2011 Fourth International Workshop on Advanced Computational Intelligence

(IWACI 2011)

Wuhan, China
19-21 October 2011
# Table of Contents

Application of Rough Set and Genetic Algorithm to Transformer Fault Diagnosis ..................1  
   Ji Zhu and Ying Yu

Research on Distributed Computing of EAI Platform System ............................................7  
   Ping Xu and Kun Luo

Flexible Job-shop Scheduling with Integrated Genetic Algorithm ........................................13  
   Ming Wan, Xiaohui Xu, and Jianguo Nan

One Method to Raise the Estimation Precision of Priori Distribution Using Information  
   Distribution ..................................................................................................................17  
   Hui Wang

Breaking DES in Tile Assembly Models ..............................................................................20  
   Zhihua Chen, Xu Jin and Xiaolong Shi

System of Systems Vulnerability Analysis with Automated Planning .................................30  
   Zhong Zheng, Yiming Bi, and Mei Yang

The Model of Measuring Melons’ Sugar based on Resistance and Capacitance ..................34  
   Mei Liu, Zhenhong Jia, Yongbo Yao, and Xiaohui Huang

Nondestructive Inspection of Melon’s Sugar Content Based on Impedance Characteristics ....37  
   Yongbo Yao, Zhenhong Jia, Mei Liu, and Xiaohui Huang

V-BLAST Sphere Decoding with Pre-searching using Genetic Algorithm ............................41  
   Lin Dong

Robust Mission Planning based on Nested Genetic Algorithm ............................................45  
   Luohao Tang, Cheng Zhu, Weiming Zhang, and Zhong Liu

Optimum Design of the Node Ball Clamping Device Based on Improved Genetic Algorithm ....50  
   Shanle Cai, Haidong Zhou, and Hewei Zheng

Spanning Tree Problem Based on Sticker Model ....................................................................54  
   Kang Zhou, Xiaojun Tong, Liu Ying, and Zhen Cheng

A Novel Object Representation Model for Object Detection ..............................................59  
   Yihua Lan, Haozheng Ren, Yong Zhang, Hongbo Yu, and Guangwei Wang

Using GA for Land Use Planning .....................................................................................64  
   Zhouqiao Ren and Xiaonan Lu

Multi-swarm Cooperation for Multi-modal Functions in Repulsive Potential Field .............70  
   Qin Tang, Yi Shen, Chengyu Hu, and Jianyou Zeng

The Development and Validation of An Indoor Experimental Platform for UAV Control  
   System .......................................................................................................................75  
   Shu Shi, Fei Hu, Jian Li, and Jianguo Yao

Real time path planning for UAV Based on Focused D ......................................................80
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining Discriminative Items in Multiple Data Streams with Hierarchical Counters Approach</td>
<td>172</td>
</tr>
<tr>
<td>Majid Seyfi</td>
<td></td>
</tr>
<tr>
<td>Structure-encoding Differential Evolution for the Maximum Independent Set Problem</td>
<td>177</td>
</tr>
<tr>
<td>Changshou Deng, Yanlin Yang, and Hu Peng</td>
<td></td>
</tr>
<tr>
<td>Weighted Passive Nearest Neighbor Algorithm: a Newly-Developed Supervised Classifier</td>
<td>181</td>
</tr>
<tr>
<td>Kaiyuan Feng, Yudong Cai, Junhui Gao, Kairui Feng, Lei Liu, and Yixue Li</td>
<td></td>
</tr>
<tr>
<td>A System of Man-Computer Real Tim Optimalization for Catalytic Cracking Gasoline-Final Boiling Point</td>
<td>186</td>
</tr>
<tr>
<td>Jing Chen and Guoyan Yang</td>
<td></td>
</tr>
<tr>
<td>The Modal Analysis of Boom Based on PZ-30 Excavator</td>
<td>189</td>
</tr>
<tr>
<td>Jing Zhang, Jinge Wang, and Yuanwen Wu</td>
<td></td>
</tr>
<tr>
<td>A Differential Evolution Algorithm Combined with Cloud Model for RFID Reader Deployment</td>
<td>193</td>
</tr>
<tr>
<td>Ying Gao, Xiao Hu, Lingxi Peng, Huiliang Liu, and Fufang Li</td>
<td></td>
</tr>
<tr>
<td>New Advances in Aircraft MRO Services: Data Mining Enhancement</td>
<td>199</td>
</tr>
<tr>
<td>Jun Yu, Stephen Gulliver, Yinshan Tang, and Lisheng Ke</td>
<td></td>
</tr>
<tr>
<td>A Structure for Children-Oriented Human Computer Interaction</td>
<td>205</td>
</tr>
<tr>
<td>Zhigang Fang, Weibin Luo, and Jie Xu</td>
<td></td>
</tr>
<tr>
<td>Real-time Data Stream Clustering based on Distance, Density and Boundary Detection</td>
<td>209</td>
</tr>
<tr>
<td>Xiaolong Zhang, Xiaobo Liang, and Bo Li</td>
<td></td>
</tr>
<tr>
<td>Fault Diagnosis Method based on Multiple Sparse Kernel Classifiers</td>
<td>213</td>
</tr>
<tr>
<td>Xiaogang Deng and Xuemin Tian</td>
<td></td>
</tr>
<tr>
<td>Dynamic Combination of Multiple Classifiers Based on Central Similarity</td>
<td>219</td>
</tr>
<tr>
<td>Hui Wang and Binghan Liu</td>
<td></td>
</tr>
<tr>
<td>Neural-Base Human’s Abnormal Gait Detection Using Force Sensitive Resistors</td>
<td>224</td>
</tr>
<tr>
<td>Pawin Jawayon, Thanate Khaorapapong, and Chawalit Seatang</td>
<td></td>
</tr>
<tr>
<td>Real-time Carbon Dioxide Emission Monitoring System Based on Participatory Sensing Technology</td>
<td>230</td>
</tr>
<tr>
<td>Ruiyun Yu, Wanqian Wu, Nian Xia, Haobo Geng, and Mingyu Liu</td>
<td></td>
</tr>
<tr>
<td>A New Algorithm for Promoter Prediction and Identification</td>
<td>236</td>
</tr>
<tr>
<td>Rongxin Fang, Shuanhu Wu, Wenyan Zhang, Qicheng Liu, and Yibin Song</td>
<td></td>
</tr>
<tr>
<td>Study and Implement of Interactive Animation in Virtual Model Room Based on the VRML</td>
<td>242</td>
</tr>
<tr>
<td>Yanxia Zhao</td>
<td></td>
</tr>
<tr>
<td>Mining Traffic Flow Data Based on Fuzzy Clustering Method</td>
<td>245</td>
</tr>
</tbody>
</table>
Chunchun Hu and Xiaohong Yan

Automatic Verification of Event-Driven Control Programs: a Case Study ................................................. 249

Peizun Liu, Guiming Luo, Mo Xia, and Maosong He

Analysis of a Class of Chua’s System ................................................................. 257

Jiqing Liu and Jinhua Huang

Analysis and Improvement of a Threshold Signature Scheme with Fault-Tolerance .......... 261

Junjie He, Chuanda Qi, and Fang Sun

Fuzzy Self-Adaptive PID Control Strategy for a 2DOF Arm Power Assistant System ........ 265

Zhenyu Wang, Jinge Wang, and Junmin Li

Data Model Driven Architecture (DMDA) ........................................................................ 269

Chen Chen, Xueguang Chen, and Liu Hong

Improved Post-nonlinear Independent Component Analysis Method Based on Gaussian Mixture Model ....................................................................................... 274

Lianfang Cai and Xuemin Tian

A Review on Applicability of Expert System in Designing and Control of Autonomous Cars ........................................................................................................... 280

Hurieh Khalajzadeh, Chitra Dadkhah, and Mohammad Mansouri

A New Pruning Algorithm for Feedforward Neural Network ........................................ 286

Fangju Ai

Remote Sensing Image Classification with Parameter Optimized Support Vector Machine based on Evolutionary Computation ........................................................................ 290

Wei Yao and Min Han

New Operators on Fuzzy Matrices .............................................................................. 295

Yanping Zhang and Mingwen Zheng

A Grey-Box Neural Network based Model Identification and Fault Estimation Scheme for Nonlinear Dynamic Systems ......................................................................................... 300

Zhaoxue Cen, Jiaolong Wei, and Rui Jiang

Training ANFIS System using DE Algorithm ................................................................. 308

Allahyay Zohoori Zangeneh, Mohammad Mansouri, Mohammad Teshnehlab, and Ali Khaki Sedigh

Quantized Neuronal Modeling: Quantum Gate Structure in Elman Networks ................ 315

Penghua Li, Yi Chai, and Qingyu Xiong

Clustering-based Extraction of Near Border Training Samples for Classification of Remote Sensing Image ............................................................................................. 321

Xiaoyong Bian and Xiaolong Zhang

A Neural Network Algorithm for Solving Generalized Convex Programming ............... 325

Jingli Yang and Tingsong Du
CO₂ Capture Process System
Qing Zhou, Yuxiang Wu, Christine Chan, Paitoon Tontiwachwuthikul, Raphael Idem, and Don Gelowitz

Language Grounding Model: Connecting Utterances and Visual Attributions
Wei Zhang and Xiaojie Wang

Research of Decision Fusion for Multi-source Remote-Sensing Satellite Information based on SVMs and DS Evidence Theory
Zhuang Chang, Xuejun Liao, Yan Liu, and Wei Wang

Functional Network Analysis of Insight in Resting-state Brain Activity
Meng Hu, John Kounios, Mark Beeman, and Hualou Liang

Spatial Database for Digital Evolutionary Machines in an Artificial World without Knowledge-Base
Istvan Elek, Janos Roden, and Thai Binh Nguyen

Image Interpolation Based on the Pixel Value Corresponding to the Smallest Absolute Difference
Rukundo Olivier, Kaining Wu, and Hanqiang Cao

A Novel Image Deblurring Method based on High-order MRF Prior
Bo Zhao and Wensheng Zhang

The Necessary and Sufficient Conditions of Asymptotic Stability of Discrete-time Dynamic Systems
Xinquan Zhao

A Thermal Model for Heating of Rat Skin by Millimeter Waves
Shuangxi Hu, Chunli Fan, Li Yang, Fengrui Sun, and Wei Kou

Novel Model of Comprehensive Quality Evaluation for College Students based on Multiple Attribute Decision
Zhongcheng Zhang, Wuyi Yu, and Teng Fei

The Application of Feature Selection Methods to Analyze the Tissue Microarray Data
Weipeng Lin, Kunhong Liu, and Guoyan Liu

Lasso Logistic Regression based Approach for Extracting Plants Coregenes Responding to Abiotic Stresses
Jinxing Liu, Chunhou Zheng, and Yong Xu

Vehicle Scheduling and Dispatching of Ready Mixed Concrete
Yang Zhang, Menglei Li, and Zhenyuan Liu

A Model of Cooperative Air-defense System of System for Surface Warship Formation based on Immune Multi-agent
Jun Wang, Xiaozhe Zhao, Yinhuan Zhang, and Buyun Wang
Event Recognition Based on Bag of Local Space-time Interest Points’ Features
Chuanmin Zhai, Yilan Guo and Jixiang Du

Asymptotic Characters on Cohen-Grossberg Neural Networks Involving S-type Distributed
Delays
Jun Yang and Xingzhao Zhang

Global Exponential Stability of Hopfield Neural Networks with Time-Varying Delays
Jiqing Liu and Jinhuai Huang

Bifurcation Analysis of a Discrete-Time Prey-Predator System under the Feedback
Control
Junxia Que and Biwen Li

Positive Periodic Solution for A Delay Diffusive Predator-Prey System with Holling Type III
Functional Response and Harvest Impulse
Zhengwen Tu, Zhongwei Zha, Ting Zhang, and Jigui Jian

A Method of Dynamic Calibration for Installation Error of Radar Payload
Lin Wen, Zhong Liu, and Zhikun Liu

Design and Realization of Region Weather Modification Operation Conditions Website for
Integrated Monitor and Analysis in East China
Weifei Jiang and Qi Luo

Parameters Optimization of Closed-loop Time-delayed Filter System
Hong Li, Bisheng Shi, and Qi Luo

Modeling and Analysis of Dual Sources Jamming
Qina Gao, Ying Zhu, and Changlin Wang

A Method for Fusing Incomplete Demand Information Based on Information Similarity
Dong Xiang, Yong Zhao, and Yang Chen

Landslide Monitoring System Based on RTK Technology
Bo Lei, Qing Li, and Xiong Li

A New Circle Targets Extraction Method from High Resolution Remote Sensing Imagery
Z. Chen, J. G. Liu, and G. Y. Wang

Suppression and Stabilization by Noise on A Class of Nonlinear Systems under Markov
Switching
Lizhu Feng and Yaping Wu

A Revision of the Newton Iteration Format for Nonlinear Equation
Ying Wei

Recognition of 3D Objects in Arbitrary Pose Using a Fuzzy Associative Database
Algorithm
Aaron Mavrinac, Xiang Chen, and Ahmad Shawky
Weapon Research Project Cost Evaluation Method Based on Technology Readiness
Tengda Guo, Mengjun Li, and Chaomin Ou

Research on Parameters Identification Based on Adline Neural Network for Characteristic Equation of Pump
Qinghui Wu, Zhongdang Yu, Shuo Ding, and Youlin Yang

Mass Detection Based on Integrated Region Growing and Level Set Method
Jun Liu, Jianxun Chen, Xiaoming Liu, and J Tang

An Intelligent Displacement Back-Analysis Method for the Right-bank Slope of Dagangshan Hydropower Station
Zufang Qi, Qinghui Jiang, Qin Zhang, and Chuangbing Zhou

A new scatter search approach for the single machine total weighted tardiness scheduling problem with sequence-dependent setup times
Qingxin Guo and Lixin Tang

Combining the Self-adaptive Neural Network and Support Vector Machine for Online Clustering and Image Segmentation
Kan Li and Ruipeng Liu

Stability in Distribution of Hopfield Stochastic Neural Networks with Markovian Switching
Lifeng Xu

Comparative Research on Methods of Dimensionality Reduction in High-dimension Medical Data
Xuemin Mao, Chuanxi Cai, and Bingyu Sun

A Novel Type of Trigonometric Neural Network Trained by Extended Kalman Filter
M. Norouzi, M. Mansouri, M. Teshnehlab, and M. Aliyari Shoorehdeli

Algebraic Condition of Control for Multiple Time-Delayed Chaotic Cellular Neural Networks
Lu Yan, Hanlin He, and Ping Xiong

The Agent-based Simulation of Inventory-based Model’s Impact on Market Maker Trading Mechanism
Yi Wang, Hongtao Zhou, and Wei Zeng

A Temporal Bayesian Network Based on Uncertain Time Interval
Jian Wang, Chuanfei Tu, and Hongwei Wang

An Equilibrium Analysis of R&D Decision-making in Defense Procurement with Cost-reimbursement based on Quotas under Incomplete Information
Yifang Tang, Changchen Liu, and Taosheng Wang

A Research on Equilibrium of Outsourcing Service Competition With Endogenous Decisions
Order ……………………………………………………………………………………………………………616

Taosheng Wang, Changchen Liu, and Yan Li

Solving Scheduling Problems for Business Use using Computational Intelligence …………….621

K. Nurmi and J. Kyngäs

Competitive Analysis of Online Leasing Problem with Discount Quotation ………………629

Bin Liu, Chunlin Xin, and Shaobai Kan

Comprehensive Evaluation System and the Strategies Research on Hospital Management under Politics and Economics ……………………………………………………………………635

Wenjun Xie and Sijian Xie

An Investigate of Mass Diagnosis in Mammogram with Random Forest ……………………638

Jun Liu, Jianxun Chen, Xiaoming Liu, and J Tang

Improved Opposition-based Biogeography Optimization …………………………………642

Xin Yang, Jiangtao Cao, Kairu Li, and Ping Li

Network Supported Intelligent Cooperative Diagnosis for Difficult and Complicated Cases in Traditional Chinese Medicine ……………………………………………………………648

John S. Shieh

Direct Adaptive NN Control of Ship Course Autopilot with Input Saturation ……………655

Junfang Li, Tieshan Li, Zhongzhou Fan, Renxiang Bu, Qiang Li, and Jiangqiang Hu

A Competitive-Cooperative Co-evolutionary Optimization Algorithm Based on Cloud Model …………………………………………………………………………………662

Wei Li and Lei Wang

Hopf Bifurcation Analysis for a Harvested Differential-algebraic Prey-predator Model ………670

Wei Liu, Chaojin Fu, and Chunsheng Zhang

Deformation Prediction of Landslide Based on Genetic-Simulated Annealing Algorithm and BP Neural Network ………………………………………………………………………675

Huangqiong Chen and Zhigang Zeng

Independence Analysis of Equations Extended by XL Algorithm ……………………………680

Fan Zhang, Xuzhan Guo, and Junhui Song

Fuzzy Rough Neural Network and Its Application to Feature Selection ……………………684

Jun Y. Zhao and Zhi L. Zhang

Exploring the Influencing Factors on Surfing Behavior Intention of Smartphone Users ………688

Lin Wang, Feng Liu, Yang Zhao, and Kan Shi

A Research of Institution Design Based on Social Choice …………………………………693

Aihe Wang, Yunfeng Luo, and Yan Li

Dynamic Consistency of Rent-seeking Contest ………………………………………………697

Changlin Wu, Changchen Liu, Yunfeng Luo, and Yan Li
A Hybrid Robust Scheduling for Single Machine Subject to Random Machine Breakdown….700
Qiaoyun Li, Likai Liang, and Wei Qiao

Research of Pressurizer Water Level Control System Based on Fuzzy-PID Control..............706
Jianghua Guo, Xiaoli Sun, and Hao Wu

A New Form of Countable SP-Compactness and the SP-Lindel of Property.........................710
Shizhong Bai, Xiaodan He, and Chunyan Zhang

Multi-mode Human-Machine Interface Oriented to Space Service Robot..........................714
Genghuang Yang, Feifei Wang, Shigang Cui, Li Zhao, Qingguo Meng, and Hongda Chen

A GA-Fuzzy Automatic Generation Controller for Interconnected Power Systems..............719
Craig D. Boesack, Tshilidzi Marwala, and Fulufhelo V. Nelwamondo

Research on the Tele-Operation Robot System with Tele-Presence..................................725
Guang Wen and Yongchun Xie

Quantitative Analysis of Serial Criminal..........................................................................729
Qian Yang, Junjie Wang, Xian Xu, and Taigui Qin

A Hybrid Clonal Selection Algorithm for Solving Job-Shop Scheduling Problems.............735
Jiangqiang Hu, Tieshan Li, and Jianchuan Yin

An Immuno Inspired Approach to Generate White Noise..............................................742
Mateus Giesbrecht and Celso Pascoli Bottura

Immuno Inspired Approaches to Model Discrete Time Series at State Space.....................750
Mateus Giesbrecht and Celso Pascoli Bottura

Outer Synchronization between Two Complex Networks with Identical and Nonidentical
Topological Structures........................................................................................................757
Jun Mei, Minghui Jiang, and Zouchun Huang

Research on the Cooperated Engagement Capability Used in the Anti-Submarin...............763
Xiao Liu and Zhong Liu

A Modified LEACH Protocol for Wireless Sensor Networks...........................................766
Zhong Liu, Zhikun Liu, and Lin Wen

An Effective Adaptive Equalization Algorithm for Underwater Acoustic Communications....770
Zhong Liu, Xiaoling Ning, Linsen Zhang, and Haizhu Xu

A Research on Modeling of the Weapon Scheduling Problem in Multi-platform Cooperative
Air-Defense Operations......................................................................................................775
Liang Yu, Changfeng Xing, and Zhangsong Shi

A Fuzzy Lyapunov Synthesis for Task Scheduling in Sensor Networks...............................780
Rui Li, Hangyu Wang, and Zhangsong Shi

Simulation of Working Process for A Powerful Underwater Vehicle Cam Engine...............783
Qinchao Xu, Shuzong Wang, and Yongqing Lian