2015 7th International Joint Conference on Computational Intelligence (IJCCI 2015)

Lisbon, Portugal 12-14 November 2015

Volume 1 Pages 1-375



IEEE Catalog Number:CHISBN:97

CFP1581W-POD 978-1-5090-1968-7 $Copyright @ 2015, SCITEPRESS - Science \ and \ Technology \ Publications \ All \ Rights \ Reserved$

***This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP1581W-POD
ISBN (Print-On-Demand):	978-1-5090-1968-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



CONTENTS

INVITED SPEAKERS

KEYNOTE SPEAKERS AI Researchers, Video Games are your Friends! 5 Julian Togelius Scalable Model based Evolutionary Multi-objective Optimization 7 Yaochu Jin Perpetual Motion, Evolutionary Computation in Industry and other Chimeras 9 Anna Esparcia-Alcázar Evolving Fuzzy Systems - Fundamentals, Reliability, Interpretability, Useability and Applications 11 Edwin Lughofer PAPERS **FULL PAPERS** A Heuristic Solution for Noisy Image Segmentation using Particle Swarm Optimization and Fuzzy Clustering 17 Saeed Mirghasemi, Ramesh Rayudu and Mengjie Zhang On Routine Evolution of New Replicating Structures in Cellular Automata 28 Michal Bidlo Clustering Analysis using Opposition-based API Algorithm 39 Mohammad Reza Farmani and Giuliano Armano Application of Adaptive Differential Evolution for Model Identification in Furnace Optimized Control System 48 Miguel Leon, Magnus Evestedt and Ning Xiong Multi-Strategy Genetic Algorithm for Multimodal Optimization 55 Evgenii Sopov GPGPU Vs Multiprocessor SPSO Implementations to Solve Electromagnetic Optimization Problems 64 Anton Duca, Laurentiu Duca, Gabriela Ciuprina and Daniel Ioan Multi-Robot Cooperative Tasks using Combined Nature-Inspired Techniques 74 Nunzia Palmieri, Floriano de Rango, Xin She Yang and Salvatore Marano GEML: Evolutionary Unsupervised and Semi-Supervised Learning of Multi-class Classification with Grammatical Evolution 83 Jeannie M. Fitzgerald, R. Mohammed Atif Azad and Conor Ryan For Sale or Wanted: Directed Crossover in Adjudicated Space 95 Jeannie M. Fitzgerald and Conor Ryan Design of an Autonomous Intelligent Demand-Side Management System by using Electric Vehicles as Mobile Energy Storage Units by Means of Evolutionary Algorithms 106

Edgar Galván-Lopez, Marc Schoenauer and Constantinos Patsakis

A GISMOO Algorithm for a Multi-Objective Permutation Flowshop with Sequence-Dependent Setup Times Aymen Sioud, Caroline Gagné and julien Dort	116
Particle Convergence Time in the PSO Model with Inertia Weight Krzysztof Trojanowski and Tomasz Kulpa	122
SHORT PAPERS	
Supply of Order-1 Building Blocks for Functions Linearly Combined of Sinusoidal Bases with Integral Frequencies <i>Hongqiang Mo, Zhong Li and Qiliang Du</i>	133
Development of an Evolutionary Algorithm for Design of Electron Guns for Material Processing Colin Ribton and Wamadeva Balachandran	138
Using Genetic Algorithm with Combinational Crossover to Solve Travelling Salesman Problem Anmar Al-Dallal	149
Genetic Algorithm as Machine Learning for Profiles Recognition Yann Carbonne and Christelle Jacob	157
Dynamic Feature Selection with Wrapper Model and Ensemble Approach based on Measures of Local Relevances and Group Diversity using Genetic Algorithm Marek Kurzynski, Pawel Trajdos and Maciej Krysmann	167
A Reward-driven Model of Darwinian Fitness Jan Teichmann, Eduardo Alonso and Mark Broom	174
Weighting and Sampling Data for Individual Classifiers and Bagging with Genetic Algorithms Sašo Karakatič, Marjan Heričko and Vili Podgorelec	180
Combining Development and Evolution - Case Study: One Dimensional Bin-packing Christopher Rajah and Nelishia Pillay	188
Examining the Impact of Neutral Theory on Genetic Algorithm Population Evolution Seamus Hill and Colm O'Riordan	196
Cartesian Genetic Programming in a Changing Environment Karel Slany	204
Elliptical and Archimedean Copulas in Estimation of Distribution Algorithm with Model Migration <i>Martin Hyrš and Josef Schwarz</i>	212
Evolving Four Part Harmony using a Multiple Worlds Model Marco Scirea and Joseph Alexander Brown	220
Towards Finding an Effective Way of Discrete Problems Solving: The Particle Swarm Optimization, Genetic Algorithm and Linkage Learning Techniques Hybrydization Bartosz Andrzej Fidrysiak and Michal Przewozniczek	228
An Evolutionary and Graph-Rewriting based Approach to Graph Generation <i>Aaron Barry, Josephine Griffith and Colm O'Riordan</i>	237
An Improved Single Node Genetic Programming for Symbolic Regression Jiří Kubalík and Robert Babuška	244

Metaheuristic Coevolution Workflow Scheduling in Cloud Environment Denis Nasonov, Mikhail Melnik, Natalya Shindyapina and Nikolay Butakov	252
There is Noisy Lunch: A Study of Noise in Evolutionary Optimization Problems Juan J. Merelo, Federico Liberatore, Antonio Fernández Ares, Rubén García, Zeineb Chelly, Carlos Cotta, Nuria Rico, Antonio M. Mora and Pablo García-Sánchez	261
Multi-Objective Optimization using Microgenetic Algorithm Applied to the Placement of Remote and Manual Switches in Distribution Networks <i>Helton do Nascimento Alves and Railson Severiano de Sousa</i>	269
FPGA Implementation of a Multi-Population PBIL Algorithm João Paulo Coelho, Tatiana M. Pinho and José Boaventura-Cunha	279
Evolutionary Nonlinear Model Output Statistics for Wind Speed Prediction using Genetic Programming <i>Kisung Seo and Byeongyong Hyeon</i>	287
GA-based Action Learning Satoshi Yonemoto	293
Investigation into Mutation Operators for Microbial Genetic Algorithm Samreen Umer	299
A Flexible and Simplified 2D Environment for Evolving Autonomous Virtual Creatures <i>Ricardo Sisnett</i>	306
Cybersecurity and Honeypots: Experience in a Scientific Network Infrastructure Juan Luis Martin Acal, Gustavo Romero López, Pablo Palacín Gómez, Pablo García Sánchez, Juan Julián Merelo Guervós and Pedro A. Castillo Valdivieso	313
Ephemeral Computing and Bioinspired Optimization - Challenges and Opportunities Carlos Cotta, Antonio J. Fernández-Leiva, Francisco Fernández de Vega, Francisco Chávez, Juan J. Merelo, Pedro A. Castillo, David Camacho and Gema Bello-Orgaz	319
Stabilization of Inverted Pendulum System using Intelligent Linear Quadratic Regulator Controller Salawudeen A. Tijani and M. B. Mua'zu	325
Design of a Real Coded GA Processor A. Tsukahara and A. Kanasugi	334
The Vantage Point Bees Algorithm Sultan Zeybek and Ebubekir Koç	340
Discovering Internal Fraud Models in a Stream of Banking Transactions Fabien Vilar, Marc Le Goc, Philippe Bouche and Pierre-Yves Rolland	346
L2 Designer - Language and Tool for Generative Art Tomáš Konrády, Barbora Tesařová and Kamila Štekerová	352
A Genetic Algorithm for Training Recognizers of Latent Abnormal Behavior of Dynamic Systems <i>Victor Shcherbinin and Valery Kostenko</i>	358
Clustering using Cellular Genetic Algorithms Nuno Leite, Fernando Melício and Agostinho Rosa	366
AUTHOR INDEX	375

XIII

2015 7th International Joint Conference on Computational Intelligence (IJCCI 2015)

Lisbon, Portugal 12-14 November 2015

Volume 2 Pages 1-199



IEEE Catalog Number: 0 ISBN: 9

CFP1581W-POD 978-1-5090-1968-7

CONTENTS

INVITED SPEAKERS

KEYNOTE SPEAKERS	
AI Researchers, Video Games are your Friends! Julian Togelius	5
Scalable Model based Evolutionary Multi-objective Optimization <i>Yaochu Jin</i>	7
Perpetual Motion, Evolutionary Computation in Industry and other Chimeras Anna Esparcia-Alcázar	9
Evolving Fuzzy Systems - Fundamentals, Reliability, Interpretability, Useability and Applications <i>Edwin Lughofer</i>	11
PAPERS	
FULL PAPERS	
A Modified Fuzzy Lee-Carter Method for Modeling Human Mortality Duygun Fatih Demirel and Melek Basak	17
Synchronization of Uncertain Chaotic Systems using Generalized Predictive Control based on Fuzzy PID Controllers Zakaria Driss and Noura Mansouri	25
An Order Hyperresolution Calculus for Gödel Logic with Truth Constants and Equality, Strict Order, Delta <i>Dušan Guller</i>	31
Using Evidence Theory in Land Cover Change Prediction to Model Imperfection Propagation with Correlated Inputs Parameters <i>Ahlem Ferchichi, Wadii Boulila and Imed Riadh Farah</i>	47
Choosing Suitable Similarity Measures to Compare Intuitionistic Fuzzy Sets that Represent Experience-Based Evaluation Sets <i>Marcelo Loor and Guy De Tré</i>	57
Bayesian Logistic Regression using Vectorial Centroid for Interval Type-2 Fuzzy Sets Ku Muhammad Naim Ku Khalif and Alexander Gegov	69
Fuzzy Color Descriptors to Index Roman Mosaic-images Wafa Maghrebi, Mohamed A. Khabou and Adel M. Alimi	80

SHORT PAPERS

Evolving Black Box Recursive Modeling Algorithm Orlando Donato Rocha Filho and Ginalber Luiz de Oliveira Serra	89
Hybrid Controller based on Fuzzy Logic for Doubly Fed Induction Generator used in a Chain of Wind Power Conversion Jean N. Razafinjaka and Tsiory Patrick Andrianantenaina	97
Fuzzy Semi-Quantales, (L,M) Quasi-Fuzzy Topological Spaces and Their Duality <i>Mustafa Demirci</i>	105
Interval Type 2- Fuzzy Rule based System Approach for Selection of Alternatives using TOPSIS Abdul Malek Yaakob, Ku M. Naim Ku Khalif, Alexander Gegov and Siti Fatimah Abdul Rahman	112
LEADER EU Program and Its Governance - A Fuzzy Assessment Model Luca Anzilli, Gisella Facchinetti, Giovanni Mastroleo and Alessandra Tafuro	121
Ranking of Interval Type-2 Fuzzy Numbers based on Centroid Point and Spread Ahmad Syafadhli Abu Bakar, Ku Muhammad Naim Ku Khalif and Alexander Gegov	131
Multilinear Objective Function-based Clustering Giovanni Rossi	141
Contribution to Automatic Design of a Hierarchical Fuzzy Rule Classifier Cristhian Molina, Vincent Bombardier and Patrick Charpentier	150
Fuzzy Control of a Water Pump for an Agricultural Plant Growth System José Dias, João Paulo Coelho and José Alexandre Gonçalves	156
Fuzzy Modeling of Development of Sheets Number in Different Irrigation Levels of Irrigated Lettuce with Magnetically Treated Water Fernando F. Putti, Luís Roberto Almeida Gabriel Filho, Camila Pires Cremasco and Antonio Evaldo Klar	162
Many-Valued Logic through Its History <i>Angel Garrido</i>	170
A New Approach to Aggregation of Inconsistent Expert Opinions Andrzej Piegat and Karina Tomaszewska	176
Hybrid Methodology Focused on the Model of Binary Patterns and the Theory of Fuzzy Logic for Facial Biometric Verification and Identification Sergio González Nava, Alberto J. Rosales Silva, Nidiyare Hevia Montiel, Francisco Javier Gallegos Funes and Mario Dehesa González	180
Template-based Affine Registration of Autistic Brain Images Porawat Visutsak	188
A Fuzzy Poisson Naive Bayes Classifier for Epidemiological Purposes Ronei Marcos de Moraes and Liliane S. Machado	193
AUTHOR INDEX	199

2015 7th International Joint Conference on Computational Intelligence (IJCCI 2015)

Lisbon, Portugal 12-14 November 2015

Volume 3 Pages 1-175



IEEE Catalog Number: CF ISBN: 978

CFP1581W-POD 978-1-5090-1968-7

CONTENTS

INVITED SPEAKERS

KEYNOTE SPEAKERS	
AI Researchers, Video Games are your Friends! Julian Togelius	5
Scalable Model based Evolutionary Multi-objective Optimization <i>Yaochu Jin</i>	7
Perpetual Motion, Evolutionary Computation in Industry and other Chimeras Anna Esparcia-Alcázar	9
Evolving Fuzzy Systems - Fundamentals, Reliability, Interpretability, Useability and Applications <i>Edwin Lughofer</i>	11
PAPERS	
FULL PAPERS	
A Comparison of Learning Rules for Mixed Order Hyper Networks <i>Kevin Swingler</i>	17
Neurosolver Learning to Solve Towers of Hanoi Puzzles Andrzej Bieszczad and Skyler Kuchar	28
Mining Significant Frequent Patterns in Parallel Episodes with a Graded Notion of Synchrony and Selective Participation <i>Salatiel Ezennaya-Gomez and Christian Borgelt</i>	39
A Heteroassociative Learning Model Robust to Interference Randa Kassab and Frédéric Alexandre	49
Control of Three-Phase Grid-Connected Microgrids using Artificial Neural Networks Shuhui Li, Xingang Fu, Ishan Jaithwa, Eduardo Alonso, Michael Fairbank and Donald C. Wunsch	58
An Extended Q Learning System with Emotion State to Make Up an Agent with Individuality Masanao Obayashi, Shunsuke Uto, Takashi Kuremoto, Shingo Mabu and Kunikazu Kobayashi	70
Sources Separation of Mono Signal based on Convolutive NMF Giovanni Costantini, Massimiliano Todisco and Giovanni Saggio	79

SHORT PAPERS

Time Series Forecasting using Clustering with Periodic Pattern Jan Kostrzewa	85
Predicting Flight Departure Delay at Porto Airport: A Preliminary Study Hugo Alonso and António Loureiro	93
Pedestrian Action Prediction using Static Image Feature Kenji Nishida, Takumi Kobayashi, Taro Iwamoto and Shinya Yamasaki	99
Perceptron Learning for Classification Problems - Impact of Cost-Sensitivity and Outliers Robustness <i>Philippe Thomas</i>	106
Machine Learning Techniques and the Existence of Variant Processes in Humans Declarative Memory Alex Frid, Hananel Hazan, Ester Koilis, Larry M. Manevitz, Maayan Merhav and Gal Star	114
A Yet Faster Version of Complex-valued Multilayer Perceptron Learning using Singular Regions and Search Pruning Seiya Satoh and Ryohei Nakano	122
Gaussian Nonlinear Line Attractor for Learning Multidimensional Data Theus H. Aspiras, Vijayan K. Asari and Wesam Sakla	130
Investment Support System using the EVOLINO Recurrent Neural Network Ensemble Algirdas Maknickas and Nijolė Maknickienė	138
SO(2) Approximate Identity Neural Networks are Universal Approximators Saeed Panahian Fard and Zarita Zainuddin	146
Diffusion Bases Dimensionality Reduction Alon Schclar and Amir Averbuch	151
Inedited SVM Application to Automatically Tracking and Recognizing Arm-and-Hand Visual Signals to Aircraft <i>Giovanni Saggio, Francesco Cavrini and Franco Di Paolo</i>	157
Artificial Neural Networks for In-silico Experiments on Perception Simon Odense	163
Learning-based Distance Evaluation in Robot Vision - A Comparison of ANFIS, MLP, SVR and Bilinear Interpolation Models <i>Hossam Fraihat, Kurosh Madani and Christophe Sabourin</i>	168
AUTHOR INDEX	175