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Altri autori (Persone)	BeliczynskiBartomiej KolehmainenMikko ToivanenPekka
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Space and Data Representation -- On Tractability of Neural-Network Approximation -- Handling Incomplete Data Using Evolution of Imputation Methods -- Ideas about a Regularized MLP Classifier by Means of Weight Decay Stepping -- Connection Strategies in Associative Memory Models with Spiking and Non-spiking Neurons -- Some Enhancements to Orthonormal Approximation of 2D Functions -- Shortest Common Superstring Problem with Discrete Neural Networks -- A Methodology for Developing Nonlinear Models by Feedforward Neural Networks -- A Predictive Control Economic Optimiser and Constraint Governor Based on Neural Models -- Computationally Efficient Nonlinear Predictive Control Based on RBF Neural Multi-models -- Parallel Implementations of Recurrent Neural Network Learning -- Growing Competitive Network for Tracking Objects in Video Sequences -- Emission Analysis of a Fluidized Bed Boiler by Using Self-Organizing Maps -- Network Security Using Growing Hierarchical Self-Organizing Maps -- On Document Classification with Self-Organising Maps -- Evolutionary Computation -- A Heuristic Procedure with Guided Reproduction for Constructing Cocyclic Hadamard Matrices -- Tuning of Large-Scale Linguistic Equation (LE) Models with Genetic Algorithms -- Elitistic Evolution: An Efficient Heuristic for Global Optimization -- Solving the Multiple Sequence Alignment Problem Using Prototype Optimization with Evolved Improvement Steps -- Grid-Oriented Scatter Search Algorithm -- Agent-Based Gene Expression Programming for Solving the RCPSP/max Problem -- Feature Selection from Barkhausen Noise Data Using Genetic Algorithms with Cross-Validation -- Time-Dependent Performance Comparison of Evolutionary Algorithms -- Multiobjective Genetic Programming for Nonlinear System Identification -- NEAT in HyperNEAT Substituted with Genetic Programming -- Simulation Studies on a Genetic Algorithm Based Tomographic Reconstruction Using Time-of-Flight Data from Ultrasound Transmission Tomography -- Estimation of Sensor Network Topology Using Ant Colony Optimization -- Learning -- Scalability of Learning Impact on Complex Parameters in Recurrent Neural Networks -- A Hierarchical Classifier with Growing Neural Gas Clustering -- A Generative Model for Self/Non-self Discrimination in Strings -- On the Efficiency of Swap-Based Clustering -- Sum-of-Squares Based Cluster Validity Index and Significance Analysis -- Supporting Scalable Bayesian Networks Using Configurable Discretizer Actuators -- String Distances and Uniformities -- Emergent Future Situation Awareness: A Temporal Probabilistic Reasoning in the Absence of Domain Experts -- Efficient Hold-Out for Subset of Regressors -- Improving Optimistic Exploration in Model-Free Reinforcement Learning -- Improving Visualization, Scalability and Performance of Multiclass Problems with SVM Manifold Learning -- A Cat-Like Robot Real-Time Learning to Run -- Controlling the Experimental Three-Tank System via Support Vector Machines -- Feature-Based Clustering for Electricity Use Time Series Data -- The Effect of Different Forms of Synaptic Plasticity on Pattern Recognition in the Cerebellar Cortex -- Soft Computing -- Fuzzy Inference Systems for Efficient Non-invasive On-Line Two-Phase Flow Regime Identification -- Machine Tuning of Stable Analytical Fuzzy Predictive Controllers -- Crisp Classifiers vs. Fuzzy Classifiers: A Statistical Study -- Efficient Model Predictive Control Algorithm with Fuzzy Approximations of Nonlinear Models -- Dynamic Classifier Systems and Their Applications to Random Forest Ensembles -- A Fuzzy Shape Descriptor and Inference by Fuzzy Relaxation with Application to Description of Bones Contours at Hand Radiographs -- Hough and Fuzzy Hough Transform in Music Tunes Recognition Systems -- Bioinformatics -- Multiple Order Gradient Feature for

Macro-Invertebrate Identification Using Support Vector Machines -- Bayesian Dimension Reduction Models for Microarray Data -- Gene Selection for Cancer Classification through Ensemble of Methods -- Applications -- Rules versus Hierarchy: An Application of Fuzzy Set Theory to the Assessment of Spatial Grouping Techniques -- A Novel Signal-Based Approach to Anomaly Detection in IDS Systems -- Extracting Discriminative Features Using Non-negative Matrix Factorization in Financial Distress Data -- Evolutionary Regression Modeling with Active Learning: An Application to Rainfall Runoff Modeling -- Gene Trajectory Clustering for Learning the Stock Market Sectors -- Accurate Prediction of Financial Distress of Companies with Machine Learning Algorithms -- Approximation Scheduling Algorithms for Solving Multi-objects Movement Synchronization Problem -- Automatic Segmentation of Bone Tissue in X-Ray Hand Images -- Automatic Morphing of Face Images -- A Comparison Study of Strategies for Combining Classifiers from Distributed Data Sources -- Visualizing Time Series State Changes with Prototype Based Clustering.

Sommario/riassunto

The ICANNGA series of conferences has been organized since 1993 and has a long history of promoting the principles and understanding of computational intelligence paradigms within the scienti'c community. Originally ICANNGA stood for "International Conference on Arti'cial Neural Networks and Genetic Algorithms," but in 2005 the conference was renamed to "International C- ference on Adaptive and Natural Computing Algorithms," while keeping the acronymICANNGA. The'rstICANNGAconferencewasheldinInnsbruckA- tria (1993), then Al´ es in France (1995), Norwich in the UK (1997), Portoroz in Slovenia (1999),Prague in the Czech Republic (2001), Roanne in France (2003), CoimbrainPortugal(2005)andWarsawinPoland(2007).ContinuingthisEu- peantradition,the9thICANNGA washeldinKuopio,Finland(2009).Thevast majority of ICANNGA conferences is organized by and based at a university. Drawing on the experience of previous events and following the same g- eral model, ICANNGA 2009 combined plenary lectures and technical sessions. Apart from being a widely recognized conference, it enhanced the possibility to exchange opinions through lectures and discussions, provided a great oppor- nity to meet new colleagues, as well as to renew old friendships and to facilitate the possibilities for international collaborations. As previously, the conference proceedings are published in the Springer LNCS series.