2009 International Conference on Artificial Intelligence and Computational Intelligence

AICI 2009

Table of Contents

Volume - 4

Preface - Volume 4 ...........................................................................................................................................xiv
Organizing Committee - Volume 4 .............................................................................................................xv
Program Committee - Volume 4 .................................................................................................................xvi
Reviewers - Volume 4 ...................................................................................................................................xviii

Intelligent Control (II)

Global Sliding Mode Control for Brushless DC Motors by Neural Networks ..................................................3
  Zhiqiang Cheng, Chongsheng Hou, and Xiaojin Wu
Importance Performance Analysis Based Fuzzy Neural for Determining Critical Service Attributes ..........................................................7
  Hong-Zhen Zheng, Dian-Hui Chu, and Xiaofei Xu
Leader-Following Control of Multi-agent Consensus for a Discrete-Time Case ........................................11
  Bo Liu, Haili Liang, Jie Zhang, and Jianwen Wang
Model Reference Adaptive Control of a Class of Uncertain Nonlinear Systems Based on Neural Networks .............................................................................16
  Pengnian Chen
Multi-objective PID Controller Based on NSGA-II Algorithm with Application to Main Steam Temperature Control ........................................................................21
  Xiang-zhong Guan
Neural Network Control Techniques of Hybrid Active Power Filter .............................................................................26
  You-hua Jiang and Yong-wei Chen
Nonlinear Fuzzy Robust Adaptive Control of a Longitudinal Hypersonic Aircraft Model .................................................................31
  Yanbin Liu and Yuping Lu
Research on Fuzzy-PID Composite Control Strategy for Hydroelectric Generating Unit ..............................................................36
  Shuqing Wang, Zipeng Zhang, and Hui Liu
Study on Framework of STEP-NC Controller with On-machine Inspection ..................................................................................40
  Junzhe Tan, Chengrui Zhang, Riliang Liu, and Xihui Liang
Study on Intelligent Communication Module for Programmable Logic Controller ...........................................................................45
  Sheng Lu, Zhong-Jian Cai, and Tan Liu
TCP Vegas-like Expert-Controlled Multicast Congestion Control Algorithm for Wireless Networks ..........................................................50
  Qiaoyan Kang, Jianfeng Wang, and Xiangru Meng
The Research of Complex BP Neural Network PID Control ...........................................................................................................55
  Yang Xue, Jian-hua Ye, Hong Qian, and Xu-hong Yang
The System of Lifetime Prediction for VFD Based on VB and MATLAB ..........................................................................................59
  Jianping Zhang, Ruitao Wang, and Lingling Pan
Variable Universe Adaptive Fuzzy Control on the Triple Inverted Pendulum and Choosing Contraction-Expansion Factor ........63
  Xiaofeng Gong, Hongxing Li, Guannan Deng, and Haigang Guo

Heuristic Searching Methods

A Novel PSO for Multi-stage Portfolio Planning ................................................................................................................................71
  Zhangjun Wu, Zhiwei Ni, Chang Zhang, and Lichuan Gu
Optimizing Highway Tolls with an Intelligent Simulated Annealing Method ................................................................................78
  Wei Liu and J.T. Ma

Fuzzy Logic and Soft Computing

A Quantitative Method for Reasoning about Knowledge ................................................................................................................85
  Qian Lan and Teng Ma
An Application of Fuzzy Cognitive Map Based on Active Hebbian Learning Algorithm in Credit Risk Evaluation of Listed Companies .................................................................89
  Dong-Sheng Zhai, Ya-Nan Chang, and Juan Zhang
Application of ANN in the Thickness Measuring of Conductive Materials .........................................................................................94
  Wei Zhang, Surong Qu, Li Li, Qinglin Miao, and Changyuan Song
Design of Self-Adapting Fuzzy Controller with Two Stages Variable Universe ..............................................................................98
  Jianliang Meng and Guangxing Yang
Fuzzy Multi-attribute Decision Making Based on Degree of Grey Incidence and TOPSIS in Open Tender of International Project about Contractor Prequalification Evaluation Process ..........................................................................................101
  Donghong Cui and Rong Yang
Parametric Modeling of Learning Management System Using Fuzzy Logic and Intelligent Decision Vectors .................................................................106
Gupta Lovi Raj, Dhawan Avneet Kaur, and Kirti Kaur

Multivariate Linear Regression Model Based on Fuzzy Variable in Econometrics .................................................................................................111
Kaiqi Zou, Xiaoyue Zhou, and Ying Liu

NRFCM: A New Robust Fuzzy Clustering Algorithm for Image Segmentation ..........................................................115
Guochen Zhang and Ming Yang

Soft Computing-Based Cutter Layout Design of Rock Tunnel Boring Machine ..........................................................120
Zhijie Liu and Hongfei Teng

Studies on the Extensions of BL Algebra ................................................................................................................125
Yingcang Ma

Study of Fuzzy Control in Direct Torque Control System .................................................................................................129
Baishan Mei, Haihua Liu, and Jinping Zhang

TSK Fuzzy Modeling Based on Kernelized Fuzzy Clustering and Least Squares Support Vector Machines ..........................................................133
Wei Liu

Expert Systems

A Method of Fuzzy Reasoning Based on Semantic Similarity and Bipartite Graph Matching .................................................................141
Qiang Niu, Shixiong Xia, Guojun Tan, and Zuhui Hu

Evaluation of Intelligent Greenhouse Climate Control System, Based Fuzzy Logic in Relation to Conventional Systems ..................................................146
Payam Javadikia, Ahmad Tabatabaeefar, Mahmoud Omid, Reza Alimardani, and Madjid Fathi

Expert Consulting Service Platform for Forest Pests and Diseases Prevention of Rapid-Growing and High-Yield Forest in Northeast of China ..........................................................151
Wang Nihong, Li Dan, Pan Hua, and Zhang Yannong

Prediction of Probable Tuna Fishing Grounds Based on Bayesian Theorem .................................................................................................156
Sufang Zhou, Wei Fan, and Jianping Wu

Distributed AI and Agents

A Hybrid E-institution Model: From the Static to the Dynamic .................................................................................................165
Youming Zhou and Ji Gao

An Agent-Based Simulation Model of Options Market .................................................................................................175
Zhang Jie, Cui Jing, Zhai Dongsheng, and Zhang Quan

Fuzzy Logic to Support Bilateral Agent Negotiation in E-commerce .................................................................................................179
Bao-he Zuo and Yu Sun

Multi-agent Based Power Grid Data Integration and Sharing Platform .................................................................................................184
KeHe Wu, Cheng Duan, and QianHui Shi
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA-An Agent BDI Model Based on Role</td>
<td>189</td>
</tr>
<tr>
<td>Jian Zhang and Guang-Zhou Zeng</td>
<td></td>
</tr>
<tr>
<td>Decision Support Systems</td>
<td></td>
</tr>
<tr>
<td>A Bayesian-Based Decision-Making Process for IDM-T</td>
<td>197</td>
</tr>
<tr>
<td>Chunrong Gao and Kerong Ben</td>
<td></td>
</tr>
<tr>
<td>A Model for Fuzzy Multiple Attribute Group Decision Making and Fuzzy</td>
<td></td>
</tr>
<tr>
<td>Simulation Algorithm</td>
<td>201</td>
</tr>
<tr>
<td>Ling Zeng</td>
<td></td>
</tr>
<tr>
<td>Decision Support System of Fire Station Distribution and Responsible Area</td>
<td>206</td>
</tr>
<tr>
<td>Zoning in Nanjing, China</td>
<td></td>
</tr>
<tr>
<td>Xiang Zhang, Jian-gang Xu, and Yi Qi</td>
<td></td>
</tr>
<tr>
<td>Effect of Training Artificial Neural Networks on 2D Image: An Example</td>
<td></td>
</tr>
<tr>
<td>Study on Mammmography</td>
<td>214</td>
</tr>
<tr>
<td>Xuejun Zhang, Hiroshi Fujita, Jing Chen, and Zuojun Zhang</td>
<td></td>
</tr>
<tr>
<td>Multi-level Grey Evaluation for Competence of Knowledge Worker</td>
<td>219</td>
</tr>
<tr>
<td>Jingfang Liu, Ping Zou, Pengzhu Zhang, and Zhaqing Jia</td>
<td></td>
</tr>
<tr>
<td>Novel Data Processing Mechanism of Grey Control Model</td>
<td>224</td>
</tr>
<tr>
<td>Cheng Wang and Wenlue Chen</td>
<td></td>
</tr>
<tr>
<td>Pricing Model of Higher Education Tuition Based on Multivariate Linear</td>
<td>228</td>
</tr>
<tr>
<td>Congjun Rao and Huanbin Liu</td>
<td></td>
</tr>
<tr>
<td>Research on Multi-criterion Group Decision Making Cases Based Reasoning</td>
<td>232</td>
</tr>
<tr>
<td>Xinqiao Yu, Wenfei Chen, and Bo Meng</td>
<td></td>
</tr>
<tr>
<td>Research on Ontology-Based Case Indexing in CBR</td>
<td>238</td>
</tr>
<tr>
<td>Dong Wang, Yang Xiang, Guobing Zou, and Bo Zhang</td>
<td></td>
</tr>
<tr>
<td>Research on WLMS-Oriented Fuzzy Clustering Method and its Application</td>
<td>242</td>
</tr>
<tr>
<td>Renwang Li, Gui Yang, Zefei Zhu, Zhiyu Zhou, and Hao Luo</td>
<td></td>
</tr>
<tr>
<td>Resource Selection Game with Cost Constraint Oriented to Microeconomic</td>
<td>247</td>
</tr>
<tr>
<td>Data Mining</td>
<td></td>
</tr>
<tr>
<td>Jin Li, WeiYi Liu, and Kun Yue</td>
<td></td>
</tr>
<tr>
<td>Data Mining and Knowledge Discovering</td>
<td></td>
</tr>
<tr>
<td>A Framework for Video Event Detection Using Weighted SVM Classifiers</td>
<td>255</td>
</tr>
<tr>
<td>Jianjiang Lu, Yulong Tian, Yang Li, Yafei Zhang, and Zining Lu</td>
<td></td>
</tr>
<tr>
<td>A Grid and Density Based Fast Spatial Clustering Algorithm</td>
<td>260</td>
</tr>
<tr>
<td>Ming Huang and Fuling Bian</td>
<td></td>
</tr>
<tr>
<td>A New Algorithm for Clustering Based on Particle Swarm Optimization</td>
<td>264</td>
</tr>
<tr>
<td>and K-means</td>
<td></td>
</tr>
<tr>
<td>Jinxin Dong and Minyong Qi</td>
<td></td>
</tr>
</tbody>
</table>
A New Method of Periods’ Identification in Hydrologic Series Based on EEMD .................................................................269
Yan-Fang Sang, Dong Wang, Ji-Chun Wu, Qing-Ping Zhu, and Ling Wang

A New Method of Using Contextual Information to Infer the Semantic Orientations of Context Dependent Opinions ...............................................................274
Chunxu Wu, Lingfeng Shen, and Xuan Wang

A Novel Clustering Algorithm for Graphs .................................................................279
Dongming Chen

A Novel Fast Clustering Algorithm ........................................................................284
Xia Li, Sheng-Yi Jiang, and Xiao-Ke Su

A Novel Tree Cluster Approach Based on Least Closed Tree .......................................289
Xin Guo, Yun Li, Yunhao Yuan, Jia Wu, and Ling Chen

A Privacy-Preserving Distributed Method for Mining Association Rules .................294
Qiong Gui and Xiao-hui Cheng

A Spatial Clustering Algorithm Based on Spatial Topological Relations for GML Data ...........................................................298
Genlin Ji, Jianxin Miao, and Peiming Bao

An Approach for Analyzing Infrequent Software Faults Based on Outlier Detection .................................................................................................................302
Jiadong Ren, Qunhui Wu, Changzhen Hu, and Kunsheng Wang

An Improved Perceptron Tree Learning Model Based Intrusion Detection Approach ................................................................................................................307
Qinzhen Xu, Zhimao Bai, and Luxi Yang

An Improved Top-Down Data Mining Algorithm for Long Frequents ......................312
Gang Fang, Yu-Lu Liu, Jiang Xiong, and Hong Ying

Data Mining for the Analytical Redundancy of Power Plant Critical Parameters .................................................................................................................317
Tao Jin, Zhongguang Fu, Gang Liu, and Yongping Yang

Discovery Algorithm for Mining both Direct and Indirect Weighted Association Rules .................................................................................................................322
Weimin Ouyang and Qinhua Huang

Feature Selection with Discrete Binary Differential Evolution ..................................327
Xingshi He, Qingqing Zhang, Na Sun, and Yan Dong

Fining Frequent Itemsets from Uncertain Transaction Streams ..................................331
Bo Li

Frequent Items Mining on Data Stream Based on Time Fading Factor ......................336
Shan Zhang, Ling Chen, and Li Tu

Immune Optimization Based Genetic Algorithm for Incremental Association Rules Mining ....................................................................................................341
Genxiang Zhang and Haishan Chen
Integrated Study in Incomplete Information System ......................................................................................... 346
   Rui Zhang
Learning Naive Bayes Classifiers with Incomplete Data ...................................................................................... 350
   Cuiping Leng, Shuangcheng Wang, and Hui Wang
Manufacturing Knowledge Subject Mining and Ranking for Mass Customization ...................................................... 354
   Xinsheing Xu, Xin Cheng, and Zhengxiang Li
Mining Concept-Drifting and Noisy Data Streams Using Ensemble Classifiers ...................................................... 360
   Zhenzheng Ouyang, Min Zhou, Tao Wang, and Quanyuan Wu
Multiple-Step Rule Discovery for Associative Classification ....................................................................................... 365
   Tien Dung Do, Siu Cheung Hui, and Alvis C.M. Fong
Multi-relational Classification Based on the Contribution of Tables ............................................................................. 370
   Yun Li, Luan Luan, Yan Sheng, and Yunhao Yuan
Reckon the Parameter of DBSCAN for Multi-density Data Sets with Constraints .................................................. 375
   Tian-qiang Huang, Yang-qiang Yu, Kai Li, and Wen-fu Zeng
Study on Comparison of Discretization Methods ....................................................................................................... 380
   Liu Peng, Wang Qing, and Gu Yujia
Study on Data Mining in First Period of Jiangzhai Site Based on the Association Algorithms ........................................... 385
   Shuoben Bi, Yin Xu, Feng Jiao, Guonian Lü, and Anping Pei
Study on the Improvement of K-Nearest-Neighbor Algorithm ............................................................................... 390
   Bo Sun, Junping Du, and Tian Gao

Automatic Programming
An Algorithm of Tool-Path Optimization for High-Speed Machining
Deep-Cavity Precision Forging Die ................................................................................................................................. 397
   Q.P. Sun, Q.L. Chen, Q.F. Wang, and W.H. Liao
The Combination Forecasting Model for Power Load Based on Evidential Theory ...................................................... 402
   Dongxiao Niu, Bingen Kou, and Ye Chu

Automated Problem Solving
Concurrency and Collision Workflow Model Based on Petri Net in Electric Power Monitoring System .................. 409
   Weicheng Xie and Yi Xie
Map Polygon-Polygon Objects Spatial Conflicts Solution Using Simulated Annealing .............................................. 414
   Youliang Chen and Zhaoru Wang
Research on Coordination Platform for Distributed Manufacturers Using Multi-agent .................................................. 418
   Pengcheng Su, Guihe Wang, Wanshan Wang, and Ying Liu
The Control Theory and Implementation Method of Clamping Force on Metal Belt CVT ................................................................................................................................................................... 422
Lei Zhang, Huiwu Li, and Guoning Li

Applications of Artificial Intelligence

A Batch Dyeing Machine’s Controller Based on Embedded System .............................................................. 429
Jianxin Zhang, Zhiyu Zhou, and Zhen Zhang
A Novel Longitudinal Speed Estimator for Fully Automation Ground Vehicle on Cornering Maneuver .......................................................................................................................................... 433
Guanyu Wang and Shengbo Li
Application and Development of Artificial Intelligence Technology for the Data Management and Analysis in Forestry ............................................................................................................................................................................ 438
Wei-Zhan Guo, Liu-Jin Hao, and Wu-Jia Di
Application of Artificial Intelligence (AI) in Power Transformer Fault Diagnosis ............................................................. 442
Qi-Ping Yang, Meng-Qun Li, Xue-Yun Mu, and Jun Wang
Augmented LQG Optimal Control of Dynamic Performance for ETG System .......................................................... 446
Gui-chen Zhang
Bilevel Programming Model for Optimal Number and Scale of Coal Mining Companies ........................................................................................................................................................................... 451
Deyin Wang, Kejun Zhu, and Guangmin Wang
Complex Network Study of Yantai Tourism Industry ....................................................................................... 454
Jun-yi Ren
Design and Implementation of the Emotional Pedagogical Agent .................................................................. 459
Xuejing Gu, Zhihong Wang, Siyi Zheng, and Wei Wang
Diagnosis of Transformer Dissolved Gas Analysis Based on Multi-class SVM ................................................. 463
Zhe Zhang, Yong-Li Zhu, Zhong-Li Wu, and Kai Han
Distributed Intelligent Maintenance System for CNC Machine Tools Based on Kansei Engineering ..................... 467
Yang Yong and Wen Shan
Feature Extraction Combining PCA and Immune Clonal Selection for Hyperspectral Remote Sensing Image Classification ........................................................................................................................................................... 472
Xiangrong Zhang, Runxin Li, and Licheng Jiao
Fuzzy Multi-objective Programming Approach to Hazard Materials Treatment Center Location .................................................. 477
Wenqiang Dai and Qian Huang
Hopf Bifurcation in a Delayed Predator-Prey Model with a Holling-Type IV Functional Response ..................... 482
Huaxiang Liu
Improved on Maximum Intensity Projection ........................................................................................................ 491
Feng Ling and Ling Yang
Intelligent Visual Surveillance System Based on DSP ................................................................. 496
   Shu-man Zheng, Qing Guan, Sheng Xu, and Ying Li
Modeling a Complex Socioeconomic Systems Using Multi-agent Platform ........................................ 501
   Minhua Zhao, Junqi Yu, and Guanghua Zhao
Multisource Traffic Data Fusion with Entropy Based Method .......................................................... 506
   Zhanquan Sun, Mu Guo, Wei Liu, Jinqiao Feng, and Jiaxing Hu
Opportunities for AI in Intelligent Web-Based Technology-Supported Learning ................................ 510
   Carsten Ullrich, Jian Wang, Ruimin Shen, and Frank Quosdorf
Optimal Reliability Allocation for Modular Software Systems Basis on Support Vector Clustering and Fuzzy Decision ........................................................................................................... 515
   Yi Wan and Chengwen Wu
Power Transformer Condition Monitoring Based on MAS ................................................................. 520
   Guping Zheng and Fugui Dai
Refreezing Process of Ground for Concrete Pile Group Foundation with Hydration Heat in Cold Regions ......................................................................................................................... 524
   Yaping Wu, Chunxiang Guo, Yanfeng Zhu, and Xiaojun Wang
Strategy Analysis of the Management of Natural Resources and the Urban-Heat Island Effect Using a Fuzzy Analytic Hierarchy Process in the Miaoli County of Taiwan ........................................................................................................ 529
   Kuei-Yang Wu, Hong-Di Huang, and Wei-Cheng Chao
Study and Realization of Multimedia Intelligent Tourism Navigation System ........................................ 534
   Tian Gao, Junping Du, and Su Wang
Study on ARM-Based Embedded NC System ..................................................................................... 538
   Jun Wang
Study on Bidding Schemes and Decision-Making Method for Power Plant in Day-Ahead Power Market .......................................................................................................................... 545
   Zhongxiong Yuan and Danzhen Gu
Study on the Spatial Variability of Farmland Soil Nutrient Based on the Kriging Interpolation ................................................................................................................................. 550
   Hongbo Zheng, Jianping Wu, and Shan Zhang
Study on Tourism Video Active Service System ................................................................................ 556
   Baozeng Wang, Junping Du, and Tian Gao
Study on Travel Route Intelligent Navigation System Based on WEBGIS ........................................ 560
   Jun Lin, Junping Du, and Su Wang
The Application of Self Immune Genetic Arithmetic in Fault Diagnose of Electric System ................................. 565
   Shurong Liu and Xingping Meng
The Performance Improvements of an Active Suspension with Grey-Fuzzy Algorithm Employing Passenger Car ...................................................................................................................... 570
   Chien-Yu Ji and Jui-Chun Chang
Transformer Oil Dissolved Gas Concentration Prediction Based on Genetic Algorithm and Improved Gray Verhulst Model ................................................................. 575
   Rui-rui Zheng, Ji-yin Zhao, and Bao-chun Wu

Brain Actuated Interaction: An Application of BCI ........................................... 580
   Rajesh Singla and Bhupender Singh

A Web-Based Intelligent Tutoring System for English Dictation ............................ 583
   Xuechen He

A Method for 2D Image Texture Synthesis Based on LBP ................................... 587
   ZhaoHui Zhang, YuKun Yan, RuiQing Chen, and HuiQing Cui

Application of Gray Analytic Hierarchy Process in Project Risk Evaluation ............ 592
   Dong-hong Cui and Xi-yan Zhang

On the Functional Equation for the Hurwitz Zeta-function .................................. 595
   Ming-shun Yang

Spatial Data Mining on Cultural Stratum for Field Archaeology Based on Geography Information System Databases ................................................................. 598
   Shuoben Bi, Xiaoqing He, Feng Jiao, Guonian Lü, and Anping Pei

The Application of the Least Square Method in Back Analysis of 3D Initial Geostress ................................................................. 603
   Chun-mei Zheng, Wei-shen Zhu, and Guo-fu Sun

Application of Simulated Annealing Particle Swarm Algorithm in Optimal Scheduling of Hydropower Plant ................................................................. 608
   Li Bin and Rui Jun

Author Index - Volume 4 ............................................................................................. 611