Preface

This book and its sister volumes constitute the proceedings of the 2nd International Symposium on Neural Networks (ISNN 2005). ISNN 2005 was held in the beautiful mountain city Chongqing by the upper Yangtze River in southwestern China during May 30–June 1, 2005, as a sequel of ISNN 2004 successfully held in Dalian, China. ISNN emerged as a leading conference on neural computation in the region with increasing global recognition and impact. ISNN 2005 received 1425 submissions from authors on five continents (Asia, Europe, North America, South America, and Oceania), 33 countries and regions (Mainland China, Hong Kong, Macao, Taiwan, South Korea, Japan, Singapore, Thailand, India, Nepal, Iran, Qatar, United Arab Emirates, Turkey, Lithuania, Hungary, Poland, Austria, Switzerland, Germany, France, Sweden, Norway, Spain, Portugal, UK, USA, Canada, Venezuela, Brazil, Chile, Australia, and New Zealand). Based on rigorous reviews, 483 high-quality papers were selected by the Program Committee for presentation at ISNN 2005 and publication in the proceedings, with an acceptance rate of less than 34%. In addition to the numerous contributed papers, 10 distinguished scholars were invited to give plenary speeches and tutorials at ISNN 2005.

The papers are organized into many topical sections under 20 coherent categories (theoretical analysis, model design, learning methods, optimization methods, kernel methods, component analysis, pattern analysis, signal processing, image processing, financial analysis, system modeling, control systems, robotic systems, telecommunication networks, incidence detection, fault diagnosis, power systems, biomedical applications, and industrial applications, and other applications) spanning all major facets of neural network research and applications. ISNN 2005 provided an international forum for the participants to disseminate new research findings and discuss the state of the art. It also created a pleasant opportunity for the participants to interact and exchange information on emerging areas and future challenges of neural network research.

Many people made significant efforts to ensure the success of this event. The ISNN 2005 organizers are grateful to Chongqing University, Southwest Normal University, Chongqing University of Posts and Telecommunications, Southwest Agricultural University, and Chongqing Education College for their sponsorship; grateful to the National Natural Science Foundation of China for the financial support; and to the Asia Pacific Neural Network Assembly, the European Neural Network Society, the IEEE Computational Intelligence Society, and the IEEE Circuits and Systems Society for their technical co-sponsorship. The organizers would like to thank the members of the Advisory Committee for their spiritual support, the members of the Program Committee for reviewing the papers, and the members of the Publication Committee for checking the papers. The organizers would particularly like to thank the publisher, Springer, for their cooperation in publishing the proceedings as three volumes of the Lecture Notes.
in Computer Science series. Last but not least, the organizers would like to thank all
the authors for contributing their papers to ISNN 2005. Their enthusiastic contributions
and participation were essential parts of the symposium with which the organizers were
proud to be involved.

May 2005

Jun Wang
Xiaofeng Liao
Zhang Yi
ISNN 2005 Organization

ISNN 2005 was organized and sponsored by Chongqing University, Southwest Normal University, Chongqing University of Posts and Telecommunications, Southwest Agricultural University, and Chongqing Education College in cooperation with the Chinese University of Hong Kong. It was technically cosponsored by the Asia Pacific Neural Network Assembly, the European Neural Network Society, the IEEE Circuits and Systems Society, and the IEEE Computational Intelligence Society. It was financially supported by the National Natural Science Foundation of China and K.C. Wong Education Foundation of Hong Kong.

General Chair

Jun Wang, Hong Kong, China

Advisory Committee Co-chairs

Shun-ichi Amari, Tokyo, Japan  Jacek M. Zurada, Louisville, USA

Advisory Committee Members

Zheng Bao, X’ian, China  Guoliang Chen, Hefei, China
Ruwei Dai, Beijing, China  Chunbo Feng, Nanjing, China
Walter J. Freeman, Berkeley, USA  Toshio Fukuda, Nagoya, Japan
Kunihiko Fukushima, Tokyo, Japan  Aike Guo, Shanghai, China
Zhenya He, Nanjing, China  Okyay Kaynak, Istanbul, Turkey
Frank L. Lewis, Fort Worth, USA  Yanda Li, Beijing, China
Erkki Oja, Helsinki, Finland  Tzyh-Jong Tarn, St. Louis, USA
Shoujue Wang, Beijing, China  Youshou Wu, Beijing, China
Bo Zhang, Beijing, China  Nanning Zheng, Xi’an, China

Steering Committee Chairs

Xiaohong Li, Chongqing, China  Yixin Zhong, Beijing, China

Steering Committee Members

Wlodzislaw Duch, Torun, Poland  Yinguo Li, Chongqing, China
Max Q.H. Meng, Hong Kong, China  Marios M. Polycarpou, Cincinnati, USA
Yuhui Qiu, Chongqing, China  Zhengqi Sun, Beijing, China
DeLiang Wang, Columbus, USA  Zhongfu Wu, Chongqing, China
Zongben Xu, Xi’an, China  Gary G. Yen, Stillwater, USA
Fuliang Yin, Dalian, China  Juebang Yu, Chengdu, China
Program Committee Co-chairs

Xiaofeng Liao, Chongqing, China
Zhang Yi, Chengdu, China

Program Committee Members

Shigeo Abe, Kobe, Japan
Amit Bhaya, Rio de Janeiro, Brazil
Jinde Cao, Nanjing, China
Ke Chen, Manchester, UK
Tianping Chen, Shanghai, China
Yiu Ming Cheung, Hong Kong, China
Hyungsuk Cho, Dae Jeon, Korea
Shuang Cong, Hefei, China
Meng Joo Er, Singapore
Jun Gao, Hefei, China
Ping Guo, Beijing, China
Baogang Hu, Beijing, China
Jinglu Hu, Fukuoka, Japan
Licheng Jiao, Xi’an, China
Hon Keung Kwan, Windsor, Canada
Cees van Leeuwen, Tokyo, Japan
Yangmin Li, Macau, China
Yanchun Liang, Changchun, China
Chin-Teng Lin, Hsinchu, Taiwan
Qing Liu, Wuhan, China
Hongtao Lu, Shanghai, China
Zhiwei Luo, Nagoya, Japan
Satoshi Matsuda, Narashino, Japan
Stanislaw Osowski, Warsaw, Poland
Rudy Setiono, Singapore
Daming Shi, Singapore
Jianbo Su, Shanghai, China
Fuchun Sun, Beijing, China
Johan Suykens, Leuven, Belgium
Ying Tan, Hefei, China
Lipo Wang, Singapore
Wei Wu, Dalian, China
Hong Yan, Hong Kong, China
Wen Yu, Mexico City, Mexico
Huaguang Zhang, Shenyang, China
Liqing Zhang, Shanghai, China
Shu-Li Chen, Hsinchu, Taiwan
Yen-Wei Chen, Osaka, Japan
Laiwan Chan, Hong Kong, China
Laiyan Chan, Hong Kong, China
Luonan Chen, Osaka, Japan
Yin Chen, Shanghai, China
Zheru Chi, Hong Kong, China
Andrzej Cichocki, Tokyo, Japan
Chuanyin Dang, Hong Kong, China
Mauro Forti, Siena, Italy
Chengan Guo, Dalian, China
Zengguang Hou, Beijing, China
Yuanqing Li, Singapore
Yuanqing Li, Singapore
Dewen Hu, Changsha, China
Danchi Jiang, Hobart, Australia
Nikola Kasabov, Auckland, New Zealand
Irwin King, Hong Kong, China
Fulong Luo, San Jose, USA
Fa-Long Luo, San Jose, USA
Qing Ma, Kyoto, Japan
Tetsuo Nishi, Fukuoka, Japan
Paul S. Pang, Auckland, New Zealand
Yi Shen, Wuhan, China
Peter Sincak, Kosice, Slovakia
Changyin Sun, Nanjing, China
Ron Sun, Troy, USA
Ah Hwee Tan, Singapore
Dan Wang, Singapore
Wanliang Wang, Hangzhou, China
Michel Verleysen, Louvain, Belgium
Mao Ye, Chengdu, China
Zhigang Zeng, Hefei, China
Liming Zhang, Shanghai, China
Chunguang Zhou, Changchun, China

Special Sessions Chair

Derong Liu, Chicago, USA
Organizing Chairs

Guoyin Wang, Chongqing, China

Simon X. Yang, Guelph, Canada

Finance Chairs

Guangyuan Liu, Chongqing, China

Qingyu Xiong, Chongqing, China

Yu Wu, Chongqing, China

Publication Co-chairs

Yi Chai, Chongqing, China

Hujun Yin, Manchester, UK

Jianwei Zhang, Hamburg, Germany

Publicity Co-chairs

Min Han, Dalian, China

Fengchun Tian, Chongqing, China

Registration Chairs

Yi Chai, Chongqing, China

Shaojiang Deng, Chongqing, China

Local Arrangements Chairs

Wei Zhang, Chongqing, China

Jianqiao Yu, Chongqing, China

Secretariat and Webmaster

Tao Xiang, Chongqing, China
# Table of Contents, Part II

## 7 Pattern Analysis

<table>
<thead>
<tr>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A New Approach for Classification: Visual Simulation Point of View</td>
<td>1</td>
</tr>
<tr>
<td>Zongben Xu, Deyu Meng, and Wenfeng Jing</td>
<td></td>
</tr>
<tr>
<td>A Novel Classifier with the Immune-Training Based Wavelet Neural Network</td>
<td>8</td>
</tr>
<tr>
<td>Lei Wang, Yinling Nie, Weike Nie, and Licheng Jiao</td>
<td></td>
</tr>
<tr>
<td>Fisher Subspace Tree Classifier Based on Neural Networks</td>
<td>14</td>
</tr>
<tr>
<td>Dongyue Chen, Xiaodan Lu, and Liming Zhang</td>
<td></td>
</tr>
<tr>
<td>Classification Algorithms Based on Fisher Discriminant and Perceptron Neural Network</td>
<td>20</td>
</tr>
<tr>
<td>Hu Yang and Jianwen Xu</td>
<td></td>
</tr>
<tr>
<td>Robust Classification of Immunity Clonal Synergetic Network Inspired</td>
<td>26</td>
</tr>
<tr>
<td>by Fuzzy Integral</td>
<td></td>
</tr>
<tr>
<td>Xiuli Ma, Shuang Wang, and Licheng Jiao</td>
<td></td>
</tr>
<tr>
<td>An Improved Optimal Pairwise Coupling Classifier</td>
<td>32</td>
</tr>
<tr>
<td>Roger Xu, Tao Qian, and Chiman Kwan</td>
<td></td>
</tr>
<tr>
<td>Improvement on Response Performance of Min-Max Modular Classifier by Symmetric Module Selection</td>
<td>39</td>
</tr>
<tr>
<td>Hai Zhao and Baoliang Lu</td>
<td></td>
</tr>
<tr>
<td>Principle for Outputs of Hidden Neurons in CC4 Network</td>
<td>45</td>
</tr>
<tr>
<td>Zhenya Zhang, Shuguang Zhang, Xufa Wang, Shuangping Chen, and Hongmei Cheng</td>
<td></td>
</tr>
<tr>
<td>Chunk Incremental LDA Computing on Data Streams</td>
<td>51</td>
</tr>
<tr>
<td>Shaoning Pang, Seiichi Ozawa, and Nikola Kasabov</td>
<td></td>
</tr>
<tr>
<td>A Novel Clustering Method Based on SVM</td>
<td>57</td>
</tr>
<tr>
<td>Jie Li, Xinbo Gao, and Licheng Jiao</td>
<td></td>
</tr>
<tr>
<td>Clustering High-Dimensional Data Using Growing SOM</td>
<td>63</td>
</tr>
<tr>
<td>Junlin Zhou and Yan Fu</td>
<td></td>
</tr>
<tr>
<td>A Novel Clustering Algorithm Based upon a SOFM Neural Network Family</td>
<td>69</td>
</tr>
<tr>
<td>Junhao Wen, Kaiwen Meng, Hongyan Wu, and Zhongfu Wu</td>
<td></td>
</tr>
</tbody>
</table>
Advanced Visualization Techniques for Self-organizing Maps
with Graph-Based Methods ........................................... 75
Georg Pölzlbaumer, Andreas Rauber, and Michael Dittenbach

Selection of Optimal Features for Iris Recognition ................. 81
Hongying Gu, Zhiwen Gao, and Fei Wu

Application of Multi-weighted Neuron for Iris Recognition .......... 87
Wenming Cao, Jianhui Hu, Gang Xiao, and Shoujue Wang

Robust Precise Eye Location by Adaboost and SVM Techniques ........ 93
Xusheng Tang, Zongying Ou, Tieming Su, Haibo Sun, and Pengfei Zhao

Classification-Based Face Detection Using Compound Features .... 99
Linlin Huang, Akinobu Shimizu, and Hidefumi Kobatake

Face Recognition Using RBF Neural Networks and Wavelet Transform ....... 105
Bicheng Li and Hujun Yin

Face Recognition Using Fisher Non-negative Matrix Factorization
with Sparseness Constraints ........................................... 112
Xiaorong Pu, Zhang Yi, Ziming Zheng, Wei Zhou, and Mao Ye

Gabor Features-Based Classification Using SVM for Face Recognition .... 118
Yixiong Liang, Weiguo Gong, Yingjun Pan, Weihong Li, and Zhenjiang Hu

An Experimental Evaluation of Linear and Kernel-Based Classifiers
for Face Recognition .................................................. 124
Congde Lu, Taiyi Zhang, Wei Zhang, and Guang Yang

A Study on Illumination Invariant Face Recognition Methods
Based on Multiple Eigenspaces ....................................... 131
Wujun Li, Chongjun Wang, Dianjiang Xu, Bin Luo, and Zhaojian Chen

Boosted Independent Features for Face Expression Recognition ........ 137
Lianghua He, Jianzhong Zhou, Die Hu, Cairong Zou, and Li Zhao

Intelligent Immigration Control System by Using Passport Recognition
and Face Verification .................................................. 147
Kwangbaek Kim

Recognition of Finger Spelling of American Sign Language with
Artificial Neural Network Using Position/Orientation Sensors and Data Glove . . . 157
Cemil Oz and Ming C. Leu

Fingerprint Minutia Recognition with Fuzzy Neural Network ............. 165
Guang Yang, Daming Shi, and Chai Quek

Fingerprint Classification Based on Curvature Sampling
and RBF Neural Networks ............................................ 171
Xuchu Wang, Jianwei Li, and Yanmin Niu
Palmprint Recognition Based on Translation Invariant Zernike Moments ................................. 177
  Yanlai Li, Kuanquan Wang, and David Zhang

Gait Recognition Using Independent Component Analysis ............................. 183
  Jiwen Lu, Erhu Zhang, Zhigang Zhang, and Yanxue Xue

Nighttime Pedestrian Detection with a Normal Camera Using SVM Classifier . . . 189
  Qiming Tian, Hui Sun, Yupin Luo, and Dongcheng Hu

Signature Recognition and Verification with Artificial Neural Network
Using Moment Invariant Method .......................................................... 195
  Cemil Oz

Handwritten Digit Recognition with Kernel-Based LVQ Classifier
in Input Space ....................................................................................... 203
  Hairong Lv and Wenyuan Wang

Recognition of English Business Cards Using Enhanced Hybrid Network . . . . 209
  Kwangbaek Kim, Jaehyun Cho, and Amsuk Oh

A Novel Approach for License Plate Recognition Using Subspace Projection
and Probabilistic Neural Network .......................................................... 216
  Yafeng Hu, Feng Zhu, and Xianda Zhang

Automatic Authentication Technique Based on Supervised ART-2
and Polynomial Spline Pyramid Algorithm ............................................. 222
  Ning Chen, Boqin Feng, Haixiao Wang, and Hao Zhang

Neural Network Based Online Feature Selection for Vehicle Tracking ............. 226
  Tie Liu, Nanning Zheng, and Hong Cheng

TextCC: New Feed Forward Neural Network
for Classifying Documents Instantly ......................................................... 232
  Zhenya Zhang, Shuguang Zhang, Enhong Chen, Xufa Wang,
  and Hongmei Cheng

A Neural Network Model for Hierarchical Multilingual Text Categorization ..... 238
  Rowena Chau, Chungsing Yeh, and Kate A. Smith

Chinese Syntactic Category Disambiguation Using Support Vector Machines ..... 246
  Lishuang Li, Lihua Li, Degen Huang, and Heping Song

A Clustering Algorithm for Chinese Text
Based on SOM Neural Network and Density ............................................. 251
  Zhiqing Meng, Hongcan Zhu, Yihua Zhu, and Gengui Zhou

Automatic Caption Detection in Video Frames
Based on Support Vector Machine ........................................................... 257
  Jianfeng Xu and Shaofa Li
Selection of ICA Features for Texture Classification ........................................ 262  
Xiangyan Zeng, Yenwei Chen, Deborah van Alphen, and Zensho Nakao

Feature Selection and Fusion for Texture Classification ............................... 268  
Shutao Li and Yaonan Wang

Scene Classification Using Adaptive Processing of Tree Representation of Rectangular-Shape Partition of Images ......................................................... 274  
Wei Sun, Ken Lo, and Zheru Chi

Shape Recognition Based on Radial Basis Probabilistic Neural Network and Application to Plant Species Identification ............................................. 281  
Jixiang Du, Deshuang Huang, Xiaofeng Wang, and Xiao Gu

Image Recognition Using Synergetic Neural Network ................................... 286  
Shuiping Gou and Licheng Jiao

Content Based Retrieval and Classification of Cultural Relic Images ............... 292  
Na Wei, M. Emre Celebi, and Guohua Geng

Obscene Image Recognition Based on Model Matching and BWFNN ............... 298  
Xiaohua Liu, Zhezhou Yu, Libiao Zhang, Miao Liu, Chenguang Zhou, Chunxia Li, Catitang Sun, and Li Zhang

Classification of SAR Imagery Using Multiscale Self-organizing Network ...... 304  
Xianbin Wen

Mixture of Experts for Stellar Data Classification .......................................... 310  
Yugang Jiang and Ping Guo

A Neural Network Model for Extraction of Salient Contours .......................... 316  
Qiling Tang, Nong Sang, and Tianxu Zhang

A Mechanism for Extracting Optical Virtual Contours of Discrete Dot Stimuli . 321  
Eunhwa Jeong and Keongho Hong

Using Self-organizing Map for Mental Tasks Classification in Brain-Computer Interface ................................................................. 327  
Hailong Liu, Jue Wang, and Chongxun Zheng

Speech Recognition Using Stereo Vision Neural Networks with Competition and Cooperation ................................................................. 333  
Sung-III Kim

Speech Recognition of Finite Words Based on Multi-weight Neural Network .... 339  
Yan Wu, Hongbo Wang, Mingxi Jin, and Shoujue Wang

Continuous Speech Research Based on Two-Weight Neural Network .............. 345  
Wenming Cao, Xiaoxia Pan, and Shoujue Wang
Table of Contents, Part II XV

Two-Domain Feature Compensation for Robust Speech Recognition .............. 351
*Haifeng Shen, Gang Liu, Jun Guo, and Qunxia Li*

On Kernel Discriminant Analyses Applied to Phoneme Classification ............ 357
*András Kocsor*

Automatic News Audio Classification Based on Selective Ensemble SVMs ....... 363
*Bing Han, Xinbo Gao, and Hongbing Ji*

A Compound Statistical Model Based Radar HRRP Target Recognition .......... 369
*Lan Du, Hongwei Liu, Zheng Bao, and Junying Zhang*

A Radar Target Multi-feature Fusion Classifier
Based on Rough Neural Network ............................................. 375
*Yinshui Shi, Hongbing Ji, and Xinbo Gao*

Automatic Digital Modulation Recognition Based on ART2A-DWNN ............ 381
*Zhilu Wu, Xuexia Wang, Cuiyan Liu, and Guanghui Ren*

Recognition of Radiated Noises of Ships Using Auditory Features
and Support Vector Machines .................................................. 387
*Xinhua Zhang, Chunyu Kang, and Zhijun Xia*

Feature Selection and Identification of Underground Nuclear Explosion
and Natural Earthquake Based on Gamma Test and BP Neural Network ........ 393
*Daizhi Liu, Xihai Li, and Bin Zhang*

An Adaptive Neural Network Classifier for Tropical Cyclone Prediction
Using a Two-Layer Feature Selector ............................................ 399
*Bo Feng and James N.K. Liu*

Feature Point Matching of Affine Model Images Using Hopfield Network ....... 405
*Jinsi Tian and Jianbo Su*

8 System Modeling

Nonlinear System Modeling Using Wavelet Networks ............................ 411
*Seda Postalcioglu and Yasar Becerikli*

Robust Modeling for Nonlinear Dynamic Systems
Using a Neurofuzzy Approach with Iterative Optimization ....................... 418
*Shirong Liu, Simon X. Yang, and Jinshou Yu*

Modelling of Chaotic Systems with Recurrent Least Squares Support Vector
Machines Combined with Stationary Wavelet Transform ........................ 424
*Jiancheng Sun, Lun Yu, Guang Yang, and Congde Lu*

Adding Value to System Dynamics Modeling
by Using Artificial Neural Network .......................................... 430
*Changrui Ren, Yueting Chai, and Yi Liu*
Least Squares Wavelet Support Vector Machines for Nonlinear System Identification .............................................. 436
   Zhenhua Yu and Yuanli Cai

Wavelet Support Vector Machines and Its Application for Nonlinear System Identification .............................................. 442
   Xiangjun Wen, Yunze Cai, and Xiaoming Xu

Comparative Assessment of Interval and Affine Arithmetic in Neural Network State Prediction ...................................... 448
   Marcela Jamett and Gonzalo Acuña

Identification of Duffing’s Equation with Dynamic Recurrent Neural Network ......................................................... 454
   Shun Liang, Qin Zhu, and Mitsuaki Ishitobi

An Intelligent System for Dynamic System State Forecasting ................................................................. 460
   Wilson Wang

9 Signal Processing

Sequential Extraction Algorithm for BSS Without Error Accumulation ................................................................. 466
   Qiang Liu and Tianping Chen

A Learning Framework for Blind Source Separation Using Generalized Eigenvalues ................................................. 472
   Hailin Liu and Yiuming Cheung

Post-nonlinear Blind Source Separation Using Neural Networks with Sandwiched Structure ........................................ 478
   Chunhou Zheng, Deshuang Huang, Zhanli Sun, and Li Shang

A Novel Approach for Underdetermined Blind Sources Separation in Frequency Domain ............................................. 484
   Ming Xiao, Shengli Xie, and Yuli Fu

A Neural Network Blind Separation Method Based on Special Frequency Bins ......................................................... 490
   Anqing Zhang, Xuxiu Zhang, Tianshuang Qiu, and Xinhua Zhang

Application of Blind Source Separation to Time Delay Estimation in Interference Environments ................................ 496
   Gaoming Huang, Luxi Yang, and Zhenya He

Blind Identification and Deconvolution for Noisy Two-Input Two-Output Channels .................................................. 502
   Yuanqing Li, Andrzej Cichocki, and Jianzhao Qin

   Xiefeng Cheng, Yong Zhang, Zhiquan Feng, Ju Liu, and Huibo Hu
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability Analysis of Multichannel Blind Deconvolution</td>
<td>514</td>
</tr>
<tr>
<td>Bin Xia and Liqing Zhang</td>
<td></td>
</tr>
<tr>
<td>Joint Diagonalization of Power Spectral Density Matrices for Blind Source Separation of Convolutive Mixtures</td>
<td>520</td>
</tr>
<tr>
<td>Tiemin Mei, Jiangtao Xi, Fuliang Yin, and Joe F. Chicharo</td>
<td></td>
</tr>
<tr>
<td>A Block-Adaptive Subspace Method Using Oblique Projections for Blind Separation of Convolutive Mixtures</td>
<td>526</td>
</tr>
<tr>
<td>Chunyi Peng, Xianda Zhang, and Qutang Cai</td>
<td></td>
</tr>
<tr>
<td>FIR Convolutive BSS Based on Sparse Representation</td>
<td>532</td>
</tr>
<tr>
<td>Zhaoshui He, Shengli Xie, and Yuli Fu</td>
<td></td>
</tr>
<tr>
<td>Blind Separation Combined Frequency Invariant Beamforming and ICA for Far-field Broadband Acoustic Signals</td>
<td>538</td>
</tr>
<tr>
<td>Qi Lv, Xianda Zhang, and Ying Jia</td>
<td></td>
</tr>
<tr>
<td>Blind Source Separation-Based Encryption of Images and Speeches</td>
<td>544</td>
</tr>
<tr>
<td>Qiuhua Lin, Fuliang Yin, and Hualou Liang</td>
<td></td>
</tr>
<tr>
<td>A Digital Audio Watermarking Scheme Based on Blind Source Separation</td>
<td>550</td>
</tr>
<tr>
<td>Xiaohong Ma, Chong Wang, Xiangping Cong, and Fuliang Yin</td>
<td></td>
</tr>
<tr>
<td>Lidar Signal Processing for Under-water Object Detection</td>
<td>556</td>
</tr>
<tr>
<td>Vikramjit Mitra, Chiajiu Wang, and Satarupa Banerjee</td>
<td></td>
</tr>
<tr>
<td>Ultra-wideband Nearfield Adaptive Beamforming Based on a RBF Neural Network</td>
<td>562</td>
</tr>
<tr>
<td>Min Wang, Shuyuan Yang, and Shunjun Wu</td>
<td></td>
</tr>
<tr>
<td>Automatic Digital Modulation Recognition Using Support Vector Machines and Genetic Algorithm</td>
<td>568</td>
</tr>
<tr>
<td>Jie Li, Jing Peng, Heng Chu, and Weile Zhu</td>
<td></td>
</tr>
<tr>
<td>A Unified Framework for Synthesis of Cosine-Modulated Filter Banks and Corresponding Wavelets</td>
<td>574</td>
</tr>
<tr>
<td>Ying Tan</td>
<td></td>
</tr>
<tr>
<td>A Systematic Chaotic Noise Reduction Method Combining with Neural Network</td>
<td>580</td>
</tr>
<tr>
<td>Min Han, Yuhua Liu, Jianhui Xi, and Zhiwei Shi</td>
<td></td>
</tr>
<tr>
<td>A New Speech Enhancement Method for Adverse Noise Environment</td>
<td>586</td>
</tr>
<tr>
<td>Xiaohong Ma, Yu Wang, Wenlong Liu, and Fuliang Yin</td>
<td></td>
</tr>
<tr>
<td>A Subband Adaptive Learning Algorithm for Microphone Array Based Speech Enhancement</td>
<td>592</td>
</tr>
<tr>
<td>Dongxia Wang and Fuliang Yin</td>
<td></td>
</tr>
</tbody>
</table>
A Spiking Neuron Model of Auditory Neural Coding .......................... 598
  Guoping Wang and Misha Pavel

Blind Feature Extraction for Time-Series Classification
Using Haar Wavelet Transform ........................................... 605
  Hui Zhang, Tubao Ho, and Wei Huang

Prediction of Time Sequence
Using Recurrent Compensatory Neuro-fuzzy Systems .................... 611
  ChiYung Lee and ChengJian Lin

Study of Nonlinear Multivariate Time Series Prediction
Based on Neural Networks ............................................. 618
  Min Han, Mingming Fan, and Jianhui Xi

Improving Ability of Passive Attacks of Chaotic Encryption
by Using Neural Network ............................................. 624
  Xin Yang, Xiuye Huang, and Hanmin Huang

Chosen-Plaintext Cryptanalysis of a Clipped-Neural-Network-Based
Chaotic Cipher ......................................................... 630
  Chengqing Li, Shujun Li, Dan Zhang, and Guanrong Chen

A Novel Identity-Based Key Issuing Scheme
Based on Interacting Neural Network .................................. 637
  Tieming Chen, Bo Chen, and Jiamei Cai

The Projection Pursuit Learning Network
for Nonlinear Time Series Modeling and Forecasting .................. 643
  Zheng Tian, Zi Jin, Fang He, and Wei Ling

10 Image Processing

A New Scheme for Blind Decomposition of Mixed Pixels
Based on Non-negative Matrix Factorization ............................. 651
  Hao Zhou, Bin Wang, and Liming Zhang

Representing Image Matrices: Eigenimages Versus Eigenvectors ........ 659
  Daoqiang Zhang, Songcan Chen, and Jun Liu

A SIMD Neural Network Processor for Image Processing ................ 665
  Dongsun Kim, Hyunsik Kim, Hongsik Kim, Gunhee Han, and Duckjin Chung

MRF-MBNN: A Novel Neural Network Architecture for Image Processing 673
  Nian Cai, Jie Yang, Kuanghu Hu, and Haitao Xiong

Using LM Artificial Neural Networks and η-Closest-Pixels
for Impulsive Noise Suppression from Highly Corrupted Images ........ 679
  Pınar Çivicioğlu
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Novel Image Filters Based on Canonical Piecewise Linear Networks</td>
<td>685</td>
</tr>
<tr>
<td>Xusheng Sun, Shuning Wang, and Yuehong Wang</td>
<td></td>
</tr>
<tr>
<td>A New Effective and Powerful Image Segmentation Method</td>
<td>690</td>
</tr>
<tr>
<td>Yalin Miao, Xianglin Miao, Zhengzhong Bian, Kai Chen, and Gang Yu</td>
<td></td>
</tr>
<tr>
<td>A Novel Image Interpolator Based on Probabilistic Neural Network with Shapeness/Smoothness Adaptation</td>
<td>698</td>
</tr>
<tr>
<td>Chinghan Chen and Shenghsien Hsieh</td>
<td></td>
</tr>
<tr>
<td>Contrast Enhancement for Image with Simulated Annealing Algorithm and Wavelet Neural Network</td>
<td>707</td>
</tr>
<tr>
<td>Changjiang Zhang, Xiaodong Wang, and Haoran Zhang</td>
<td></td>
</tr>
<tr>
<td>Adaptive Constructive Neural Networks Using Hermite Polynomials for Image Compression</td>
<td>713</td>
</tr>
<tr>
<td>Liying Ma and Khashayar Khorasani</td>
<td></td>
</tr>
<tr>
<td>Compression of Remote Sensing Images Based on Ridgelet and Neural Network</td>
<td>723</td>
</tr>
<tr>
<td>Shuyuan Yang, Min Wang, and Licheng Jiao</td>
<td></td>
</tr>
<tr>
<td>The SAR Image Compression with Projection Pursuit Neural Networks</td>
<td>730</td>
</tr>
<tr>
<td>Jian Ji, Zheng Tian, Wei Lin, and Yanwei Ju</td>
<td></td>
</tr>
<tr>
<td>Image Restoration Using Hopfield Neural Network Based on Total Variational Model</td>
<td>735</td>
</tr>
<tr>
<td>Hongying Zhang, Yadong Wu, and Qicong Peng</td>
<td></td>
</tr>
<tr>
<td>Pulse Coupled Neural Network Based Image Fusion</td>
<td>741</td>
</tr>
<tr>
<td>Min Li, Wei Cai, and Zheng Tan</td>
<td></td>
</tr>
<tr>
<td>A Novel Image Fusion Method Based on SGNN</td>
<td>747</td>
</tr>
<tr>
<td>Zheng Qin, Fumin Bao, and Aiguo Li</td>
<td></td>
</tr>
<tr>
<td>Multifocus Image Fusion Using Spatial Features and Support Vector Machine</td>
<td>753</td>
</tr>
<tr>
<td>Shutao Li and Yaonan Wang</td>
<td></td>
</tr>
<tr>
<td>A New Scheme for Fusion of Multispectral and Panchromatic Images Based on Residual Error</td>
<td>759</td>
</tr>
<tr>
<td>Zhirong Ge, Bin Wang, and Liming Zhang</td>
<td></td>
</tr>
<tr>
<td>Binocular 3D Reconstruction Based on Neural Network</td>
<td>765</td>
</tr>
<tr>
<td>Mingxing Lin, Yongrui Zhao, Zhiguang Guan, Fenghua Ding, Qingxin Xu, and Xiaohua Wang</td>
<td></td>
</tr>
<tr>
<td>A Neural Network Based Lossless Digital Image Watermarking in the Spatial Domain</td>
<td>772</td>
</tr>
<tr>
<td>Jun Sang and Mohammad S. Alam</td>
<td></td>
</tr>
</tbody>
</table>
A Copy Attack Resilient Blind Watermarking Algorithm
Based on Independent Feature Components ........................................ 777
   Ju Liu, Huibo Hu, Jiande Sun, and Yu Huang

Watermarking Capacity Analysis Based on Neural Network ............... 783
   Fan Zhang and Hongbin Zhang

SVR-Based Oblivious Watermarking Scheme .................................. 789
   Yonggang Fu, Ruimin Shen, Hongtao Lu, and Xusheng Lei

An Audio Watermarking Scheme with Neural Network .................... 795
   Chong Wang, Xiaohong Ma, Xiangping Cong, and Fuliang Yin

Subsampling-Based Robust Watermarking Using Neural Network Detector .... 801
   Wei Lu, Hongtao Lu, and FuLai Chung

Image Feature Extraction Based on an Extended Non-negative Sparse
Coding Neural Network Model ...................................................... 807
   Li Shang, Deshuang Huang, Chunhou Zheng, and Zhanli Sun

Evolving Optimal Feature Set by Interactive Reinforcement Learning
for Image Retrieval .................................................................... 813
   Jianbo Su, Fang Liu, and Zhiwei Luo

Perception-Oriented Prominent Region Detection in Video Sequences
Using Fuzzy Inference Neural Network ........................................... 819
   Congyan Lang, De Xu, Xu Yang, Yiwei Jiang, and Wengang Cheng

The Application of Neural Network
and Wavelet in Human Face Illumination Compensation .................. 828
   Zhongbo Zhang, Siliang Ma, and Danyang Wu

Global Icons and Local Icons of Images Based Unit-Linking PCNN
and Their Application to Robot Navigation .................................... 836
   Xiaodong Gu and Liming Zhang

A Neural Model for Extracting Occluding Subjective Surfaces ........... 842
   Keongho Hong and Eunhwa Jeong

Hopfield Neural Network Image Matching Based on Hausdorff Distance
and Chaos Optimizing ............................................................... 848
   Zhenghao Shi, Yaning Feng, Linhua Zhang, and Shitan Huang

Neural Network Based Fairing of Digitized Curves and Its Application .... 854
   Jianhua Hou, Zongying Ou, and Mingen Guo

A Digital Image Encryption Scheme Based on the Hybrid
of Cellular Neural Network and Logistic Map .................................. 860
   Wei Zhang, Jun Peng, Huaqian Yang, and Pengcheng Wei
Image Encryption Scheme Based on Chaotic Neural System .................. 868
Shaojiang Deng, Linhua Zhang, and Di Xiao

11 Financial Analysis

Effectiveness of Different Target Coding Schemes on Networks
in Financial Engineering .......................................................... 873
Kidong Lee, Junghee Park, and Sangjae Lee

Select the Size of Training Set for Financial Forecasting with Neural Networks . . 879
Wei Huang, Yoshiteru Nakamori, Shouyang Wang, and Hui Zhang

Estimating the Yield Curve Using Calibrated Radial Basis Function Networks . . 885
Gyusik Han, Daewon Lee, and Jaewook Lee

Fast ICA for Online Cashflow Analysis ........................................ 891
Shangming Yang and Zhang Yi

Impacts of Internet Stock News on Stock Markets Based on Neural Networks . . 897
Xun Liang

Coherent Risk Measure Using Feedfoward Neural Networks .................... 904
Hyoseok Lee, Jaewook Lee, Younggui Yoon, and Sooyoung Kim

Application of Evidence Theory and Neural Network in Warning System
of Financial Risk ......................................................................... 910
Qingyu Xiong, Yinlin Huang, Shan Liang, Weiren Shi, Songsong Tan,
and Yinhua Lin

Novel Questionnaire-Responded Transaction Approach
with SVM for Credit Card Fraud Detection ..................................... 916
Rongchang Chen, Tungshou Chen, Yuer Chien, and Yuru Yang

Learning of Neural Networks for Fraud Detection
Based on a Partial Area Under Curve ............................................. 922
Lae-Jeong Park

Customer Churning Prediction Using Support Vector Machines
in Online Auto Insurance Service .................................................. 928
Yeon Hur and Sehun Lim

Author Index .............................................................................. 935
# Table of Contents, Part III

## 12 Control Systems

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>NN-Based Iterative Learning Control Under Resource Constraints:</td>
<td>1</td>
</tr>
<tr>
<td>A Feedback Scheduling Approach</td>
<td></td>
</tr>
<tr>
<td><em>Feng Xia and Youxian Sun</em></td>
<td></td>
</tr>
<tr>
<td>Sequential Support Vector Machine Control of Nonlinear Systems</td>
<td>7</td>
</tr>
<tr>
<td>by State Feedback</td>
<td></td>
</tr>
<tr>
<td><em>Zonghai Sun, Youxian Sun, Xuhua Yang, and Yongqiang Wang</em></td>
<td></td>
</tr>
<tr>
<td>RBFNN-Based Multiple Steady States Controller for Nonlinear System</td>
<td>15</td>
</tr>
<tr>
<td>and Its Application</td>
<td></td>
</tr>
<tr>
<td><em>Xiugai Li, Dexian Huang, and Yihui Jin</em></td>
<td></td>
</tr>
<tr>
<td>Sliding Mode Control for Uncertain Nonlinear Systems</td>
<td>21</td>
</tr>
<tr>
<td>Using RBF Neural Networks</td>
<td></td>
</tr>
<tr>
<td><em>Xu Zha and Pingyuan Cui</em></td>
<td></td>
</tr>
<tr>
<td>Adaptive Backstepping Neural Network Control</td>
<td>30</td>
</tr>
<tr>
<td>for Unknown Nonlinear Time-Delay Systems</td>
<td></td>
</tr>
<tr>
<td><em>Weisheng Chen and Junmin Li</em></td>
<td></td>
</tr>
<tr>
<td>Multiple Models Adaptive Control</td>
<td>36</td>
</tr>
<tr>
<td>Based on RBF Neural Network Dynamic Compensation</td>
<td></td>
</tr>
<tr>
<td><em>Junyong Zhai and Shumin Fei</em></td>
<td></td>
</tr>
<tr>
<td>Stability Analysis and Performance Evaluation of an Adaptive Neural</td>
<td>42</td>
</tr>
<tr>
<td>Controller</td>
<td></td>
</tr>
<tr>
<td><em>Dingguo Chen and Jiaben Yang</em></td>
<td></td>
</tr>
<tr>
<td>Adaptive Inverse Control System</td>
<td>48</td>
</tr>
<tr>
<td>Based on Least Squares Support Vector Machines</td>
<td></td>
</tr>
<tr>
<td><em>Xiaojing Liu, Jianqiang Yi, and Dongbin Zhao</em></td>
<td></td>
</tr>
<tr>
<td>H-Infinity Control for Switched Nonlinear Systems</td>
<td>54</td>
</tr>
<tr>
<td>Based on RBF Neural Networks</td>
<td></td>
</tr>
<tr>
<td><em>Fei Long, Shumin Fei, and Shiyou Zheng</em></td>
<td></td>
</tr>
<tr>
<td>Neural Networks Robust Adaptive Control for a Class of MIMO Uncertain</td>
<td>60</td>
</tr>
<tr>
<td>Nonlinear Systems</td>
<td></td>
</tr>
<tr>
<td><em>Tingliang Hu, Jihong Zhu, Chunhua Hu, and Zengqi Sun</em></td>
<td></td>
</tr>
</tbody>
</table>
Adaptive Critic for Controller Malfunction Accommodation .......................... 69
   Gary G. Yen

Output Based Fault Tolerant Control of Nonlinear Systems
Using RBF Neural Networks ....................................................... 79
   Min Wang and Donghua Zhou

Fault Tolerant Control of Nonlinear Processes
with Adaptive Diagonal Recurrent Neural Network Model .................... 86
   Ding-Li Yu, Thoonkhin Chang, and Jin Wang

Dealing with Fault Dynamics in Nonlinear Systems
via Double Neural Network Units ............................................ 92
   Yong D. Song, Xiao H. Liao, Cortney Bolden, and Zhi Yang

Neural Adaptive Singularity-Free Control by Backstepping
for Uncertain Nonlinear Systems ............................................. 98
   Zhandong Yu and Qingchao Wang

Parameter Estimation of Fuzzy Controller
Using Genetic Optimization and Neurofuzzy Networks .......................... 107
   Sungkwun Oh, Seokbeom Roh, and Taechon Ahn

A Fuzzy CMAC Controller with Eligibility ........................................ 113
   Zhipeng Shen, Chen Guo, Jianbo Sun, and Chenjun Shi

A Novel Intelligent Controller Based on Modulation of Neuroendocrine System . 119
   Bao Liu, Lihong Ren, and Yongsheng Ding

Batch-to-Batch Optimal Control Based on Support Vector Regression Model ................................................................. 125
   Yi Liu, Xianhui Yang, Zhihua Xiong, and Jie Zhang

Nonlinear Predictive Control Based on Wavelet Neural Network Applied
to Polypropylene Process ............................................................ 131
   Xiaohua Xia, Zhiyan Luan, Dexian Huang, and Yihui Jin

Neural Network Control of Heat Exchanger Plant .................................. 137
   Mahdi Jalili-Kharraajoo

Remote Controller Design of Networked Control Systems
Based on Self-constructing Fuzzy Neural Network ................................ 143
   Yi Li, Qinke Peng, and Baosheng Hu

Sliding Mode Control for Cross Beam Simulation System via Neural Network ............................................................................ 150
   Hongchao Zhao, Qingjiu Xu, Wenjin Gu, and Tingxue Xu

Vibration Suppression of Adaptive Truss Structure
Using Fuzzy Neural Network ......................................................... 155
   Shaoze Yan, Kai Zheng, and Yangmin Li
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Investigation of Active Vibration Control</td>
<td>161</td>
</tr>
<tr>
<td>Using a Filtered-Error Neural Network and Piezoelectric Actuators</td>
<td></td>
</tr>
<tr>
<td><em>Yali Zhou, Qizhi Zhang, Xiaodong Li, and Woonseng Gan</em></td>
<td></td>
</tr>
<tr>
<td>Compensating Modeling and Control for Friction</td>
<td>167</td>
</tr>
<tr>
<td>Using RBF Adaptive Neural Networks</td>
<td></td>
</tr>
<tr>
<td><em>Yongfu Wang, Tianyou Chai, Lijie Zhao, and Ming Tie</em></td>
<td></td>
</tr>
<tr>
<td>Torque Control of Switched Reluctance Motors</td>
<td>173</td>
</tr>
<tr>
<td>Based on Flexible Neural Network</td>
<td></td>
</tr>
<tr>
<td><em>Baoming Ge, Aníbal T. de Almeida, and Fernando J.T.E. Ferreira</em></td>
<td></td>
</tr>
<tr>
<td>Position Control for PM Synchronous Motor Using Fuzzy Neural Network</td>
<td>179</td>
</tr>
<tr>
<td><em>Jun Wang, Hong Peng, and Xiao Jian</em></td>
<td></td>
</tr>
<tr>
<td>SVM Based Lateral Control for Autonomous Vehicle</td>
<td>185</td>
</tr>
<tr>
<td><em>Hanqing Zhao, Tao Wu, Daxue Liu, Yang Chen, and Hangen He</em></td>
<td></td>
</tr>
<tr>
<td>Control of Reusable Launch Vehicle Using Neuro-adaptive Approach</td>
<td>192</td>
</tr>
<tr>
<td><em>Yong D. Song, Xiao H. Liao, M.D. Gheorghiu, Ran Zhang, and Yao Li</em></td>
<td></td>
</tr>
</tbody>
</table>

### 13 Robotic Systems

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Neural Network Based on Biological Vision Learning and Its Application on Robot</td>
<td>198</td>
</tr>
<tr>
<td><em>Ying Gao, Xiaodan Lu, and Liming Zhang</em></td>
<td></td>
</tr>
<tr>
<td>Discrete-Time Adaptive Controller Design for Robotic Manipulators</td>
<td>204</td>
</tr>
<tr>
<td>via Neuro-fuzzy Dynamic Inversion</td>
<td></td>
</tr>
<tr>
<td><em>Fuchun Sun, Yuangang Tang, Lee Li, and Zhonghang Yin</em></td>
<td></td>
</tr>
<tr>
<td>General Underactuated Cooperating Manipulators</td>
<td>210</td>
</tr>
<tr>
<td>and Their Control by Neural Network</td>
<td></td>
</tr>
<tr>
<td><em>S. Murat Yeşioloğlu and Hakan Temeltas</em></td>
<td></td>
</tr>
<tr>
<td>Intelligent Fuzzy Q-Learning Control of Humanoid Robots</td>
<td>216</td>
</tr>
<tr>
<td><em>Meng Joo Er and Yi Zhou</em></td>
<td></td>
</tr>
<tr>
<td>Performance Analysis of Neural Network-Based Uncalibrated Hand-Eye Coordination</td>
<td>222</td>
</tr>
<tr>
<td><em>Jianbo Su</em></td>
<td></td>
</tr>
<tr>
<td>Formation Control for a Multiple Robotic System</td>
<td>228</td>
</tr>
<tr>
<td>Using Adaptive Neural Network</td>
<td></td>
</tr>
<tr>
<td><em>Yangmin Li and Xin Chen</em></td>
<td></td>
</tr>
<tr>
<td>Tip Tracking of a Flexible-Link Manipulator with Radial Basis Function and Fuzzy System</td>
<td>234</td>
</tr>
<tr>
<td><em>Yuangang Tang, Fuchun Sun, and Zengqi Sun</em></td>
<td></td>
</tr>
</tbody>
</table>
Obstacle Avoidance for Kinematically Redundant Manipulators Using the Deterministic Annealing Neural Network .......................... 240
Shubao Liu and Jun Wang

BP Networks Based Trajectory Planning and Inverse Kinematics of a Reconfigurable Mars Rover ............................................. 247
Liping Zhang, Shugen Ma, Bin Li, Zheng Zhang, Guowei Zhang, and Binggang Cao

A Novel Path Planning Approach Based on AppART and Particle Swarm Optimization .................................................. 253
Jian Tang, Jihong Zhu, and Zengqi Sun

A Neuro-fuzzy Controller for Reactive Navigation of a Behaviour-Based Mobile Robot ........................... 259
Anmin Zhu, Simon X. Yang, Fangju Wang, and Gauri S. Mittal

Research on the Calibration Method for the Heading Errors of Mobile Robot Based on Evolutionary Neural Network Prediction ........ 265
Jinxia Yu, Zixing Cai, Xiaobing Zou, and Zhuohua Duan

Adaptive Neural-Network Control for Redundant Nonholonomic Mobile Modular Manipulators .................. 271
Yangmin Li, Yugang Liu, and Shaoze Yan

A Neural Network-Based Camera Calibration Method for Mobile Robot Localization Problems .................. 277
Anmin Zou, Zengguang Hou, Lejie Zhang, and Min Tan

Abnormal Movement State Detection and Identification for Mobile Robots Based on Neural Networks ............. 285
Zhuohua Duan, Zixing Cai, Xiaobing Zou, and Jinxia Yu

A Neural Network Based Method for Shape Measurement in Steel Plate Forming Robot ................................. 291
Hua Xu, Peifa Jia, and Xuegong Zhang

Recurrent Networks for Integrated Navigation .......................... 297
Jianguo Fu, Yingcai Wang, Jianhua Li, Zhenyu Zheng, and Xingbo Yin

14 Telecommunication Networks

Application of Different Basis and Neural Network Turbo Decoding Algorithm in Multicarrier Modulation System over Time-Variant Channels ............ 303
Yupeng Jia, Dongfeng Yuan, Haixia Zhang, and Xinying Gao

Blind Detection of Orthogonal Space-Time Block Coding Based on ICA Schemes ................................................ 309
Ju Liu, Bo Gu, Hongji Xu, and Jianping Qiao
Improvement of Borrowing Channel Assignment
by Using Cellular Probabilistic Self-organizing Map

Sitao Wu and Xiaohong Wang

FPGA Realization of a Radial Basis Function
Based Nonlinear Channel Equalizer

Poyueh Chen, Hungming Tsai, Cheng Jian Lin, and Chi Yang Lee

Varying Scales Wavelet Neural Network
Based on Entropy Function and Its Application in Channel Equalization

Mingyan Jiang, Dongfeng Yuan, and Shouliang Sun

Robust Direction of Arrival (DOA) Estimation Using RBF Neural Network
in Impulsive Noise Environment

Hong Tang, Tianshuang Qiu, Sen Li, Ying Guo, and Wenrong Zhang

Quantum Neural Network for CDMA Multi-user Detection

Fei Li, Shengmei Zhao, and Baoyu Zheng

A New QoS Routing Optimal Algorithm in Mobile Ad Hoc Networks
Based on Hopfield Neural Network

Jian Liu, Dongfeng Yuan, Song Ci, and Yingji Zhong

Content Filtering of Decentralized P2P Search System
Based on Heterogeneous Neural Networks Ensemble

Xianghua Fu and Boqin Feng

Collaborative Filtering Based on Neural Networks Using Similarity

Eunju Kim, Myungwon Kim, and Joungwoo Ryu

Using Double-Layer One-Class Classification
for Anti-jamming Information Filtering

Qiang Sun, Jianhua Li, Xinran Liang, and Shenghong Li

Remote OS Fingerprinting Using BP Neural Network

Wenwei Li, Dafang Zhang, and Jinmin Yang

Emotional Learning Based Intelligent Traffic Control of ATM Networks

Mahdi Jalili-Kharraajoo, Mohammadreza Sadri, and Farzad Habibipour Roudsari

Multi-agent Congestion Control for High-Speed Networks
Using Reinforcement Co-learning

Kaoshing Hwang, Mingchang Hsiao, Chengshong Wu, and Shunwen Tan

Multi-scale Combination Prediction Model
with Least Square Support Vector Machine for Network Traffic

Zunxiong Liu, Deyun Zhang, and Huichuan Liao
Clustering Algorithm Based on Wavelet Neural Network Mobility Prediction in Mobile Ad Hoc Network .......................................................... 391
   Yanlei Shang, Wei Guo, and Shiduan Cheng

Internet Traffic Prediction by W-Boost: Classification and Regression ........ 397
   Hanghang Tong, Chongrong Li, Jingrui He, and Yang Chen

Fuzzy Neural Network for VBR MPEG Video Traffic Prediction ............... 403
   Xiaoying Liu, Xiaodong Liu, Xiaokang Lin, and Qionghai Dai

15 Incidence Detection

Building an Intrusion Detection System Based on Support Vector Machine and Genetic Algorithm ......................... 409
   Rongchang Chen, Jeannie Chen, Tungshou Chen, Chunhung Hsieh,
   Teyu Chen, and Kaiyang Wu

Fusions of GA and SVM for Anomaly Detection in Intrusion Detection System . 415
   Dong Seong Kim, Ha-Nam Nguyen, Syng-Yup Ohn, and Jong Sou Park

A Genetic SOM Clustering Algorithm for Intrusion Detection ................. 421
   Zhenying Ma

Intrusion Detection Based on Dynamic Self-organizing Map Neural Network Clustering ...................................................... 428
   Yong Feng, Kaigui Wu, Zhongfu Wu, and Zhongyang Xiong

Intrusion Detection Based on MLP Neural Networks and K-Means Algorithm . 434
   Hongying Zheng, Lin Ni, and Di Xiao

Feature Selection and Intrusion Detection Using Hybrid Flexible Neural Tree . 439
   Yuehui Chen, Ajith Abraham, and Ju Yang

Detection of Epileptic Spikes with Empirical Mode Decomposition and Nonlinear Energy Operator .......................... 445
   Suyuan Cui, Xiaoli Li, Gaoxiang Ouyang, and Xinping Guan

Neural Networks for Solving On-Line Outlier Detection Problems ............ 451
   Tianqi Yang

Pedestrian Detection by Multiple Decision-Based Neural Networks .......... 457
   Chen Huang, Guangrong Tang, and Yupin Luo

A Visual Automatic Incident Detection Method on Freeway Based on RBF and SOFM Neural Networks ............................ 463
   Xuhua Yang, Qiu Guan, Wanliang Wang, and Shengyong Chen

A Self-organizing Map Method for Optical Fiber Fault Detection and Location . 470
   Yi Chai, Wenzhou Dai, Maoyun Guo, Shangfu Li, and Zhifen Zhang
Anomaly Internet Network Traffic Detection
by Kernel Principle Component Classifier .............................. 476
    Hanghang Tong, Chongrong Li, Jingrui He, Jiajian Chen,
    Quang-Anh Tran, Haixin Duan, and Xing Li

Intelligent Hierarchical Intrusion Detection System
for Secure Wireless Ad Hoc Network ................................ 482
    Peng Fu, Deyun Zhang, Lei Wang, and Zhongxing Duan

A New Approach of Network Intrusion Detection Using HVDM-Based SOM .... 488
    Lei Wang, Yong Yang, and Shixin Sun

A Novel Approach to Corona Monitoring ................................ 494
    Chiman Kwan, Tao Qian, Zhubing Ren, Hongda Chen, Roger Xu,
    Weijen Lee, Hemiao Zhang, and Joseph Sheeley

16 Fault Diagnosis

Multi-class Probability SVM Fusion Using Fuzzy Integral for Fault Diagnosis ... 501
    Zhonghui Hu, Yunze Cai, Xing He, Ye Li, and Xiaoming Xu

A Rapid Response Intelligent Diagnosis Network
Using Radial Basis Function Network ..................................... 508
    Guangrui Wen, Liangsheng Qu, and Xining Zhang

An Integrated Approach to Fault Diagnosis
Based on Variable Precision Rough Set and Neural Networks ......................... 514
    Qingmin Zhou and Chenbo Yin

Hybrid PSO Based Wavelet Neural Networks for Intelligent Fault Diagnosis ...... 521
    Qianjin Guo, Haibin Yu, and Aidong Xu

Global-Based Structure Damage Detection
Using LVQ Neural Network and Bispectrum Analysis ............................. 531
    Guangming Dong, Jin Chen, Xuanyang Lei, Zuogui Ning,
    Dongsheng Wang, and Xiongxian Wang

Fault Detection for Plasma Etching Processes Using RBF Neural Networks ...... 538
    Yaw-Jen Chang

Detecting Sensor Faults for a Chemical Reactor Rig
via Adaptive Neural Network Model ......................................... 544
    Ding-Li Yu and Dingwen Yu

Optimal Actuator Fault Detection via MLP Neural Network for PDFs .............. 550
    Lei Guo, Yumin Zhang, Chengliang Liu, Hong Wang, and Chunbo Feng
Feature Selection and Classification of Gear Faults Using SOM .......................... 556
   Guanglan Liao, Tielin Shi, Weihua Li, and Tao Huang

Application of Fuzzy SOFM Neural Network
and Rough Set Theory on Fault Diagnosis for Rotating Machinery ............. 561
   Dongxiang Jiang, Kai Li, Gang Zhao, and Jinhui Diao

Identification of the Acoustic Fault Sources of Underwater Vehicles
Based on Modular Structure Variable RBF Network .............................. 567
   Linke Zhang, Lin He, Kerong Ben, Na Wei, Yunfu Pang, and Shijian Zhu

A Dynamic Recurrent Neural Network Fault Diagnosis
and Isolation Architecture for Satellite’s Actuator/Thruster Failures ............. 574
   Li Li, Liying Ma, and Khashayar Khorasani

Fault Detection in Reaction Wheel of a Satellite
Using Observer-Based Dynamic Neural Networks .............................. 584
   Zhongqi Li, Liying Ma, and Khashayar Khorasani

Adaptive Wavelet Packet Neural Network Based Fault Diagnosis
for Missile’s Amplifier ............................................................ 591
   Zhijie Zhou, Changhua Hu, Xiaoxia Han, and Guangjun Chen

Crack Detection in Supported Beams
Based on Neural Network and Support Vector Machine .......................... 597
   Long Liu and Guang Meng

Early Loosening Fault Diagnosis of Clamping Support
Based on Information Fusion ......................................................... 603
   Weixiang Sun, Jin Chen, Xing Wu, Fucai Li, Guicai Zhang, and GM Dong

Insulating Fault Diagnosis of XLPE Power Cables
Using Multi-parameter Based on Artificial Neural Networks .................... 609
   Xiaolin Chen, Yonghong Cheng, Zhelei Zhu, Bo Yue, and Xiaojun Xie

17 Power Systems

A Hybrid Method and Its Application for Power System ....................... 616
   Xusheng Yang, Yong You, Wanxing Sheng, and Sunan Wang

Fuzzy Neural Very-Short-Term Load Forecasting
Based on Chaotic Dynamics Reconstruction ................................. 622
   Hongying Yang, Hao Ye, Guizeng Wang, and Tongfu Hu

Application of Neural Networks
for Very Short-Term Load Forecasting in Power Systems .................... 628
   Hungcheng Chen, Kuohua Huang, and Lungyi Chang
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next Day Load Forecasting Using SVM</td>
<td>634</td>
</tr>
<tr>
<td>Xunming Li, Dengcai Gong, Linfeng Li, and Changyin Sun</td>
<td></td>
</tr>
<tr>
<td>Peak Load Forecasting Using the Self-organizing Map</td>
<td>640</td>
</tr>
<tr>
<td>Shu Fan, Chengxiong Mao, and Luonan Chen</td>
<td></td>
</tr>
<tr>
<td>Ship Power Load Prediction Based on RST and RBF Neural Networks</td>
<td>648</td>
</tr>
<tr>
<td>Jianmei Xiao, Tengfei Zhang, and Xihuai Wang</td>
<td></td>
</tr>
<tr>
<td>Contingency Screening of Power System Based on Rough Sets and Fuzzy ARTMAP</td>
<td>654</td>
</tr>
<tr>
<td>Youping Fan, Yunping Chen, Wansheng Sun, Dong Liu, and Yi Chai</td>
<td></td>
</tr>
<tr>
<td>Intelligent Neuro-fuzzy Based Predictive Control of a Continuous Stirred Tank Reactor</td>
<td>662</td>
</tr>
<tr>
<td>Mahdi Jalili-Kharraajoo and Farzad Habibipour Roudsari</td>
<td></td>
</tr>
<tr>
<td>Adaptive Neuro-fuzzy SVC for Multimachine Hybrid Power System</td>
<td>668</td>
</tr>
<tr>
<td>Stability Improvement with a Long of Double Circuit Transmission Lines</td>
<td></td>
</tr>
<tr>
<td>Chamni Jaipradidatham</td>
<td></td>
</tr>
<tr>
<td>Application of BP Network-Based Multi-sensor Fusion Techniques in Measurement of the Unburned Carbon in Fly Ash</td>
<td>674</td>
</tr>
<tr>
<td>Gaowei Yan, Gang Xie, Keming Xie, Zehua Chen, and Hongbing Wang</td>
<td></td>
</tr>
</tbody>
</table>

18 Biomedical Applications

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification of Nuclear Receptor Subfamilies with RBF Kernel in Support Vector Machine</td>
<td>680</td>
</tr>
<tr>
<td>Jun Cai and Yanda Li</td>
<td></td>
</tr>
<tr>
<td>Prediction of Contact Maps in Proteins Based on Recurrent Neural Network with Bias Units</td>
<td>686</td>
</tr>
<tr>
<td>Guixia Liu, Chenguang Zhou, Yuanxian Zhu, and Wengang Zhou</td>
<td></td>
</tr>
<tr>
<td>A SVR-Based Multiple Modeling Algorithm for Antibiotic Fermentation Process Using FCM</td>
<td>691</td>
</tr>
<tr>
<td>Yaofeng Xue and Jingqi Yuan</td>
<td></td>
</tr>
<tr>
<td>Non-parametric Statistical Tests for Informative Gene Selection</td>
<td>697</td>
</tr>
<tr>
<td>Jinwen Ma, Fuhai Li, and Jianfeng Liu</td>
<td></td>
</tr>
<tr>
<td>An Information Criterion for Informative Gene Selection</td>
<td>703</td>
</tr>
<tr>
<td>Fei Ge and Jinwen Ma</td>
<td></td>
</tr>
<tr>
<td>OPTOC-Based Clustering Analysis of Gene Expression Profiles in Spectral Space</td>
<td>709</td>
</tr>
<tr>
<td>Shuanhu Wu, Alan Wee Chung Liew, and Hong Yan</td>
<td></td>
</tr>
</tbody>
</table>
Model the Relationship Between Gene Expression and TFBSs  
Using a Simplified Neural Network with Bayesian Variable Selection  
Xiaobo Zhou, Kuang-Yu Liu, Guangqin Li, and Stephen Wong  
719

Synchrony of Basic Neuronal Network Based on Event Related EEG  
Xiaotong Wen, Xiaojie Zhao, and Li Yao  
725

Non-negative Matrix Factorizations  
Based Spontaneous Electroencephalographic Signals Classification  
Using Back Propagation Feedback Neural Networks  
Mingyu Liu, Jue Wang, and Chongxun Zheng  
731

Neural Networks Preprocessing Based Adaptive Latency Change Estimation  
of Evoked Potentials  
Yongmei Sun, Tianshuang Qiu, Wenhong Liu, Wenqiang Guo, and Hui Li  
737

Blind Estimation of Evoked Potentials  
Based on Fractional Lower Order Statistics  
Daifeng Zha, Tianshuang Qiu, and Xiaobing Li  
742

Wavelet Denoise on MRS Data Based on ICA and PCA  
Jian Ma, Zengqi Sun, Guangbo Dong, and Guihai Xie  
748

Hard Margin SVM for Biomedical Image Segmentation  
Chen Pan, Xiangguo Yan, and Chongxun Zheng  
754

Multisensors Information Fusion with Neural Networks  
for Noninvasive Blood Glucose Detection  
Wei Wang, Lanfeng Yan, Baowei Liu, and Heng Zhang  
760

Disease Diagnosis Using Query-Based Neural Networks  
Ray-I Chang  
767

Study of BP Neural Network and Its Application  
in Lung Cancer Intelligent Diagnosis  
Xuemei Huang, Zhide Tang, and Caixin Sun  
774

New Methodology of Computer Aided Diagnostic System on Breast Cancer  
HeeJun Song, SeonGu Lee, Dongwon Kim, and GwiTae Park  
780

Spiculated Lesion Detection in Digital Mammogram  
Based on Artificial Neural Network Ensemble  
Ning Li, Huajie Zhou, Jinjiang Ling, and Zhihua Zhou  
790

Classification of Psychiatric Disorders Using Artificial Neural Network  
Shishir Bashyal  
796

Multilevel Neural Network to Diagnosis Procedure  
of Traditional Chinese Medicine  
Zhanquan Sun, Jianqiang Yi, and Guangcheng Xi  
801
19  Industrial Applications

An Automated Blowing Control System Using the Hybrid Concept of Case Based Reasoning and Neural Networks in Steel Industry .......................... 807
   Jonghan Kim, Eoksu Sim, and Sungwon Jung

Neural Networks Based Multiplex Forecasting System of the End-Point of Copper Blow Period ....................................................... 813
   Lihua Xue, Hongzhong Huang, Yaohua Hu, and Zhangming Shi

Modeling and Prediction of Electric Arc Furnace Based on Neural Network and Chaos Theory .................................................. 819
   Fenghua Wang, Zhijian Jin, and Zishu Zhu

Modeling and Prediction of Violent Abnormal Vibration of Large Rolling Mills Based on Chaos and Wavelet Neural Networks ............ 827
   Zhonghui Luo, Xiaozhen Wang, Xiaoning Xue, Baihai Wu, and Yibin Yu

Neural Grey Box Model for Power Estimation in Semiautogenous Mill ................................................................. 833
   Tito Valenzuela, Karina Carvajal, Gonzalo Acuña, Max Chacón, and Luis Magne

Neural Network Based On-Line Shrinking Horizon Re-optimization of Fed-Batch Processes ......................................................... 839
   Zhihua Xiong, Jie Zhang, Xiong Wang, and Yongmao Xu

Chip Speed Prediction Model for Optimization of Semiconductor Manufacturing Process Using Neural Networks and Statistical Methods ..... 845
   Tae Seon Kim

Using ANNs to Model Hot Extrusion Manufacturing Process .................. 851
   Kesheng Wang, Per Alvestad, Yi Wang, Qingfeng Yuan, Minglun Fang, and Lingliang Sun

Application Research of Support Vector Machines in Condition Trend Prediction of Mechanical Equipment ..................... 857
   Junyan Yang and Youyun Zhang

Comparative Study on Engine Torque Modelling Using Different Neural Networks ............................................................... 865
   Ding-Li Yu and Michael Beham

A Hybrid Intelligent Soft-Sensor Model for Dynamic Particle Size Estimation in Grinding Circuits ........................................... 871
   Ming Tie, Heng Yue, and Tianyou Chai

Application of Artificial Neural Networks in Abrasive Waterjet Cutting Process ............................. 877
   Yiyu Lu, Xiaohong Li, Binquan Jiao, and Yong Liao
Intelligent Tool Condition Monitoring System for Turning Operations .......... 883
Hongli Gao and Mingheng Xu

A Recurrent Neural Network Modeling for Automotive Magnetorheological Fluid Shock Absorber ................. 890
Changrong Liao, Honghui Zhang, Miao Yu, Weimin Chen, and Jiansheng Weng

Geometrical Error Compensation of Gantry Stage Using Neural Networks ...... 897
Kok Kiong Tan, Sunan Huang, V. Prahlad, and Tong Heng Lee

Neural Particle Swarm Optimization for Casing Damage Prediction ............ 903
Quansheng Dou, Chunguang Zhou, Guanyu Pan, Hongwen Luo, and Quan Liu

A Novel Chamber Scheduling Method in Etching Tools Using Adaptive Neural Networks ........................................ 908
Hua Xu, Peifa Jia, and Xuegong Zhang

CFNN Without Normalization-Based Acetone Product Quality Prediction ....... 914
Jiao Wang and Xiong Wang

Combining Classifiers in Software Quality Prediction:
A Neural Network Approach .......................................................... 921
Qi Wang, Jie Zhu, and Bo Yu

Neural-Network-Driven Fuzzy Reasoning for Product Development Processes . . . 927
Yingkui Gu, Hongzhong Huang, and Yonghua Li

The Integration of the Neural Network and Computational Fluid Dynamics for the Heatsink Design .............................................. 933
Yeander Kuan and Hsinchung Lien

The Modeling and Application of Cost Predication Based on Neural Network . . . 939
Xiaoling Huang, Jiansheng Xue, and Liju Dong

Combining SOM and Fuzzy Rule Base for Sale Forecasting in Printed Circuit Board Industry ......................................................... 947
Pei-Chann Chang and K. Robert Lai

20 Other Applications

Improving Accuracy of Perceptron Predictor Through Correlating Data Values in SMT Processors ....................................................... 955
Liqiang He and Zhiyong Liu

A Genetic-Algorithm-Based Neural Network Approach for Short-Term Traffic Flow Forecasting ................................................. 965
Mingzhe Liu, Ruili Wang, Jiansheng Wu, and Ray Kemp
Table of Contents, Part III  XXXV

Self-organizing Map Analysis Consistent with Neuroimaging for Chinese Noun, Verb and Class-Ambiguous Word .......................... 971
  Minghu Jiang, Huiying Cai, and Bo Zhang

Self-organizing Map Analysis of Conceptual and Semantic Relations for Noun  . 977
  Minghu Jiang, Chengqing Zong, and Beixing Deng

Artificial Neural Network for Prediction of Rockburst in Deep-Buried Long Tunnel ................................................. 983
  Xiaohong Li, Xinfei Wang, Yong Kang, and Zheng He

Implementation of Brillouin-Active Fiber Based Neural Network in Smart Structures .................................................. 987
  Yongkab Kim, Sunja Lim, Hwan Y. Kim, Sungkwan Oh, and Chung Yu

Inelastic Simulation of Insect Cuticle Using Artificial Neural Network .......... 992
  Bin Chen, Gang Chen, Hongtao Liu, Xianghe Peng, and Jinghong Fan

Applying Neural Networks and Geographical Information Systems to Airport Noise Evaluation ...................................... 998
  Yingjie Yang, David Gillingwater, and Chris Hinde

An Artificial Neural Network Method for Map Correction .................. 1004
  Yi Chai, Maoyun Guo, Shangfu Li, Zhifen Zhang, and Dalong Feng

An Effective Two-Stage Neural Network Model and Its Application on Flood Loss Prediction .......................... 1010
  Li Yang, Chun Zuo, and Yuguo Wang

An Artificial Neural Network Model for Crop Yield Responding to Soil Parameters .................................................. 1017
  Gang Liu, Xuehong Yang, and Minzan Li

Research on Reservation Allocation Decision Method Based on Neural Network .................................................. 1022
  Ancheng Pan, Yongqing Yang, and Hanhui Hu

Wastewater BOD Forecasting Model for Optimal Operation Using Robust Time-Delay Neural Network .......................... 1028
  Lijie Zhao and Tianyou Chai

A Split-Step PSO Algorithm in Prediction of Water Quality Pollution ...... 1034
  Kwokwing Chau

Long-Term Prediction of Discharges in Manwan Reservoir Using Artificial Neural Network Models .......................... 1040
  Chuntian Cheng, Kwokwing Chau, Yingguang Sun, and Jianyi Lin
Application of Artificial Neural Networks to Predicate Shale Content .......... 1046
  Kesheng Wang, Resko Barna, Yi Wang, Maxim Boldin,
  and Ove R. Hjelmervik

Optimization of Forecasting Supply Chain Management Sustainable
Collaboration Using Hybrid Artificial Neural Network ......................... 1052
  Sehun Lim and Juhee Hahn

Multiple Criteria Inventory Classification
Based on Principal Components Analysis and Neural Network .............. 1058
  Quansheng Lei, Jian Chen, and Qing Zhou

Author Index ................................................................. 1065
# Table of Contents, Part I

## 1 Theoretical Analysis

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Coding, Bayesian Inference and Information Geometry</td>
<td>1</td>
</tr>
<tr>
<td><em>Shun-ichi Amari</em></td>
<td></td>
</tr>
<tr>
<td>One-Bit-Matching ICA Theorem, Convex-Concave Programming, and</td>
<td>5</td>
</tr>
<tr>
<td>Combinatorial Optimization</td>
<td></td>
</tr>
<tr>
<td><em>Lei Xu</em></td>
<td></td>
</tr>
<tr>
<td>Dynamic Models for Intention (Goal-Directedness) Are Required by</td>
<td>21</td>
</tr>
<tr>
<td>Truly Intelligent Robots</td>
<td></td>
</tr>
<tr>
<td><em>Walter J. Freeman</em></td>
<td></td>
</tr>
<tr>
<td>Differences and Commonalities Between Connectionism and Symbolicism</td>
<td>34</td>
</tr>
<tr>
<td><em>Shoujue Wang and Yangyang Liu</em></td>
<td></td>
</tr>
<tr>
<td>Pointwise Approximation for Neural Networks</td>
<td>39</td>
</tr>
<tr>
<td><em>Feilong Cao, Zongben Xu, and Youmei Li</em></td>
<td></td>
</tr>
<tr>
<td>On the Universal Approximation Theorem of Fuzzy Neural Networks with Random Membership Function Parameters</td>
<td>45</td>
</tr>
<tr>
<td><em>Lipo Wang, Bing Liu, and Chunru Wan</em></td>
<td></td>
</tr>
<tr>
<td>A Review: Relationship Between Response Properties of Visual Neurons and Advances in Nonlinear Approximation Theory</td>
<td>51</td>
</tr>
<tr>
<td><em>Shan Tan, Xiuli Ma, Xiangrong Zhang, and Licheng Jiao</em></td>
<td></td>
</tr>
<tr>
<td>Image Representation in Visual Cortex and High Nonlinear Approximation</td>
<td>57</td>
</tr>
<tr>
<td><em>Shan Tan, Xiangrong Zhang, Shuang Wang, and Licheng Jiao</em></td>
<td></td>
</tr>
<tr>
<td>Generalization and Property Analysis of GENET</td>
<td>63</td>
</tr>
<tr>
<td><em>Youmei Li, Zongben Xu, and Feilong Cao</em></td>
<td></td>
</tr>
<tr>
<td>On Stochastic Neutral Neural Networks</td>
<td>69</td>
</tr>
<tr>
<td><em>Yumin Zhang, Lei Guo, Lingyao Wu, and Chunbo Feng</em></td>
<td></td>
</tr>
<tr>
<td>Eigenanalysis of CMAC Neural Network</td>
<td>75</td>
</tr>
<tr>
<td><em>Chunshu Zhang</em></td>
<td></td>
</tr>
<tr>
<td>A New Definition of Sensitivity for RBFNN and Its Applications to</td>
<td>81</td>
</tr>
<tr>
<td>Feature Reduction</td>
<td></td>
</tr>
<tr>
<td><em>Xizhao Wang and Chunguo Li</em></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Complexity of Error Hypersurfaces in Multilayer Perceptrons with General Multi-input and Multi-output Architecture</td>
<td>87</td>
</tr>
<tr>
<td>Nonlinear Dynamical Analysis on Coupled Modified FitzHugh-Nagumo Neuron Model</td>
<td>95</td>
</tr>
<tr>
<td>Stability of Nonautonomous Recurrent Neural Networks with Time-Varying Delays</td>
<td>102</td>
</tr>
<tr>
<td>Global Exponential Stability of Non-autonomous Neural Networks with Variable Delay</td>
<td>108</td>
</tr>
<tr>
<td>A Generalized LMI-Based Approach to the Global Exponential Stability of Recurrent Neural Networks with Delay</td>
<td>114</td>
</tr>
<tr>
<td>A Further Result for Exponential Stability of Neural Networks with Time-Varying Delays</td>
<td>120</td>
</tr>
<tr>
<td>Improved Results for Exponential Stability of Neural Networks with Time-Varying Delays</td>
<td>126</td>
</tr>
<tr>
<td>Global Exponential Stability of Recurrent Neural Networks with Infinite Time-Varying Delays and Reaction-Diffusion Terms</td>
<td>132</td>
</tr>
<tr>
<td>Exponential Stability Analysis of Neural Networks with Multiple Time Delays</td>
<td>142</td>
</tr>
<tr>
<td>Exponential Stability of Cohen-Grossberg Neural Networks with Delays</td>
<td>149</td>
</tr>
<tr>
<td>Global Exponential Stability of Cohen-Grossberg Neural Networks with Time-Varying Delays and Continuously Distributed Delays</td>
<td>156</td>
</tr>
<tr>
<td>Exponential Stability of Stochastic Cohen-Grossberg Neural Networks with Time-Varying Delays</td>
<td>162</td>
</tr>
<tr>
<td>Exponential Stability of Fuzzy Cellular Neural Networks with Unbounded Delay</td>
<td>168</td>
</tr>
</tbody>
</table>
Global Exponential Stability of Reaction-Diffusion Hopfield Neural Networks with Distributed Delays ............................................ 174  
Zhihong Tang, Yiping Luo, and Feiqi Deng

Global Exponential Stability of Delayed Impulsive Hopfield Type Neural Networks .................................. 181  
Bingji Xu, Qun Wang, Yi Shen, and Xiaoxin Liao

Global Exponential Stability of Hopfield Neural Networks with Impulsive Effects .............................................. 187  
Zhichun Yang, Jinan Pei, Daoyi Xu, Yumei Huang, and Li Xiang

Global Exponential Stability of Discrete Time Hopfield Neural Networks with Delays .................................................... 193  
Qiang Zhang, Wenbing Liu, and Xiaopeng Wei

Stability Analysis of Uncertain Neural Networks with Linear and Nonlinear Time Delays ................................. 199  
Hanlin He, Zhongsheng Wang, and Xiaoxin Liao

Robust Stability for Delayed Neural Networks with Nonlinear Perturbation ......................................................... 203  
Li Xie, Tianming Liu, Jilin Liu, Weikang Gu, and Stephen Wong

Robust Stability Analysis of a Class of Hopfield Neural Networks with Multiple Delays .............................................. 209  
Huaguang Zhang, Ce Ji, and Derong Liu

Robust Stability of Interval Delayed Neural Networks .......... 215  
Wenlian Lu and Tianping Chen

Impulsive Robust Control of Interval Hopfield Neural Networks  .............................................................. 222  
Yinping Zhang and Jitao Sun

Global Attractivity of Cohen-Grossberg Model with Delays .............................................................. 229  
Tao Xiang, Xiaofeng Liao, and Jian Huang

High-Order Hopfield Neural Networks  ............................................. 235  
Yi Shen, Xiaojun Zong, and Minghui Jiang

Stability Analysis of Second Order Hopfield Neural Networks with Time Delays ............................................. 241  
Jinan Pei, Daoyi Xu, Zhichun Yang, and Wei Zhu

Convergence Analysis of Genetic Regulatory Networks Based on Nonlinear Measures ............................................. 247  
Hongtao Lu, Zhizhou Zhang, and Lin He

Stability Conditions for Discrete Neural Networks in Partial Simultaneous Updating Mode ................................. 253  
Runnian Ma, Shengrui Zhang, and Sheping Lei
Dynamic Behavior Analysis of Discrete Neural Networks with Delay .......................... 259
  Runnian Ma, Sheping Lei, and Shengrui Zhang

Existence and Stability of Periodic Solution
in a Class of Impulsive Neural Networks .................................................. 265
  Xiaofan Yang, David J. Evans, and Yuanyan Tang

Globally Attractive Periodic Solutions of Continuous-Time Neural Networks
and Their Discrete-Time Counterparts ...................................................... 271
  Changyin Sun, Liangzhen Xia, and Chunbo Feng

Globally Stable Periodic State of Delayed Cohen-Grossberg Neural Networks .... 276
  Chaojin Fu, Hanlin He, and Xiaoxin Liao

Globally Attractive Periodic State of Discrete-Time Cellular Neural Networks
with Time-Varying Delays ........................................................................ 282
  Zhigang Zeng, Boshan Chen, and Zengfu Wang

An Analysis for Periodic Solutions of High-Order BAM Neural Networks
with Delays ................................................................................................. 288
  Jianlong Qiu and Jinde Cao

Periodic Oscillation and Exponential Stability
of a Class of Competitive Neural Networks ................................................. 294
  Boshan Chen

Synchronous Behaviors of Two Coupled Neurons ........................................ 302
  Ying Wu, Jianxue Xu, and Wuyin Jin

Adaptive Synchronization of Delayed Neural Networks
Based on Parameters Identification ............................................................. 308
  Jin Zhou, Tianping Chen, and Lan Xiang

Strength and Direction of Phase Synchronization of Neural Networks .......... 314
  Yan Li, Xiaoli Li, Gaoxiang Ouyang, and Xinping Guan

Hopf Bifurcation in a Single Inertial Neuron Model:
A Frequency Domain Approach ................................................................. 320
  Shaorong Li, Shaowen Li, Xipeng Sun, and Jie Li

Hopf Bifurcation in a Single Inertial Neuron Model with a Discrete Delay ...... 327
  Shaowen Li and Shaorong Li

Stability and Bifurcation of a Neuron Model with Delay-Dependent Parameters 334
  Xu Xu and Yanchun Liang

Stability and Chaos of a Neural Network with Uncertain Time Delays .......... 340
  Shangbo Zhou, Hua Li, and Zhongfu Wu

Chaotic Synchronization of Delayed Neural Networks ................................ 346
  Fenghua Tu, Xiaofeng Liao, and Chuandong Li
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaos Synchronization for Bi-directional Coupled Two-Neuron Systems</td>
<td>351</td>
</tr>
<tr>
<td><em>Xiaohong Zhang and Shangbo Zhou</em></td>
<td></td>
</tr>
<tr>
<td>Complex Dynamics in a Simple Hopfield-Type Neural Network</td>
<td>357</td>
</tr>
<tr>
<td><em>Qingdu Li and Xiaosong Yang</em></td>
<td></td>
</tr>
<tr>
<td>Adaptive Chaotic Controlling Method of a Chaotic Neural Network Model</td>
<td>363</td>
</tr>
<tr>
<td><em>Lidan Wang, Shukai Duan, and Guangyuan Liu</em></td>
<td></td>
</tr>
</tbody>
</table>

### 2 Model Design

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modeling Cortex Network: A Spatio-temporal Population Approach</td>
<td>369</td>
</tr>
<tr>
<td><em>Wentao Huang, Licheng Jiao, Maoguo Gong, and Chuang Guo</em></td>
<td></td>
</tr>
<tr>
<td>A Special Kind of Neural Networks: Continuous Piecewise Linear Functions</td>
<td>375</td>
</tr>
<tr>
<td><em>Xusheng Sun and Shuning Wang</em></td>
<td></td>
</tr>
<tr>
<td>A Novel Dynamic Structural Neural Network with Neuron-Regeneration and Neuron-Degeneration Mechanisms</td>
<td>380</td>
</tr>
<tr>
<td><em>Yingtung Hsiao, Chenglong Chuang, Joeair Jiang, Chiang Wang, and Chengchih Chien</em></td>
<td></td>
</tr>
<tr>
<td>A New Adaptive Ridgelet Neural Network</td>
<td>385</td>
</tr>
<tr>
<td><em>Shuyuan Yang, Min Wang, and Licheng Jiao</em></td>
<td></td>
</tr>
<tr>
<td>Designing Neural Networks Using Hybrid Particle Swarm Optimization</td>
<td>391</td>
</tr>
<tr>
<td><em>Bo Liu, Ling Wang, Yihui Jin, and Dexian Huang</em></td>
<td></td>
</tr>
<tr>
<td>A New Strategy for Designing Bidirectional Associative Memories</td>
<td>398</td>
</tr>
<tr>
<td><em>Gengsheng Zheng, Sidney Nascimento Givigi, and Weiyu Zheng</em></td>
<td></td>
</tr>
<tr>
<td>Genetically Optimized Hybrid Fuzzy Neural Networks Based on TSK Fuzzy Rules and Polynomial Neurons</td>
<td>404</td>
</tr>
<tr>
<td><em>Sungkwun Oh, Byoungjun Park, and Hyunki Kim</em></td>
<td></td>
</tr>
<tr>
<td>Genetically Optimized Self-organizing Fuzzy Polynomial Neural Networks Based on Information Granulation</td>
<td>410</td>
</tr>
<tr>
<td><em>Hosung Park, Dahee Park, and Sungkwun Oh</em></td>
<td></td>
</tr>
<tr>
<td>Identification of ANFIS-Based Fuzzy Systems with the Aid of Genetic Optimization and Information Granulation</td>
<td>416</td>
</tr>
<tr>
<td><em>Sungkwun Oh, Keonjun Park, and Hyungsoo Hwang</em></td>
<td></td>
</tr>
<tr>
<td>Design of Rule-Based Neurofuzzy Networks by Means of Genetic Fuzzy Set-Based Granulation</td>
<td>422</td>
</tr>
<tr>
<td><em>Byoungjun Park and Sungkwun Oh</em></td>
<td></td>
</tr>
<tr>
<td>Design of Genetic Fuzzy Set-Based Polynomial Neural Networks with the Aid of Information Granulation</td>
<td>428</td>
</tr>
<tr>
<td>Sungkwon Oh, Seokbeom Roh, and Yongkab Kim</td>
<td></td>
</tr>
<tr>
<td>A Novel Self-organizing Neural Fuzzy Network for Automatic Generation of Fuzzy Inference Systems</td>
<td>434</td>
</tr>
<tr>
<td>Meng Joo Er and Rishikesh Parthasarathi</td>
<td></td>
</tr>
<tr>
<td>Constructive Fuzzy Neural Networks and Its Application</td>
<td>440</td>
</tr>
<tr>
<td>Lunwen Wang, Ying Tan, and Ling Zhang</td>
<td></td>
</tr>
<tr>
<td>A Novel CNN Template Design Method Based on GIM</td>
<td>446</td>
</tr>
<tr>
<td>Jianye Zhao, Hongling Meng, and Daoheng Yu</td>
<td></td>
</tr>
<tr>
<td>A Novel Generalized Congruence Neural Networks</td>
<td>455</td>
</tr>
<tr>
<td>Yong Chen, Guoyin Wang, Fan Jin, and Tianyun Yan</td>
<td></td>
</tr>
<tr>
<td>A SOM Based Model Combination Strategy</td>
<td>461</td>
</tr>
<tr>
<td>Cristofer Englund and Antanas Verikas</td>
<td></td>
</tr>
<tr>
<td>Typical Sample Selection and Redundancy Reduction for Min-Max Modular Network with GZC Function</td>
<td>467</td>
</tr>
<tr>
<td>Jing Li, Baoliang Lu, and Michinori Ichikawa</td>
<td></td>
</tr>
<tr>
<td>Parallel Feedforward Process Neural Network with Time-Varying Input and Output Functions</td>
<td>473</td>
</tr>
<tr>
<td>Shisheng Zhong, Gang Ding, and Daizhong Su</td>
<td></td>
</tr>
<tr>
<td>A Novel Solid Neuron-Network Chip Based on Both Biological and Artificial Neural Network Theories</td>
<td>479</td>
</tr>
<tr>
<td>Zihong Liu, Zhihua Wang, Guolin Li, and Zhiping Yu</td>
<td></td>
</tr>
<tr>
<td>Associative Memory Using Nonlinear Line Attractor Network for Multi-valued Pattern Association</td>
<td>485</td>
</tr>
<tr>
<td>Ming-Jung Seow and Vijayan K. Asari</td>
<td></td>
</tr>
<tr>
<td>Associative Chaotic Neural Network via Exponential Decay Spatio-temporal Effect</td>
<td>491</td>
</tr>
<tr>
<td>Shukai Duan and Lidan Wang</td>
<td></td>
</tr>
<tr>
<td>On a Chaotic Neural Network with Decaying Chaotic Noise</td>
<td>497</td>
</tr>
<tr>
<td>Tianyi Ma, Ling Wang, Yingtao Jiang, and Xiaozong Yang</td>
<td></td>
</tr>
<tr>
<td>Extension Neural Network-Type 3</td>
<td>503</td>
</tr>
<tr>
<td>Manghui Wang</td>
<td></td>
</tr>
<tr>
<td>Pulsed Para-neural Networks (PPNN) Based on MEXORs and Counters</td>
<td>509</td>
</tr>
<tr>
<td>Junquan Li and Yixin Yin</td>
<td></td>
</tr>
</tbody>
</table>
Using Ensemble Information in Swarming Artificial Neural Networks .......................... 515
  Jian Tang, Zengqi Sun, and Jihong Zhu

Negatively Correlated Neural Network Ensemble
with Multi-population Particle Swarm Optimization ........................................ 520
  Zheng Qin, Yu Liu, Xingchen Heng, and Xianhui Wang

Wrapper Approach for Learning Neural Network Ensemble
by Feature Selection ...................................................................................... 526
  Haixia Chen, Senmiao Yuan, and Kai Jiang

Constructive Ensemble of RBF Neural Networks
and Its Application to Earthquake Prediction ............................................ 532
  Yue Liu, Yuan Li, Guozheng Li, Bofeng Zhang, and Genfeng Wu

3 Learning Methods

The Bounds on the Rate of Uniform Convergence for Learning Machine ........ 538
  Bin Zou, Luoqing Li, and Jie Xu

Supervised Learning on Local Tangent Space ............................................. 546
  Hongyu Li, Li Teng, Wenbin Chen, and I-Fan Shen

Study Markov Neural Network by Stochastic Graph .................................... 552
  Yali Zhao, Guangcheng Xi, and Jianqiang Yi

An Efficient Recursive Total Least Squares Algorithm
for Training Multilayer Feedforward Neural Networks ................................ 558
  Nakjin Choi, JunSeok Lim, and KoengMo Sung

A Robust Learning Algorithm for Feedforward Neural Networks
with Adaptive Spline Activation Function .................................................. 566
  Lingyun Hu and Zengqi Sun

A New Modified Hybrid Learning Algorithm for Feedforward Neural Networks
.......................................................... 572
  Fei Han, Deshuang Huang, Yiuming Cheung, and Guangbin Huang

Robust Recursive TLS (Total Least Square) Method
Using Regularized UDU Decomposed
for FNN (Feedforward Neural Network) Training ........................................ 578
  JunSeok Lim, Nakjin Choi, and KoengMo Sung

An Improved Backpropagation Algorithm Using Absolute Error Function .... 585
  Jiancheng Lv and Zhang Yi

An Improved Relative Criterion Using BP Algorithm ............................... 591
  Zhiyong Zhang, Jingang Liu, and Zhongzhi Shi
Solving Hard Local Minima Problems Using Basin Cells for Multilayer Perceptron Training .................................................. 597
  Younggui Yoon and Jaewook Lee

Enhanced Fuzzy Single Layer Perceptron .................................. 603
  Kwangbaek Kim, Sungshin Kim, Younghoon Joo, and Am-Sok Oh

A New Training Algorithm for a Fuzzy Perceptron and Its Convergence ........ 609
  Jie Yang, Wei Wu, and Zhiqiong Shao

Stochastic Fuzzy Neural Network and Its Robust Parameter Learning Algorithm .................................................. 615
  Junping Wang and Quanshi Chen

Applying Neural Network to Reinforcement Learning in Continuous Spaces ...... 621
  Dongli Wang, Yang Gao, and Pei Yang

Multiagent Reinforcement Learning Algorithm Using Temporal Difference Error .................................................. 627
  SeungGwan Lee

A Foremost-Policy Reinforcement Learning Based ART2 Neural Network and Its Learning Algorithm ........................................ 634
  Jian Fan and Gengfeng Wu

A Reinforcement Learning Based Radial-Basis Function Network Control System .................................................. 640
  Jianing Li, Jianqiang Yi, Dongbin Zhao, and Guangcheng Xi

Structure Pruning Strategies for Min-Max Modular Network ................. 646
  Yang Yang and Baoliang Lu

Sequential Bayesian Learning for Modular Neural Networks .................. 652
  Pan Wang, Zhun Fan, Youfeng Li, and Shan Feng

A Modified Genetic Algorithm for Fast Training Neural Networks .......... 660
  Dongsun Kim, Hyunsik Kim, and Duckjin Chung

Immunity Clonal Synergetic Learning of Unbalanced Attention Parameters in Synergetic Network ........................................ 666
  Xiuli Ma and Licheng Jiao

Optimizing Weights of Neural Network Using an Adaptive Tabu Search Approach .................................................. 672
  Yi He, Yuhui Qiu, Guangyuan Liu, and Kaiyou Lei

Semi-supervised Learning for Image Retrieval Using Support Vector Machines . 677
  Ke Lu, Jidong Zhao, Mengqin Xia, and Jiazhi Zeng
4 Optimization Methods

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neural Networks for Nonconvex Nonlinear Programming Problems:</td>
<td></td>
</tr>
<tr>
<td>A Switching Control Approach</td>
<td>694</td>
</tr>
<tr>
<td>Changyin Sun and Chunbo Feng</td>
<td></td>
</tr>
<tr>
<td>Deterministic Global Optimization with a Neighbourhood</td>
<td></td>
</tr>
<tr>
<td>Determination Algorithm Based on Neural Networks</td>
<td>700</td>
</tr>
<tr>
<td>Weitao Sun, Jiwu Shu, and Weimin Zheng</td>
<td></td>
</tr>
<tr>
<td>A Neural Network Methodology of Quadratic Optimization</td>
<td></td>
</tr>
<tr>
<td>with Quadratic Equality Constraints</td>
<td>706</td>
</tr>
<tr>
<td>Yongqing Yang, Jinde Cao, and Daqi Zhu</td>
<td></td>
</tr>
<tr>
<td>A Hopfiled Neural Network for Nonlinear Constrained Optimization Problems</td>
<td></td>
</tr>
<tr>
<td>Based on Penalty Function</td>
<td>712</td>
</tr>
<tr>
<td>Zhiqing Meng and Chuangyin Dang</td>
<td></td>
</tr>
<tr>
<td>A Neural Network Algorithm for Second-Order Conic Programming</td>
<td></td>
</tr>
<tr>
<td>Xuewen Mu, Sanyang Liu, and Yaling Zhang</td>
<td>718</td>
</tr>
<tr>
<td>Application of Neural Network to Interactive Physical Programming</td>
<td></td>
</tr>
<tr>
<td>Hongzhong Huang and Zhigang Tian</td>
<td>725</td>
</tr>
<tr>
<td>Application of the “Winner Takes All” Principle</td>
<td></td>
</tr>
<tr>
<td>in Wang’s Recurrent Neural Network for the Assignment Problem</td>
<td>731</td>
</tr>
<tr>
<td>Paulo Henrique Siqueira, Sergio Scheer, and Maria Teresinha Arns Steiner</td>
<td></td>
</tr>
<tr>
<td>Theoretical Analysis and Parameter Setting of Hopfield Neural Networks</td>
<td></td>
</tr>
<tr>
<td>Hong Qu, Zhang Yi, and XiaoLin Xiang</td>
<td>739</td>
</tr>
<tr>
<td>Solving Optimization Problems Based on Chaotic Neural Network</td>
<td></td>
</tr>
<tr>
<td>with Hysteretic Activation Function</td>
<td>745</td>
</tr>
<tr>
<td>Xiuhong Wang, Qingli Qiao, and Zhengqu Wang</td>
<td></td>
</tr>
<tr>
<td>An Improved Transiently Chaotic Neural Network</td>
<td></td>
</tr>
<tr>
<td>for Solving the K-Coloring Problem</td>
<td>750</td>
</tr>
<tr>
<td>Shenshen Gu</td>
<td></td>
</tr>
<tr>
<td>A Sweep-Based TCNN Algorithm for Capacity Vehicle Routing Problem</td>
<td>756</td>
</tr>
<tr>
<td>Huali Sun, Jianying Xie, and Yaofeng Xue</td>
<td></td>
</tr>
</tbody>
</table>
5 Kernel Methods

Generalized Foley-Sammon Transform with Kernels .......................... 817
  Zhenzhou Chen and Lei Li

Sparse Kernel Fisher Discriminant Analysis ................................. 824
  Hongjie Xing, Yujiu Yang, Yong Wang, and Baogang Hu

Scaling the Kernel Function to Improve Performance
of the Support Vector Machine ........................................... 831
  Peter Williams, Sheng Li, Jianfeng Feng, and Si Wu

Online Support Vector Machines with Vectors Sieving Method .......... 837
  Liangzhi Gan, Zonghai Sun, and Youxian Sun
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least Squares Support Vector Machine Based on Continuous Wavelet Kernel</td>
<td>843</td>
</tr>
<tr>
<td>Xiangjun Wen, Yunze Cai, and Xiaoming Xu</td>
<td></td>
</tr>
<tr>
<td>Multiple Parameter Selection for LS-SVM Using Smooth Leave-One-Out Error</td>
<td>851</td>
</tr>
<tr>
<td>Liefeng Bo, Ling Wang, and Licheng Jiao</td>
<td></td>
</tr>
<tr>
<td>Trajectory-Based Support Vector Multicategory Classifier</td>
<td>857</td>
</tr>
<tr>
<td>Daewon Lee and Jaewook Lee</td>
<td></td>
</tr>
<tr>
<td>Multi-category Classification by Least Squares Support Vector Regression</td>
<td>863</td>
</tr>
<tr>
<td>Jingqing Jiang, Chunguo Wu, and Yanchun Liang</td>
<td></td>
</tr>
<tr>
<td>Twi-Map Support Vector Machine for Multi-classification Problems</td>
<td>869</td>
</tr>
<tr>
<td>Zhifeng Hao, Bo Liu, Xiaowei Yang, Yanchun Liang, and Feng Zhao</td>
<td></td>
</tr>
<tr>
<td>Fuzzy Multi-class SVM Classifier Based on Optimal Directed Acyclic Graph</td>
<td>875</td>
</tr>
<tr>
<td>Using in Similar Handwritten Chinese Characters Recognition</td>
<td></td>
</tr>
<tr>
<td>Jun Feng, Yang Yang, and Jinsheng Fan</td>
<td></td>
</tr>
<tr>
<td>A Hierarchical and Parallel Method for Training Support Vector Machines</td>
<td>881</td>
</tr>
<tr>
<td>Yimin Wen and Baoliang Lu</td>
<td></td>
</tr>
<tr>
<td>Task Decomposition Using Geometric Relation for Min-Max Modular SVMs</td>
<td>887</td>
</tr>
<tr>
<td>Kaian Wang, Hai Zhao, and Baoliang Lu</td>
<td></td>
</tr>
<tr>
<td>A Novel Ridgelet Kernel Regression Method</td>
<td>893</td>
</tr>
<tr>
<td>Shuyuan Yang, Min Wang, Licheng Jiao, and Qing Li</td>
<td></td>
</tr>
<tr>
<td>Designing Nonlinear Classifiers Through Minimizing VC Dimension Bound</td>
<td>900</td>
</tr>
<tr>
<td>Jianhua Xu</td>
<td></td>
</tr>
<tr>
<td>A Cascaded Mixture SVM Classifier for Object Detection</td>
<td>906</td>
</tr>
<tr>
<td>Zejian Yuan, Nanning Zheng, and Yuehu Liu</td>
<td></td>
</tr>
<tr>
<td>Radar High Range Resolution Profiles Feature Extraction</td>
<td>913</td>
</tr>
<tr>
<td>Based on Kernel PCA and Kernel ICA</td>
<td></td>
</tr>
<tr>
<td>Hongwei Liu, Hongtao Su, and Zheng Bao</td>
<td></td>
</tr>
<tr>
<td>Controlling Chaotic Systems via Support Vector Machines</td>
<td>919</td>
</tr>
<tr>
<td>Without Analytical Model</td>
<td></td>
</tr>
<tr>
<td>Meiying Ye</td>
<td></td>
</tr>
<tr>
<td>Support Vector Regression for Software Reliability Growth Modeling</td>
<td>925</td>
</tr>
<tr>
<td>and Prediction</td>
<td></td>
</tr>
<tr>
<td>Fei Xing and Ping Guo</td>
<td></td>
</tr>
<tr>
<td>SVM-Based Semantic Text Categorization</td>
<td>931</td>
</tr>
<tr>
<td>for Large Scale Web Information Organization</td>
<td></td>
</tr>
<tr>
<td>Peng Fu, Deyun Zhang, Zhaofeng Ma, and Hao Dong</td>
<td></td>
</tr>
</tbody>
</table>
Fuzzy Support Vector Machine and Its Application to Mechanical Condition Monitoring ........................................... 937
Zhousuo Zhang, Qiao Hu, and Zhengjia He

6 Component Analysis

Guided GA-ICA Algorithms ........................................... 943
Juan Manuel Górriz, Carlos García Puntonet, Angel Manuel Gómez, and Oscar Pernía

A Cascaded Ensemble Learning for Independent Component Analysis .......... 949
Jian Cheng, Kongqiao Wang, and Yenwei Chen

A Step by Step Optimization Approach to Independent Component Analysis ... 955
Dengpan Gao, Jinwen Ma, and Qiansheng Cheng

Self-adaptive FastICA Based on Generalized Gaussian Model ................. 961
Gang Wang, Xin Xu, and Dewen Hu

An Efficient Independent Component Analysis Algorithm for Sub-Gaussian Sources ........................................... 967
Zhilin Zhang and Zhang Yi

ICA and Committee Machine-Based Algorithm for Cursor Control in a BCI System ........................................... 973
Jianzhao Qin, Yuanqing Li, and Andrzej Cichocki

Fast Independent Component Analysis for Face Feature Extraction .......... 979
Yiqiong Xu, Bicheng Li, and Bo Wang

Affine Invariant Descriptors for Color Images Based on Independent Component Analysis ........................................... 985
Chengming Liu, Xuming Huang, and Liming Zhang

A New Image Protection and Authentication Technique Based on ICA .......... 991
Linhua Zhang, Shaojiang Deng, and Xuebing Wang

Locally Spatiotemporal Saliency Representation: The Role of Independent Component Analysis ........................................... 997
Tao Jiang and Xingzhou Jiang

A Multistage Decomposition Approach for Adaptive Principal Component Analysis ........................................... 1004
Dazheng Feng

A New Kalman Filtering Algorithm for Nonlinear Principal Component Analysis ........................................... 1010
Xiaolong Zhu, Xianda Zhang, and Ying Jia
An Improvement on PCA Algorithm for Face Recognition ................. 1016  
*Vo Dinh Minh Nhat and Sungyoung Lee*

A Modified PCA Neural Network to Blind Estimation of the PN Sequence
in Lower SNR DS-SS Signals .................................................. 1022  
*Tianqi Zhang, Xiaokang Lin, Zhengzhong Zhou, and Aiping Mu*

A Modified MCA EXIN Algorithm and Its Convergence Analysis ........ 1028  
*Dezhong Peng, Zhang Yi, and XiaoLin Xiang*

Robust Beamforming by a Globally Convergent MCA Neural Network .... 1034  
*Mao Ye*

**Author Index** ................................................................. 1043