## **Table of Contents**

## **Invited Talks**

How Artificial Intelligence May Be Applied in Real World Situations $\dots$ Zbigniew Michalewicz	1
Modern Machine Learning Techniques and Their Applications to Medical Diagnostics	2
Innovative Applications of Artificial Intelligence Techniques in Software Engineering	3
Machine Learning	
Linear Probability Forecasting	4
The Importance of Similarity Metrics for Representative Users  Identification in Recommender Systems	12
An Optimal Scaling Approach to Collaborative Filtering Using Categorical Principal Component Analysis and Neighborhood Formation	22
A Classroom Observation Model Fitted to Stochastic and Probabilistic Decision Systems	30
Prediction with Confidence Based on a Random Forest Classifier	37
Fuzzy Logic Techniques	
A Generic Tool for Building Fuzzy Cognitive Map Systems	45
A Fuzzy Rule-Based Approach to Design Game Rules in a Mission Planning and Evaluation System	53



One-Dimensional Linear Local Prototypes for Effective Selection of Neuro-Fuzzy Sugeno Model Initial Structure	62
Lasso: Linkage Analysis of Serious Sexual Offences: A Decision Support System for Crime Analysts and Investigators	70
Evolutionary Computation	
Forecasting Euro – United States Dollar Exchange Rate with Gene Expression Programming	78
Automatically Designing Robot Controllers and Sensor Morphology with Genetic Programming  Bert Bonte and Bart Wyns	86
Multiple Criteria Performance Analysis of Non-dominated Sets Obtained by Multi-objective Evolutionary Algorithms for Optimisation	94
Efficiency and Robustness of Three Metaheuristics in the Framework of Structural Optimization	104
Medical Informatics and Biomedical Engineering	
A Fuzzy Non-linear Similarity Measure for Case-Based Reasoning Systems for Radiotherapy Treatment Planning Rupa Jagannathan, Sanja Petrovic, Angela McKenna, and Louise Newton	112
A Soft Computing Approach for Osteoporosis Risk Factor Estimation	120
Protein Secondary Structure Prediction with Bidirectional Recurrent Neural Nets: Can Weight Updating for Each Residue Enhance Performance?	128

Table of Contents	XIII
Contourlet Transform for Texture Representation of Ultrasound Thyroid Images	138
Assessment of Stroke Risk Based on Morphological Ultrasound Image Analysis with Conformal Prediction	146
Text Mining and Natural Language Processing	
Concept Based Representations as Complement of Bag of Words in Information Retrieval	154
Information Fusion for Entity Matching in Unstructured Data Omar Ali and Nello Cristianini	162
An Example-Tracing Tutor for Teaching NL to FOL Conversion	170
Learning the Preferences of News Readers with SVM and Lasso Ranking	179
Knowledge Representation and Reasoning	
A Comparison of Two Ontology-Based Semantic Annotation Frameworks	187
A Tool for Automatic Creation of Rule-Based Expert Systems with CFs	195
Non-standard Reasoning Services for the Verification of DAML+OIL Ontologies	203
Algorithms for the Reconciliation of Ontologies in Open Environments	211

Knowledge-Based Support for Software Engineering	219
Planning and Scheduling	
A Hybrid Searching Method for the Unrelated Parallel Machine Scheduling Problem	230
Aiding Interactive Configuration and Planning: A Constraint and Evolutionary Approach	238
Decentralized Services Orchestration Using Intelligent Mobile Agents with Deadline Restrictions	246
Mobile Robot-Assisted Cellular Environment Coverage	254
Feature Selection and Dimensionality Reduction	
A Novel Feature Selection Method for Fault Diagnosis Zacharias Voulgaris and Chris Sconyers	262
Dimensionality Reduction for Distance Based Video Clustering Jayaraman J. Thiagarajan, Karthikeyan N. Ramamurthy, and Andreas Spanias	270
Towards Stock Market Data Mining Using Enriched Random Forests from Textual Resources and Technical Indicators	278
On the Problem of Attribute Selection for Software Cost Estimation: Input Backward Elimination Using Artificial Neural Networks Efi Papatheocharous and Andreas S. Andreou	287
Engineering Intelligent Systems	
A Fast Mobile Face Recognition System for Android OS Based on Eigenfaces Decomposition	295
Application of Conformal Predictors to Tea Classification Based on Electronic Nose	303

## XVI Table of Contents

Evolutionary Prediction of Total Electron Content over Cyprus	387
$Alexandros \ Agapitos, \ Andreas \ Konstantinidis,$	
Haris Haralambous, and Harris Papadopoulos	
A Multi-layer Perceptron Neural Network to Predict Air Quality	
through Indicators of Life Quality and Welfare	395
Kyriaki Kitikidou and Lazaros Iliadis	
Author Index	403