tempesti, and C. Teuscher</i>	
Design and Codesign of Neuro-Fuzzy Hardware . . . . .	14
<i>L.M. Reyneri</i>	
A Field-Programmable Conductance Array IC for Biological Neurons Modeling . . . . .	31
<i>V. Douence, S. Renaud-Le Masson, S. Saïghi, and G. Le Masson</i>	
A 2-by-n Hybrid Cellular Automaton Implementation Using a Bio-Inspired FPGA . . . . .	39
<i>H.F. Restrepo and D. Mange</i>	
Parametric Neurocontroller for Positioning of an Anthropomorphic Finger Based on an Oponent Driven-Tendon Transmission System . . . . .	47
<i>J.I. Mulero, J. Feliú Batlle, and J. López Coronado</i>	
An Integration Principle for Multimodal Sensor Data Based on Temporal Coherence of Self-Organized Patterns. . . . .	55
<i>E.I. Barakova</i>	
Simultaneous Parallel Processing of Object and Position by Temporal Correlation . . . . .	64
<i>L.F. Lago-Fernández and G. Deco</i>	

## Methodology for Nets Design, Nets Simulation and Implementation

NeuSim: A Modular Neural Networks Simulator for Beowulf Clusters . . . . .	72
<i>C.J. García Orellana, R. Gallardo Caballero, H.M. González Velasco, F.J. López Aligué</i>	
Curved Kernel Neural Network for Functions Approximation . . . . .	80
<i>P. Bourret and B. Pelletier</i>	
Repeated Measures Multiple Comparison Procedures Applied to Model Selection in Neural Networks . . . . .	88
<i>E. Guerrero Vázquez, A. Yañez Escolano, P. Galindo Riaño, J. Pizarro Junquera</i>	

XII Table of Contents, Part II

Extension of HUMANN for Dealing with Noise and with Classes of Different Shape and Size: A Parametric Study . . . . .	96
<i>P. García Báez, C.P. Suárez Araujo, and P. Fernández López</i>	
Evenet 2000: Designing and Training Arbitrary Neural Networks in Java . .	104
<i>E.J. González, A.F. Hamilton, L. Moreno, J.F. Sigut, and R.L. Marichal</i>	
Neyman-Pearson Neural Detectors . . . . .	111
<i>D. Andina and J.L. Sanz-González</i>	
Distance between Kohonen Classes Visualization Tool to Use SOM in Data Set Analysis and Representation . . . . .	119
<i>P. Rousset and C. Guinot</i>	
Optimal Genetic Representation of Complete Strictly-Layered Feedforward Neural Networks . . . . .	127
<i>S. Raptis, S. Tzafestas, and H. Karagianni</i>	
Assessing the Noise Immunity of Radial Basis Function Neural Networks . .	136
<i>J.L. Bernier, J. González, A. Cañas, and J. Ortega</i>	
Analyzing Boltzmann Machine Parameters for Fast Convergence . . . . .	144
<i>F.J. Salcedo, J. Ortega, and A. Prieto</i>	
A Penalization Criterion Based on Noise Behaviour for Model Selection . .	152
<i>J. Pizarro Junquera, P. Galindo Riaño, E. Guerrero Vázquez, and A. Yañez Escolano</i>	

## Image Processing

Wood Texture Analysis by Combining the Connected Elements Histogram and Artificial Neural Networks . . . . .	160
<i>M.A. Patricio Guisado and D. Maravall Gómez-Allende</i>	
Dynamic Topology Networks for Colour Image Compression . . . . .	168
<i>E. López-Rubio, J. Muñoz-Pérez, and J.A. Gómez-Ruiz</i>	
Analysis on the Viewpoint Dependency in 3-D Object Recognition by Support Vector Machines . . . . .	176
<i>T. Hayasaka, E. Ohnishi, S. Nakauchi, and S. Usui</i>	
A Comparative Study of Two Neural Models for Cloud Screening of Iberian Peninsula Meteosat Images . . . . .	184
<i>M. Macías Macías, F.J. López Aliqué, A. Serrano Pérez, and A. Astilleros Vivas</i>	

A Growing Cell Neural Network Structure for Off-Line Signature Recognition .....	192
<i>K. Toscano-Medina, G. Sanchez-Perez, M. Nakano-Miyatake, and H. Perez-Meana</i>	
ZISC-036 Neuro-processor Based Image Processing .....	200
<i>K. Madani, G. de Trémiolles, and P. Tannhof</i>	
Self-Organizing Map for Hyperspectral Image Analysis.....	208
<i>P. Martínez, P.L. Aguilar, R.M. Pérez, M. Linaje, J.C. Preciado, and A. Plaza</i>	
Classification of the Images of Gene Expression Patterns Using Neural Networks Based on Multi-valued Neurons .....	219
<i>I. Aizenberg, E. Myasnikova, and M. Samsonova</i>	
Image Restoration Using Neural Networks .....	227
<i>S. Ghennam and K. Benmahammed</i>	
Automatic Generation of Digital Filters by NN Based Learning: An Application on Paper Pulp Inspection .....	235
<i>P. Campoy-Cervera, D.F. Muñoz García, D. Peña, and J.A. Calderón-Martínez</i>	
Image Quality Enhancement for Liquid Bridge Parameter Estimation with DTCNN.....	246
<i>M.A. Jaramillo, J. Álvaro Fernández, J.M. Montanero, and F. Zayas</i>	
Neural Network Based on Multi-valued Neurons: Application in Image Recognition, Type of Blur and Blur Parameters Identification ..	254
<i>I. Aizenberg, N. Aizenberg, and C. Butakoff</i>	
Analyzing Wavelets Components to Perform Face Recognition .....	262
<i>P. Isasi, M. Velasco, and J. Segovia</i>	
Man-Machine Voice Interface Using a Commercially Available Neural Chip .....	271
<i>N.J. Medraño-Marqués and B. Martín-del-Brío</i>	
Partial Classification in Speech Recognition Verification.....	279
<i>G. Hernández Ábrego and I. Torres Sánchez</i>	
Speaker Recognition Using Gaussian Mixtures Model .....	287
<i>E. Simancas-Acevedo, A. Kurematsu, M. Nakano Miyatake, and H. Perez-Meana</i>	
A Comparative Study of ICA Filter Structures Learnt from Natural and Urban Images .....	295
<i>C. Ziegeus and E.W. Lang</i>	

XIV     Table of Contents, Part II

Neural Edge Detector –  
A Good Mimic of Conventional One Yet Robuster against Noise ..... 303  
*K. Suzuki, I. Horiba, and N. Sugie*

Neural Networks for Image Restoration from the Magnitude  
of Its Fourier Transform ..... 311  
*A. Burian, J. Saarinen, and P. Kuosmanen*

**Medical Applications**

An Automatic System for the Location of the Optic Nerve Head  
from 2D Images..... 319  
*M. Bachiller, M. Rincón, J. Mira, and J. García-Feijó*

Can ICA Help Classify Skin Cancer and Benign Lesions?..... 328  
*C. Mies, C. Bauer, G. Ackermann, W. Bäumlér, C. Abels,  
C.G. Puntonet, M. Rodríguez-Alvarez, and E.W. Lang*

An Approach Fractal and Analysis of Variogram for Edge Detection  
of Biomedical Images ..... 336  
*L. Hamami and N. Lassouaoui*

Some Examples for Solving Clinical Problems Using Neural Networks. .... 345  
*A.J. Serrano, E. Soria, G. Camps, J.D. Martín, and N.V. Jiménez*

Medical Images Analysis: An Application of Artificial Neural Networks  
in the Diagnosis of Human Tissues ..... 353  
*E. Restum Antonio, L. Biondi Neto, V. De Roberto Junior,  
and F. Hideo Fukuda*

Feature Selection, Ranking of Each Feature and Classification  
for the Diagnosis of Community Acquired Legionella Pneumonia ..... 361  
*E. Monte, J. Solé i Casals, J.A. Fiz, and N. Sopena*

Rotation-Invariant Image Association for Endoscopic Positional  
Identification Using Complex-Valued Associative Memories ..... 369  
*H. Aoki, E. Watanabe, A. Nagata, and Y. Kosugi*

A Multi Layer Perceptron Approach for Predicting and Modeling  
the Dynamical Behavior of Cardiac Ventricular Repolarisation ..... 377  
*R. El Dajani, M. Miquel, and P. Rubel*

Detection of Microcalcifications in Mammograms by the Combination  
of a Neural Detector and Multiscale Feature Enhancement ..... 385  
*D. Andina and A. Vega-Corona*

An Auto-learning System for the Classification of Fetal Heart Rate Decelerative Patterns .....	393
<i>B. Guijarro Berdiñas, A. Alonso-Betanzos, O. Fontenla-Romero, O. García-Dans, and N. Sánchez Maroño</i>	

Neuro-Fuzzy Nets in Medical Diagnosis: The DIAGEN Case Study of Glaucoma .....	401
<i>E. Carmona, J. Mira, J. García Feijó, and M.G. de la Rosa</i>	

## Robotics

Evolving Brain Structures for Robot Control .....	410
<i>F. Pasemann, U. Steinmetz, M. Hülse, and B. Lara</i>	

A Cuneate-Based Network and Its Application as a Spatio-Temporal Filter in Mobile Robotics .....	418
<i>E. Sánchez, M. Mucientes, and S. Barro</i>	

An Application of Fuzzy State Automata: Motion Control of an Hexapod Walking Machine .....	426
<i>D. Morano and L.M. Reyneri</i>	

Neural Adaptive Force Control for Compliant Robots .....	436
<i>N. Saadia, Y. Amirat, J. Pontnaut, and A. Ramdane-Cherif</i>	

Reactive Navigation Using Reinforcement Learning Techniques in Situations of POMDPs .....	444
<i>P. Puliti, G. Tascini, and A. Montesanto</i>	

Landmark Recognition for Autonomous Navigation Using Odometric Information and a Network of Perceptrons .....	451
<i>J. de Lope Asiaín and D. Maravall Gómez-Allende</i>	

Topological Maps for Robot's Navigation: A Conceptual Approach .....	459
<i>F. de la Paz López, and J.R. Álvarez-Sánchez</i>	

Information Integration for Robot Learning Using Neural Fuzzy Systems ..	468
<i>C. Zhou, Y. Yang, and J. Kanniah</i>	

Incorporating Perception-Based Information in Reinforcement Learning Using Computing with Words .....	476
<i>C. Zhou, Y. Yang, and X. Jia</i>	

Cellular Neural Networks for Mobile Robot Vision .....	484
<i>M. Balsi, A. Maraschini, G. Apicella, S. Luengo, J. Solsona, and X. Vilasís-Cardona</i>	

Learning to Predict Variable-Delay Rewards and Its Role in Autonomous Developmental Robotics .....	492
<i>A. Pérez-Urbe and M. Courant</i>	

XVI Table of Contents, Part II

Robust Chromatic Identification and Tracking .....	500
<i>J. Ramírez and G. Grittani</i>	
Sequence Learning in Mobile Robots Using Avalanche Neural Networks ...	508
<i>G. Quero and C. Chang</i>	
Investigating Active Pattern Recognition in an Imitative Game .....	516
<i>S. Moga, P. Gaussier, and M. Quoy</i>	
Towards an On-Line Neural Conditioning Model for Mobile Robots .....	524
<i>E. Şahin</i>	

## General Applications

A Thermocouple Model Based on Neural Networks .....	531
<i>N. Medraño-Marqués, R. del-Hoyo-Alonso, and B. Martín-del-Brío</i>	
Improving Biological Sequence Property Distances Using a Genetic Algorithm .....	539
<i>O.M. Perez, F.J. Marin, and O. Trelles</i>	
Data Mining Applied to Irrigation Water Management .....	547
<i>J.A. Botía, A.F. Gómez Skarmeta, M. Valdés, and A. Padilla</i>	
Classification of Specular Object Based on Statistical Learning Theory ...	555
<i>T.S. Yun</i>	
On the Application of Heteroassociative Morphological Memories to Face Localization .....	563
<i>B. Raducanu and M. Graña</i>	
Early Detection and Diagnosis of Faults in an AC Motor Using Neuro Fuzzy Techniques: FasArt+ Fuzzy k Nearest Neighbors .....	571
<i>J. Juez, G.I. Sainz, E.J. Moya, and J.R. Perán</i>	
Knowledge-Based Neural Networks for Modelling Time Series .....	579
<i>J. van Zyl and C.W. Omlin</i>	
Using Artificial Neural Network to Define Fuzzy Comparators in FSQl with the Criterion of Some Decision-Maker .....	587
<i>R. Carrasco, J. Galindo, and A. Vila</i>	
Predictive Classification for Integrated Pest Management by Clustering in NN Output Space .....	595
<i>M. Salmerón, D. Guidotti, R. Petacchi, and L.M. Reyneri</i>	
Blind Source Separation in the Frequency Domain: A Novel Solution to the Amplitude and the Permutation Indeterminacies .....	603
<i>A. Dapena and L. Castedo</i>	

Evaluation, Classification and Clustering with Neuro-Fuzzy Techniques in Integrate Pest Management .....	611
<i>E. Bellei, D. Guidotti, R. Petacchi, L.M. Reyneri, and I. Rizzi</i>	
Inaccessible Parameters Monitoring in Industrial Environment: A Neural Based Approach.....	619
<i>K. Madani and I. Berechet</i>	
Autoorganized Structures for Extraction of Perceptual Primitives .....	628
<i>M. Penas, M.J. Carreira, and M.G. Penedo</i>	
Real-Time Wavelet Transform for Image Processing on the Cellular Neural Network Universal Machine .....	636
<i>V.M. Preciado</i>	
OBLIC: Classification System Using Evolutionary Algorithm .....	644
<i>J.L. Alvarez, J. Mata, and J.C. Riquelme</i>	
Design of a Pre-processing Stage for Avoiding the Dependence on TSNR of a Neural Radar Detector.....	652
<i>P. Jarabo Amores, M. Rosa Zurera, and F. López Ferreras</i>	
Foetal Age and Weight Determination Using a Lateral Interaction Inspired Net .....	660
<i>A. Fernández-Caballero, J. Mira, F.J. Gómez, and M.A. Fernández</i>	
Inference of Stochastic Regular Languages through Simple Recurrent Networks with Time Dealys.....	671
<i>G.A. Casañ and M.A. Castaño</i>	
Is Neural Network a Reliable Forecaster on Earth? A MARS Query! .....	679
<i>A. Abraham and D. Steinberg</i>	
Character Feature Extraction Using Polygonal Projection Sweep (Contour Detection) .....	687
<i>R.J. Rodrigues, G.K. Vianna, and A.C.G. Thomé</i>	
Using Contextual Information to Selectively Adjust Preprocessing Parameters .....	696
<i>P. Neskovic and L.N. Cooper</i>	
Electric Power System's Stability Assessment and Online-Provision of Control Actions Using Self-Organizing Maps .....	704
<i>C. Leder and C. Rehtanz</i>	
Neural Networks for Contingency Evaluation and Monitoring in Power Systems .....	711
<i>F. García-Lagos, G. Joya, F.J. Marín, and F. Sandoval</i>	

XVIII Table of Contents, Part II

Hybrid Framework for Neuro-dynamic Programming Application to Water Supply Networks .....	719
<i>M. Damas, M. Salmerón, J. Ortega, and G. Olivares</i>	
Classification of Disturbances in Electrical Signals Using Neural Networks .....	728
<i>C. León, A. López, J.C. Montaña, and Í. Monedero</i>	
Neural Classification and “Traditional” Data Analysis: An Application to Households’ Living Conditions .....	738
<i>S. Ponthieux and M. Cottrell</i>	
Nonlinear Synthesis of Vowels in the LP Residual Domain with a Regularized RBF Network .....	746
<i>E. Rank and G. Kubin</i>	
Nonlinear Vectorial Prediction with Neural Nets .....	754
<i>M. Faúndez-Zanuy</i>	
Separation of Sources Based on the Partitioning of the Space of Observations .....	762
<i>M. Rodríguez-Álvarez, C.G. Puntonet, and I. Rojas</i>	
Adaptive ICA with Order Statistics in Multidimensional Scenarios .....	770
<i>Y. Blanco, S. Zazo, and J.M. Paez-Borralló</i>	
Pattern Repulsion Revisited .....	778
<i>Fabian J. Theis, C. Bauer, C. Puntonet, and E.W. Lang</i>	
The Minimum Entropy and Cumulants Based Contrast Functions for Blind Source Extraction .....	786
<i>S. Cruces, A. Cichocki, and S.-I. Amari</i>	
Feature Extraction in Digital Mammography: An Independent Component Analysis Approach .....	794
<i>A. Koutras, I. Christoyianni, E. Dermatas, and G. Kokkinakis</i>	
Blind Source Separation in Convolutional Mixtures: A Hybrid Approach for Colored Sources .....	802
<i>F. Abrard and Y. Deville</i>	
A Conjugate Gradient Method and Simulated Annealing for Blind Separation of Sources .....	810
<i>R. Martín-Clemente, C.G. Puntonet, and J.I. Acha</i>	
The Problem of Overlearning in High-Order ICA Approaches: Analysis and Solutions .....	818
<i>J. Särelä and R. Vigário</i>	

Equi-convergence Algorithm for Blind Separation of Sources with Arbitrary Distributions .....	826
<i>L.-Q. Zhang, S. Amari, and A. Cichocki</i>	
Separating Convolutional Mixtures by Mutual Information Minimization....	834
<i>M. Babaie-Zadeh, C. Jutten, and K. Navehi</i>	
<b>Author Index</b> .....	843

# Table of Contents, Part I

## Foundations of Connectionism and Biophysical Models of Neurons

Dendrites: The Last-Generation Computers .....	1
<i>O. Herreras, J.M. Ibarz, L. López-Aguado, and P. Varona</i>	
Homogeneity in the Electrical Activity Pattern as a Function of Intercellular Coupling in Cell Networks .....	14
<i>E. Andreu, R. Pomares, B. Soria, and J.V. Sanchez-Andres</i>	
A Realistic Computational Model of the Local Circuitry of the Cuneate Nucleus .....	21
<i>E. Sánchez, S. Barro, J. Mariño, and A. Canedo</i>	
Algorithmic Extraction of Morphological Statistics from Electronic Archives of Neuroanatomy .....	30
<i>R. Scorcioni and G.A. Ascoli</i>	
What Can We Compute with Lateral Inhibition Circuits? .....	38
<i>J. Mira and A.E. Delgado</i>	
Neuronal Models with Current Inputs .....	47
<i>J. Feng</i>	
Decoding the Population Responses of Retinal Ganglions Cells Using Information Theory .....	55
<i>J.M. Ferrández, M. Bongard, F. García de Quirós, J.A. Bolea, J. Ammermüller, R.A. Normann, and E. Fernández</i>	
Numerical Study of Effects of Co-transmission by Substance P and Acetylcholine on Synaptic Plasticity in Myenteric Neurons .....	63
<i>R. Miftakov and J. Christensen</i>	
Neurobiological Modeling of Bursting Response During Visual Attention ..	72
<i>R. Rajimehr and L. Montaser Kouhsari</i>	
Sensitivity of Simulated Striate Neurons to Cross-Like Stimuli Based on Disinhibitory Mechanism .....	81
<i>K.A. Saltykov and I.A. Shevelev</i>	
Synchronisation Mechanisms in Neuronal Networks .....	87
<i>S. Chillemi, M. Barbi, and A. Di Garbo</i>	

Detection of Oriented Repetitive Alternating Patterns in Color Images (A Computational Model of Monkey Grating Cells) .....	95
<i>T. Lourens, H.G. Okuno, and H. Kitano</i>	
Synchronization in Brain – Assessment by Electroencephalographic Signals	108
<i>E. Pereda and J. Bhattacharya</i>	
Strategies for the Optimization of Large Scale Networks of Integrate and Fire Neurons .....	117
<i>M.A. Sánchez-Montañés</i>	

## Structural and Functional Models of Neurons

A Neural Network Model of Working Memory (Processing of “What” and “Where” Information) .....	126
<i>T. Minami and T. Inui</i>	
Orientation Selectivity of Intracortical Inhibitory Cells in the Striate Visual Cortex: A Computational Theory and a Neural Circuitry .....	134
<i>M.N. Shirazi</i>	
Interpreting Neural Networks in the Frame of the Logic of Lukasiewicz ...	142
<i>C. Moraga and L. Salinas</i>	
Time-Dispersive Effects in the J. Gonzalo’s Research on Cerebral Dynamics .....	150
<i>I. Gonzalo and M.A. Porras</i>	
Verifying Properties of Neural Networks .....	158
<i>P. Rodrigues, J.F. Costa, and H.T. Siegelmann</i>	
Algorithms and Implementation Architectures for Hebbian Neural Networks .....	166
<i>J.A. Berzal and P.J. Zufiria</i>	
The Hierarchical Neuro-Fuzzy BSP Model: An Application in Electric Load Forecasting .....	174
<i>F.J. de Souza, M.M.R. Vellasco, and M.A.C. Pacheco</i>	
The Chemical Metaphor in Neural Computation .....	184
<i>J. Barahona da Fonseca, I. Barahona da Fonseca, C.P. Suárez Araujo, and J. Simões da Fonseca</i>	
The General Neural-Network Paradigm for Visual Cryptography .....	196
<i>T.-W. Yue and S. Chiang</i>	

XXII Table of Contents, Part I

II-DTB, Discrete Time Backpropagation with Product Units .....	207
<i>J. Santos and R.J. Duro</i>	
Neocognitron-Type Network for Recognizing Rotated and Shifted Patterns with Reduction of Resources .....	215
<i>S. Satoh, S. Miyake, and H. Aso</i>	
Classification with Synaptic Radial Basis Units .....	223
<i>J.D. Buldain</i>	
A Randomized Hypercolumn Model and Gesture Recognition.....	235
<i>N. Tsuruta, Y. Yoshiki, and T. El. Tobely</i>	
Heterogeneous Kohonen Networks.....	243
<i>S. Negri, L.A. Belanche</i>	
Divided-Data Analysis in a Financial Case Classification with Multi-dendritic Neural Networks .....	253
<i>J.D. Buldain</i>	
Neuro Fuzzy Systems: State-of-the-Art Modeling Techniques .....	269
<i>A. Abraham</i>	
Generating Linear Regression Rules from Neural Networks Using Local Least Squares Approximation.....	277
<i>R. Setiono</i>	
Speech Recognition Using Fuzzy Second-Order Recurrent Neural Networks.....	285
<i>A. Blanco, M. Delgado, M.C. Pegalajar, and I. Requena</i>	
A Measure of Noise Immunity for Functional Networks .....	293
<i>E. Castillo, O. Fontenla-Romero, B. Guijarro-Berdiñas, and A. Alonso-Betanzos</i>	
A Functional-Neural Network for Post-Nonlinear Independent Component Analysis .....	301
<i>O. Fontenla Romero, B. Guijarro Berdiñas, and A. Alonso Betanzos</i>	
Optimal Modular Feedforward Neural Nets Based on Functional Network Architectures .....	308
<i>A.S. Cofíño, J.M. Gutiérrez</i>	
Optimal Transformations in Multiple Linear Regression Using Functional Networks .....	316
<i>E. Castillo, A.S. Hadi, and B. Lacruz</i>	

## Learning and Other Plasticity Phenomena, and Complex Systems Dynamics

Generalization Error and Training Error at Singularities of Multilayer Perceptrons .....	325
<i>S.-I. Amari, T. Ozeki, and H. Park</i>	
Bistable Gradient Neural Networks: Their Computational Properties .....	333
<i>V. Chinarov and M. Menzinger</i>	
Inductive Bias in Recurrent Neural Networks .....	339
<i>S. Snyders and C.W. Omlin</i>	
Accelerating the Convergence of EM-Based Training Algorithms for RBF Networks .....	347
<i>M. Lázaro, I. Santamaría, and C. Pantaleón</i>	
Expansive and Competitive Neural Networks .....	355
<i>J.A. Gomez-Ruiz, J. Muñoz-Perez, E. Lopez-Rubio, and M.A. Garcia-Bernal</i>	
Fast Function Approximation with Hierarchical Neural Networks and Their Application to a Reinforcement Learning Agent .....	363
<i>J. Fischer, R. Breithaupt, and M. Bode</i>	
Two Dimensional Evaluation Reinforcement Learning.....	370
<i>H. Okada, H. Yamakawa, and T. Omori</i>	
Comparing the Learning Processes of Cognitive Distance Learning and Search Based Agent .....	378
<i>H. Yamakawa, Y. Miyamoto, and H. Okada</i>	
Selective Learning for Multilayer Feedforward Neural Networks .....	386
<i>A.P. Engelbrecht</i>	
Connectionist Models of Cortico-Basal Ganglia Adaptive Neural Networks During Learning of Motor Sequential Procedures .....	394
<i>J. Molina Vilaplana, J. Feliú Batlle, and J. López Coronado</i>	
Practical Consideration on Generalization Property of Natural Gradient Learning.....	402
<i>H. Park</i>	
Novel Training Algorithm Based on Quadratic Optimisation Using Neural Networks .....	410
<i>G. Arulampalam and A. Bouzerdoun</i>	
Non-symmetric Support Vector Machines .....	418
<i>J. Feng</i>	

XXIV Table of Contents, Part I

Natural Gradient Learning in NLDA Networks .....	427
<i>J.R. Dorronsoro, A. González, and C. Santa Cruz</i>	
AUTOWISARD: Unsupervised Modes for the WISARD .....	435
<i>I. Wickert and F.M.G. França</i>	
Neural Steering: Difficult and Impossible Sequential Problems for Gradient Descent .....	442
<i>G. Milligan, M.K. Weir, and J.P. Lewis</i>	
Analysis of Scaling Exponents of Waken and Sleeping Stage in EEG .....	450
<i>J.-M. Lee, D.-J. Kim, I.-Y. Kim, and S.I. Kim</i>	
Model Based Predictive Control Using Genetic Algorithms. Application to Greenhouses Climate Control. ....	457
<i>X. Blasco, M. Martínez, J. Senent, and J. Sanchis</i>	
Nonlinear Parametric Model Identification with Genetic Algorithms. Application to a Thermal Process. ....	466
<i>X. Blasco, J.M. Herrero, M. Martínez, and J. Senent</i>	
A Comparison of Several Evolutionary Heuristics for the Frequency Assignment Problem .....	474
<i>C. Cotta and J.M. Troya</i>	
GA Techniques Applied to Contour Search in Images of Bovine Livestock .	482
<i>H.M. González Velasco, C.J. García Orellana, M. Macías Macías, and M.I. Acevedo Sotoca</i>	
Richer Network Dynamics of Intrinsically Non-regular Neurons Measured through Mutual Information.....	490
<i>F. Rodríguez, P. Varona, R. Huerta, M.I. Rabinovich, and H.D.I. Abarbanel</i>	
RBF Neural Networks, Multiobjective Optimization and Time Series Forecasting .....	498
<i>J. González, I. Rojas, H. Pomares, and J. Ortega</i>	
Evolving RBF Neural Networks .....	506
<i>V.M. Rivas, P.A. Castillo, and J.J. Merelo</i>	
Evolutionary Cellular Configurations for Designing Feed-Forward Neural Networks Architectures .....	514
<i>G. Gutiérrez, P. Isasi, J.M. Molina, A. Sanchis, and I.M. Galván</i>	
A Recurrent Multivalued Neural Network for the N-Queens Problem. ....	522
<i>E. Mérida, J. Muñoz, and R. Benítez</i>	

A Novel Approach to Self-Adaptation of Neuro-Fuzzy Controllers in Real Time .....	530
<i>H. Pomares, I. Rojas, J. González, and M. Damas</i>	
Expert Mutation Operators for the Evolution of Radial Basis Function Neural Networks .....	538
<i>J. González, I. Rojas, H. Pomares, and M. Salmerón</i>	
Studying Neural Networks of Bifurcating Recursive Processing Elements – Quantitative Methods for Architecture Design and Performance Analysis .....	546
<i>E. Del Moral Hernandez</i>	
Topology-Preserving Elastic Nets .....	554
<i>V. Tereshko</i>	
Optimization with Linear Constraints in the Neural Network .....	561
<i>M. Oota, N. Ishii, K. Yamauchi, and M. Nakamura</i>	
Optimizing RBF Networks with Cooperative/Competitive Evolution of Units and Fuzzy Rules .....	570
<i>A.J. Rivera, J. Ortega, I. Rojas, and A. Prieto</i>	
Study of Chaos in a Simple Discrete Recurrence Neural Network .....	579
<i>J.D. Piñeiro, R.L. Marichal, L. Moreno, J.F. Sigut, and E.J. González</i>	
Genetic Algorithm versus Scatter Search and Solving Hard MAX-W-SAT Problems .....	586
<i>H. Drias</i>	
A New Approach to Evolutionary Computation: Segregative Genetic Algorithms (SEGA) .....	594
<i>M. Affenzeller</i>	
Evolution of Firms in Complex Worlds: Generalized <i>NK</i> Model .....	602
<i>N. Jacoby</i>	
Learning Adaptive Parameters with Restricted Genetic Optimization Method .....	612
<i>S. Garrido and L. Moreno</i>	
Solving NP-Complete Problems with Networks of Evolutionary Processors .....	621
<i>J. Castellanos, C. Martín-Vide, V. Mitraná, and J.M. Sempere</i>	
Using SOM for Neural Network Visualization .....	629
<i>G. Romero, P.A. Castillo, J.J. Merelo, and A. Prieto</i>	

XXVI Table of Contents, Part I

Comparison of Supervised Self-Organizing Maps Using Euclidian or Mahalanobis Distance in Classification Context.....	637
<i>F. Fessant, P. Akinin, L. Oukhellou, and S. Midenet</i>	
Introducing Multi-objective Optimization in Cooperative Coevolution of Neural Networks.....	645
<i>N. García-Pedrajas, E. Sanz-Tapia, D. Ortiz-Boyer, and C. Hervás-Martínez</i>	
STAR - Sparsity through Automated Rejection .....	653
<i>R. Burbidge, M. Trotter, B. Buxton, and S. Holden</i>	
Ordinal Regression with $K$ -SVCR Machines .....	661
<i>C. Angulo and A. Català</i>	
Large Margin Nearest Neighbor Classifiers .....	669
<i>S. Bermejo and J. Cabestany</i>	
Reduced Support Vector Selection by Linear Programs .....	677
<i>W.A. Fellenz</i>	
Edge Detection in Noisy Images Using the Support Vector Machines .....	685
<i>H. Gómez-Moreno, S. Maldonado-Bascón, and F. López Ferreras</i>	
Initialization in Genetic Algorithms for Constraint Satisfaction Problems..	693
<i>C.R. Vela, R. Varela, and J. Puente</i>	
Evolving High-Posterior Self-Organizing Maps .....	701
<i>J. Muruzábal</i>	
Using Statistical Techniques to Predict GA Performance .....	709
<i>R. Nogueras and C. Cotta</i>	
Multilevel Genetic Algorithm for the Complete Development of ANN .....	717
<i>J. Dorado, A. Santos, and J.R. Rabuñal</i>	
Graph Based GP Applied to Dynamical Systems Modeling .....	725
<i>A.M. López, H. López, and L. Sánchez</i>	
Nonlinear System Dynamics in the Normalisation Process of a Self-Organising Neural Network for Combinatorial Optimisation .....	733
<i>T. Kwok and K.A. Smith</i>	
Continuous Function Optimisation via Gradient Descent on a Neural Network Approximation Function .....	741
<i>K.A. Smith and J.N.D. Gupta</i>	
An Evolutionary Algorithm for the Design of Hybrid Fiber Optic-Coaxial Cable Networks in Small Urban Areas .....	749
<i>P. Cortés, F. Guerrero, D. Canca, and J.M. García</i>	

Channel Assignment for Mobile Communications Using Stochastic Chaotic Simulated Annealing . . . . .	757
<i>S. Li and L. Wang</i>	

## Artificial Intelligence and Cognitive Processes

Seeing is Believing: Depictive Neuromodelling of Visual Awareness . . . . .	765
<i>I. Aleksander, H. Morton, and B. Dunmall</i>	
DIAGEN-WebDB: A Connectionist Approach to Medical Knowledge Representation and Inference . . . . .	772
<i>J. Mira, R. Martínez, J.R. Álvarez, and A.E. Delgado</i>	
Conceptual Spaces as Voltage Maps . . . . .	783
<i>J. Aisbett and G. Gibbon</i>	
Determining Hyper-planes to Generate Symbolic Rules . . . . .	791
<i>G. Bologna</i>	
Automatic Symbolic Modelling of Co-evolutionarily Learned Robot Skills .	799
<i>A. Ledezma, A. Berlanga, and R. Aler</i>	
ANNs and the Neural Basis for General Intelligence . . . . .	807
<i>J.G. Wallace and K. Bluff</i>	
Knowledge and Intelligence . . . . .	814
<i>J.C. Herrero</i>	
Conjecturing the Cognitive Plausibility of an ANN Theorem-Prover . . . . .	822
<i>I.M.O. Vilela and P.M.V. Lima</i>	
<b>Author Index</b> . . . . .	831

Bio-Inspired Applications of Connectionism  
6th International Work-Conference on Artificial and  
Natural Neural Networks, IWANN 2001 Granada, Spain,  
June 13-15, 2001, Proceedings, Part II  
Mira, J.; Prieto, A. (Eds.)  
2001, LIV, 852 p., Softcover  
ISBN: 978-3-540-42237-2