

Table of Contents

Session 1a: Neural Networks (1)

- A Comparison of Neural Network Input Vector Selection Techniques 1
B. Choi, T. Hendtlass, K. Bluff

- Application of Direction Basis Function Neural Network
to Adaptive Identification and Control 11
M. Jalili-Kharaajoo

- Knowledge Discovery Using Neural Networks 20
K. Kaikhah, S. Doddametti

Session 1b: Bioinformatics (1)

- Knowledge Discovery in Hepatitis C Virus Transgenic Mice 29
*A. Fazel Famili, J. Ouyang, M. Kryworuchko, I. Alvarez-Maya,
B. Smith, F. Diaz-Mitoma*

- Digital Signal Processing in Predicting Secondary Structures of Proteins 40
D. Mitra, M. Smith

- Predicting Protein-Protein Interactions from One Feature Using SVM 50
Y. Chung, G.-M. Kim, Y.-S. Hwang, H. Park

Session 1c: Data Mining (1)

- Fuzzy OLAP Association Rules Mining Based Novel Approach
for Multiagent Cooperative Learning 56
M. Kaya, R. Alhajj

- OIDM: Online Interactive Data Mining 66
Q. Chen, X. Wu, X. Zhu

- A Novel Manufacturing Defect Detection Method Using Data
Mining Approach 77
W.-C. Chen, S.-S. Tseng, C.-Y. Wang

Session 2a: Neural Networks (2)

Neural Representation of a Solar Collector with Statistical Optimization of the Training Set	87
<i>L.E. Zárate, E. Marques Duarte Pereira, J.P. Domingos Silva, R. Vimeiro, A.S. Cardoso Diniz</i>	
An Experiment in Task Decomposition and Ensembling for a Modular Artificial Neural Network.....	97
<i>B. Ferguson, R. Ghosh, J. Yearwood</i>	
The Effect of Deterministic and Stochastic VTG Schemes on the Application of Backpropagation to Multivariate Time Series Prediction	107
<i>T. Jo</i>	

Session 2b: Bioinformatics (2)

Gene Discovery in Leukemia Revisited: A Computational Intelligence Perspective	118
<i>J.J. Valdés, A.J. Barton</i>	
Cell Modeling Using Agent-Based Formalisms	128
<i>K. Webb, T. White</i>	
Computational Identification of RNA Motifs in Genome Sequences	138
<i>G. Narale, J. Beaumont, P.A. Rice, M.E. Schmitt</i>	

Session 2c: General Applications

An Extensible Framework for Knowledge-Based Multimedia Adaptation	144
<i>D. Jannach, K. Leopold, H. Hellwagner</i>	
Methods for Reducing the Number of Representatives in Representation Choice Tasks	154
<i>N.T. Nguyen, C. Danilowicz</i>	
Incremental Maintenance of All-Nearest Neighbors Based on Road Network	164
<i>J. Feng, N. Mukai, T. Watanabe</i>	
Knowledge Intensive Interpretation of Signal Data.....	170
<i>K. Mason, C. Howard</i>	

Session 3a: Autonomous Agents (1)

Coalition Formation among Agents in Complex Problems Based on a Combinatorial Auction Perspective	176
<i>H. Hattori, T. Ozono, T. Ito, T. Shintani</i>	
Multi-agent Based Home Network Management System with Extended Real-Time Tuple Space	188
<i>M.J. Lee, J.H. Park, S.J. Kang, J.B. Lee</i>	
Modelling Multi-aspect Negotiations in Multiagent Systems Using Petri Nets.....	199
<i>M. Lenar, A. Zgrzywa</i>	
Multi-agent Development Toolkits: An Evaluation	209
<i>E. Shakshuki, Y. Jun</i>	

Session 3b: Intelligent Systems (1)

An Artificial Immune System for Fault Detection	219
<i>J. Aguilar</i>	
Heuristic Approach Based on Lambda-Interchange for VRTPR-Tree on Specific Vehicle Routing Problem with Time Windows.....	229
<i>N. Mukai, J. Feng, T. Watanabe</i>	
Stochastic Learning Automata-Based Dynamic Algorithms for the Single Source Shortest Path Problem.....	239
<i>S. Misra, B.J. Oommen</i>	
Multi-agent Based Integration Scheduling System under Supply Chain Management Environment.....	249
<i>H.R. Choi, H.S. Kim, B.J. Park, Y.S. Park</i>	

Session 3c: Knowledge Processing and Natural Language Processing

A Representation of Temporal Aspects in Knowledge Based Systems Modelling: A Monitoring Example.....	264
<i>J.A. Maestro, C. Llamas, C.J. Alonso</i>	
On Description and Reasoning about Hybrid Systems.....	274
<i>K. Nakamura, A. Fusaoka</i>	
A Hybrid Approach to Automatic Word-Spacing in Korean	284
<i>M.-y. Kang, S.-w. Choi, H.-c. Kwon</i>	

Natural Language Requirements Analysis and Class Model Generation Using UCDA	295
<i>D. Liu, K. Subramaniam, A. Eberlein, B.H. Far</i>	

Session 4a: Intelligent User Interfaces

Using Cognitive Modelling Simulations for User Interface Design Decisions	305
<i>B. Emond, R.L. West</i>	

An Intelligent Interface for Customer Behaviour Analysis from Interaction Activities in Electronic Commerce.....	315
<i>C.-C. Hsu, C.-W. Deng</i>	

Integration of an Interactive Multimedia Datacasting System.....	325
<i>W. Li, H. Liu, G. Gagnon</i>	

The Exploration and Application of Knowledge Structures in the Development of Expert System: A Case Study on a Motorcycle System	335
<i>K.-W. Su, S.-L. Hwang, Y.-F. Zhou</i>	

Session 4b: Evolutionary Computing (1)

Binary Decision Tree Using K-Means and Genetic Algorithm for Recognizing Defect Patterns of Cold Mill Strip	341
<i>K.M. Kim, J.J. Park, M.H. Song, I.C. Kim, C.Y. Suen</i>	

Evolutionary RSA-Based Cryptographic Hardware Using the Co-design Methodology	351
<i>N. Nedjah, L. de Macedo Mourelle</i>	

GA-EDA: Hybrid Evolutionary Algorithm Using Genetic and Estimation of Distribution Algorithms	361
<i>J.M. Peña, V. Robles, P. Larrañaga, V. Hervés, F. Rosales, M.S. Pérez</i>	

Session 4c: Fuzzy Logic

Handwritten Numeral Recognition Based on Simplified Feature Extraction, Structural Classification, and Fuzzy Memberships	372
<i>C. Jou, H.-C. Lee</i>	

Using Chaos Theory for the Genetic Learning of Fuzzy Controllers	382
<i>A. Schuster</i>	

A Chromatic Image Understanding System for Lung Cancer Cell Identification Based on Fuzzy Knowledge	392
<i>Y. Yang, S. Chen, H. Lin, Y. Ye</i>	

Session 5a: Human Robot Interaction

Reading Human Relationships from Their Interaction with an Interactive Humanoid Robot.....	402
<i>T. Kanda, H. Ishiguro</i>	
Recognition of Emotional States in Spoken Dialogue with a Robot	413
<i>K. Komatani, R. Ito, T. Kawahara, H.G. Okuno</i>	
Development of an Android Robot for Studying Human-Robot Interaction.....	424
<i>T. Minato, M. Shimada, H. Ishiguro, S. Itakura</i>	
Open-End Human Robot Interaction from the Dynamical Systems Perspective: Mutual Adaptation and Incremental Learning.....	435
<i>T. Ogata, S. Sugano, J. Tani</i>	

Session 5b: Computer Vision and Image Processing

Stereo Camera Handoff.....	445
<i>K. Yuan, H. Zhang</i>	
Word Separation in Handwritten Legal Amounts on Bank Cheques Based on Spatial Gap Distances	453
<i>I.C. Kim, K.M. Kim, C.Y. Suen</i>	
Shape Recognition of the Embryo Cell Using Deformable Template for Micromanipulation.....	463
<i>M.-S. Jang, S.-J. Lee, H.-d. Lee, Y.-G. Kim, B. Kim, G.-T. Park</i>	

Improved Edge Enhanced Error Diffusion Based on First-Order Gradient Shaping Filter.....	473
<i>B.-W. Hwang, T.-H. Kang, T.-S. Lee</i>	

Session 5c: Machine Learning and Case Based Reasoning

Capitalizing Software Development Skills Using CBR: The CIAO-SI System.....	483
<i>R. Nkambou</i>	
A Hybrid Case Based Reasoning Approach for Monitoring Water Quality.....	492
<i>C.A. Policastro, A.C.P.L.F. Carvalho, A.C.B. Delbem</i>	

Constructive Meta-learning with Machine Learning Method Repositories.....	502
<i>H. Abe, T. Yamaguchi</i>	

An Algorithm for Incremental Mode Induction	512
<i>N. Di Mauro, F. Esposito, S. Ferilli, T.M.A. Basile</i>	

Session 6a: Heuristic Search

TSP Optimisation Using Multi Tour Ants.....	523
<i>T. Hendtlass</i>	

Neighborhood Selection by Probabilistic Filtering for Load Balancing in Production Scheduling.....	533
<i>B. Kang, K.R. Ryu</i>	

Systematic versus Non Systematic Methods for Solving Incremental Satisfiability.....	543
<i>M. Mouhoub, S. Sadaoui</i>	

Improved GRASP with Tabu Search for Vehicle Routing with Both Time Window and Limited Number of Vehicles.....	552
<i>Z. Li, S. Guo, F. Wang, A. Lim</i>	

Session 6b: Evolutionary Computing (2)

Robust Engineering Design with Genetic Algorithms.....	562
<i>B. Forouraghi</i>	

Evolutionary Computation Using Island Populations in Time	573
<i>B. Prime, T. Hendtlass</i>	

Genetic Algorithm Based Parameter Tuning of Adaptive LQR-Repetitive Controllers with Application to Uninterruptible Power Supply Systems	583
<i>M. Jalili-Kharaajoo, B. Moshiri, K. Shabani, H. Ebrahimirad</i>	

A Comparison of Two Circuit Representations for Evolutionary Digital Circuit Design	594
<i>N. Nedjah, L. de Macedo Mourelle</i>	

Session 6c: Security

Motif-Oriented Representation of Sequences for a Host-Based Intrusion Detection System.....	605
<i>G. Tandon, D. Mitra, P.K. Chan</i>	

Computational Intelligent Techniques for Detecting Denial of Service Attacks..... 616
S. Mukkamala, A.H. Sung

Writer Identification Forensic System Based on Support Vector Machines
with Connected Components..... 625
M. Tapiador, J. Gómez, J.A. Sigüenza

Modeling Intrusion Detection Systems
Using Linear Genetic Programming Approach 633
S. Mukkamala, A.H. Sung, A. Abraham

Session 7a: Internet Applications

Data Mining in Evaluation of Internet Path Performance 643
L. Borzemski

Change Summarization in Web Collections 653
A. Jatowt, K.K. Bun, M. Ishizuka

Control System Design for Internet-Enabled Arm Robots 663
S.H. Yang, X. Zuo, L. Yang

Source Estimating Anycast for High Quality of Service of Multimedia Traffic 673
W.-H. Choi, T.-S. Lee, J.-S. Kim

Session 7b: Planning and Scheduling

Scheduling Meetings with Distributed Local Consistency Reinforcement 679
A. Ben Hassine, T. Ito, T.B. Ho

Potential Causality in Mixed Initiative Planning 689
Y. El Fattah

Reactive Planning Simulation in Dynamic Environments with *VirtualRobot* 699
O. Sapena, E. Onaindia, M. Mellado, C. Correcher, E. Vendrell

Session 7c: Constraint Satisfaction

New Distributed Filtering-Consistency Approach to General Networks 708
A. Ben Hassine, K. Ghedira, T.B. Ho

A Systematic Search Strategy for Product Configuration 718
H. Xie, P. Henderson, J. Neelamkavil, J. Li

A Bayesian Framework for Groundwater Quality Assessment	728
<i>K. Shihab, N. Al-Chalabi</i>	

Session 8a: E-learning (1)

Facilitating E-learning with a MARC to IEEE LOM Metadata Crosswalk Application	739
<i>Y. Cao, F. Lin, R. McGreal, S. Schafer, N. Friesen, T. Tin, T. Anderson, D. Kariel, B. Powell, M. Anderson</i>	

An Agent-Based Framework for Adaptive M-learning	749
<i>L. Esmahi, E. Badidi</i>	

Determination of Learning Scenarios in Intelligent Web-Based Learning Environment.....	759
<i>E. Kukla, N.T. Nguyen, J. Sobecki, C. Danilowicz, M. Lenar</i>	

Session 8b: Intelligent Systems (2)

An Intelligent GIS-Based Spatial Zoning System with Multiobjective Hybrid Metaheuristic Method	769
<i>B. Chin Wei, W. Yin Chai</i>	

Dynamic User Profiles Based on Boolean Formulas.....	779
<i>C. Danilowicz, A. Indyka-Piasecka</i>	

Application of Intelligent Information Retrieval Techniques to a Television Similar Program Guide.....	788
<i>C. Machiraju, S. Kanda, V. Dasigi</i>	

A Location Information System Based on Real-Time Probabilistic Position Inference.....	797
<i>T. Ito, K. Oguri, T. Matsuo</i>	

Session 8c: Expert Systems

Expertise in a Hybrid Diagnostic-Recommendation System for SMEs: A Successful Real-Life Application	807
<i>S. Delisle, J. St-Pierre</i>	

How to Speed Up Reasoning in a System with Uncertainty?.....	817
<i>B. Jankowska</i>	

Efficient BDD Encodings for Partial Order Constraints with Application to Expert Systems in Software Verification	827
<i>M. Kurihara, H. Kondo</i>	

Abductive Validation of a Power-Grid Expert System Diagnoser	838
<i>J. Ferreira de Castro, L. Moniz Pereira</i>	

Session 9a: E-learning (2)

Integrating Web Services and Agent Technology for E-learning Course Content Maintenance	848
<i>F. Lin, L. Poon</i>	

Chemical Reaction Metaphor in Distributed Learning Environments.....	857
<i>H. Lin, C. Yang</i>	

An E-learning Support System Based on Qualitative Simulations for Assisting Consumers' Decision Making	867
<i>T. Matsuo, T. Ito, T. Shintani</i>	

Session 9b: Applications to Design

Methodology for Graphic Redesign Applied to Textile and Tile Pattern Design	876
<i>F. Albert, J.M. Gomis, M. Valor, J.M. Valiente</i>	

Knowledge Representation on Design of Storm Drainage System	886
<i>K.W. Chau, C.S. Cheung</i>	

Test Case Sequences in System Testing: Selection of Test Cases for a Chain (Sequence) of Function Clusters.....	895
<i>M.Sh. Levin, M. Last</i>	

Supporting Constraint-Aided Conceptual Design from First Principles in Autodesk Inventor	905
<i>A. Holland, B. O'Callaghan, B. O'Sullivan</i>	

Session 9c: Machine Learning

Incremental Induction of Classification Rules for Cultural Heritage Documents	915
<i>T.M.A. Basile, S. Ferilli, N. Di Mauro, F. Esposito</i>	

Applying Multi-class SVMs into Scene Image Classification.....	924
<i>J. Ren, Y. Shen, S. Ma, L. Guo</i>	

Machine Learning Approaches for Inducing Student Models	935
<i>O. Licchelli, T.M.A. Basile, N. Di Mauro, F. Esposito, G. Semeraro, S. Ferilli</i>	

Monte Carlo Approach for Switching State-Space Models.....	945
<i>C. Popescu, Y.S. Wong</i>	

Session 10a: E-learning (3)

Epistemological Remediation in Intelligent Tutoring Systems	955
<i>J. Tchétagni, R. Nkambou, F. Kabanza</i>	

XML-Based Learning Scenario Representation and Presentation in the Adaptive E-learning Environment.....	967
<i>P. Kazienko, J. Sobecki</i>	

Building Ontologies for Interoperability among Learning Objects and Learners	977
<i>Y. Biletskiy, O. Vorochek, A. Medovoy</i>	

Session 10b: Autonomous Agents (2)

Comparison of Different Coordination Strategies for the RoboCupRescue Simulation	987
<i>S. Paquet, N. Bernier, B. Chaib-draa</i>	

Multiple Reinforcement Learning Agents in a Static Environment	997
<i>E. Shakshuki, K. Rahim</i>	

A Modular Architecture for a Multi-purpose Mobile Robot	1007
<i>G. Steinbauer, G. Fraser, A. Mühlenfeld, F. Wotawa</i>	

An Agent-Based E-engineering Services Framework for Engineering Design and Optimization	1016
<i>Q. Hao, W. Shen, S.-W. Park, J.-K. Lee, Z. Zhang, B.-C. Shin</i>	

Session 10c: Neural Networks (3)

Robust and Adaptive Tuning of Power System Stabilizers Using Artificial Neural Networks.....	1023
<i>F. Rashidi, M. Rashidi</i>	

Modified Bifurcating Neuron with Leaky-Integrate-and-Fire Model.....	1033
<i>L. Risinger, K. Kaikhah</i>	

- An Application of Elman's Recurrent Neural Networks to Harmonic Detection ... 1043
F. Temurtas, R. Gunturkun, N. Yumusak, H. Temurtas, A. Unsal

- Design of an Adaptive Artificial Neural Network
for Online Voltage Stability Assessment 1053
M. Rashidi, F. Rashidi

Session 11a: Data Mining (2)

- Mining Multivariate Associations within GIS Environments 1062
I. Lee

- Comparison between Objective Interestingness Measures
and Real Human Interest in Medical Data Mining 1072
M. Ohsaki, Y. Sato, S. Kitaguchi, H. Yokoi, T. Yamaguchi

- Boosting with Data Generation: Improving the Classification
of Hard to Learn Examples 1082
H. Guo, H.L. Viktor

- Data Mining Approach for Analyzing Call Center Performance 1092
M. Paprzycki, A. Abraham, R. Guo, S. Mukkamala

Session 11b: Intelligent Systems (3)

- The Cognitive Controller: A Hybrid, Deliberative/Reactive Control Architecture
for Autonomous Robots 1102
F. Qureshi, D. Terzopoulos, R. Gillett

- Intelligent Systems Integration for Data Acquisition and Modeling
of Coastal Ecosystems 1112
C. Steidley, A. Sadovski, R. Bachna

- Extracting Patterns in Music for Composition via Markov Chains 1123
K. Verbeurgt, M. Dinolfo, M. Fayer

- Analyzing the Performance of Genetically Designed Short-Term
Traffic Prediction Models Based on Road Types and Functional Classes 1133
M. Zhong, S. Sharma, P. Lingras

Session 11c: Neural Networks (4)

- Nonstationary Time Series Prediction Using Local Models Based
on Competitive Neural Networks 1146
G.A. Barreto, J.C.M. Mota, L.G.M. Souza, R.A. Frota

Predictive Modeling and Planning of Robot Trajectories Using the Self-Organizing Map.....	1156
<i>G.A. Barreto, A.F.R. Araújo</i>	

River Stage Forecasting with Particle Swarm Optimization	1166
<i>K.W. Chau</i>	

Convergence Analysis of a Neural Network Based on Generalised Compound Gradient Vector.....	1174
<i>Z. Chen, X. Chen, J. Zhang, L. Liu</i>	

Session 12a: Image Processing

Locating Oil Spill in SAR Images Using Wavelets and Region Growing	1184
<i>R.T.S. Araújo, F.N.S. de Medeiros, R.C.S. Costa, R.C.P. Marques, R.B. Moreira, J.L. Silva</i>	

A New Edge-Grouping Algorithm for Multiple Complex Objects Localization....	1194
<i>Y. Motai</i>	

Processing and Analysis of Ground Penetrating Radar Landmine Detection.....	1204
<i>J. Zhang, B. Nath</i>	

Session 12b: Evolutionary Computing (3)

Tuning of Power System Stabilizers via Genetic Algorithm for Stabilization of Power Systems	1210
<i>F. Rashidi, M. Rashidi</i>	

An Application of Adaptive Genetic Algorithm in Financial Knapsack Problem.....	1220
<i>K.Y. Szeto, M.H. Lo</i>	

Assimilation Exchange Based Software Integration.....	1229
<i>L. Yang, B.F. Jones</i>	

Session 12c: Data Mining (3)

Iterative Semi-supervised Learning: Helping the User to Find the Right Records	1239
<i>C. Drummond</i>	

Semantic Analysis for Data Preparation of Web Usage Mining	1249
<i>J.J. Jung, G.-S. Jo</i>	

Prediction of Preferences through Optimizing Users and Reducing Dimension in Collaborative Filtering System.....	1259
<i>S.-J. Ko</i>	
Author Index	1269