

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Alfred Kobsa

University of California, Irvine, CA, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Wen Yu Haibo He Nian Zhang (Eds.)

Advances in Neural Networks – ISNN 2009

6th International Symposium
on Neural Networks, ISNN 2009
Wuhan, China, May 26-29, 2009
Proceedings, Part II

Volume Editors

Wen Yu

Centro de Investigación y de Estudios Avanzados
del Instituto Politécnico Nacional (CINVESTAV-IPN)
Departamento de Control Automático
A.P. 14-740, Av. IPN 2508, 07360 México D.F., Mexico
E-mail: yuw@ctrl.cinvestav.mx

Haibo He

Stevens Institute of Technology
Department of Electrical and Computer Engineering
Castle Point on Hudson, Hoboken, NJ 07030, USA
E-mail: hhe@stevens.edu

Nian Zhang

South Dakota School of Mines & Technology
Department of Electrical and Computer Engineering
501 East St. Joseph Street, Rapid City, SD 57701, USA
E-mail: nian.zhang@sdsmt.edu

Library of Congress Control Number: Applied for

CR Subject Classification (1998): F.1, F.2, D.1, G.2, I.2, C.2, I.4-5, J.1-4

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN 0302-9743
ISBN-10 3-642-01509-3 Springer Berlin Heidelberg New York
ISBN-13 978-3-642-01509-0 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

springer.com

© Springer-Verlag Berlin Heidelberg 2009
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12672103 06/3180 5 4 3 2 1 0

Preface

This book and its companion volumes, LNCS vols. 5551, 5552 and 5553, constitute the proceedings of the 6th International Symposium on Neural Networks (ISNN 2009), held during May 26–29, 2009 in Wuhan, China. Over the past few years, ISNN has matured into a well-established premier international symposium on neural networks and related fields, with a successful sequence of ISNN symposia held in Dalian (2004), Chongqing (2005), Chengdu (2006), Nanjing (2007), and Beijing (2008). Following the tradition of the ISNN series, ISNN 2009 provided a high-level international forum for scientists, engineers, and educators to present state-of-the-art research in neural networks and related fields, and also to discuss with international colleagues on the major opportunities and challenges for future neural network research.

Over the past decades, the neural network community has witnessed tremendous efforts and developments in all aspects of neural network research, including theoretical foundations, architectures and network organizations, modeling and simulation, empirical study, as well as a wide range of applications across different domains. The recent developments of science and technology, including neuroscience, computer science, cognitive science, nano-technologies and engineering design, among others, have provided significant new understandings and technological solutions to move the neural network research toward the development of complex, large-scale, and networked brain-like intelligent systems. This long-term goal can only be achieved with the continuous efforts of the community to seriously investigate different issues of the neural networks and related fields. To this end, ISNN 2009 provided a great platform for the community to share their latest research results, discuss critical future research directions, stimulate innovative research ideas, as well as facilitate international multidisciplinary collaborations.

ISNN 2009 received 1235 submissions from about 2459 authors in 29 countries and regions (Australia, Brazil, Canada, China, Democratic People's Republic of Korea, Finland, Germany, Hong Kong, Hungary, India, Islamic Republic of Iran, Japan, Jordan, Macao, Malaysia, Mexico, Norway, Qatar, Republic of Korea, Singapore, Spain, Taiwan, Thailand, Tunisia, UK, USA, Venezuela, Vietnam, and Yemen) across six continents (Asia, Europe, North America, South America, Africa, and Oceania). Based on the rigorous peer reviews by the Program Committee members and the reviewers, 409 high-quality papers were selected for publication in the LNCS proceedings, with an acceptance rate of 33.1%. These papers cover major topics of the theoretical research, empirical study, and applications of neural networks. In addition to the contributed papers, the ISNN 2009 technical program included five plenary speeches by Anthony Kuh (University of Hawaii at Manoa, USA), Jose C. Principe (University of Florida, USA), Leszek Rutkowski (Technical University of Czestochowa, Poland), Fei-Yue Wang (Institute of Automation, Chinese Academy of Sciences, China) and Cheng Wu (Tsinghua University, China). Furthermore, ISNN 2009 also featured five special sessions focusing on emerging topics in neural network research.

As organizers of ISNN 2009, we would like to express our sincere thanks to the Huazhong University of Science and Technology, The Chinese University of Hong Kong, and the National Natural Science Foundation of China for their sponsorship, to the IEEE Wuhan Section, the IEEE Computational Intelligence Society, the International Neural Network Society, the Asia Pacific Neural Network Assembly, and the European Neural Network Society for their technical co-sponsorship, and to the Systems Engineering Society of Hubei Province and the IEEE Hong Kong Joint Chapter on Robotics and Automation and Control Systems for their logistic support.

We would also like to sincerely thank the General Chair and General Co-chairs for their overall organization of the symposium, members of the Advisory Committee and Steering Committee for their guidance in every aspect of the entire conference, and the members of the Organizing Committee, Special Sessions Committee, Publication Committee, Publicity Committee, Finance Committee, Registration Committee, and Local Arrangements Committee for all their great effort and time in organizing such an event. We would also like to take this opportunity to express our deepest gratitude to the members of the International Program Committee and all reviewers for their professional review of the papers; their expertise guaranteed the high quality of technical program of ISNN 2009!

Furthermore, we would also like to thank Springer for publishing the proceedings in the prestigious series of *Lecture Notes in Computer Science*. Moreover, we would like to express our heartfelt appreciations to the plenary and panel speakers for their vision and discussion of the latest research developments in the field as well as critical future research directions, opportunities, and challenges.

Finally, we would like to thank all the speakers, authors, and participants for their great contribution and support that made ISNN 2009 a great success.

May 2009

Wen Yu
Haibo He
Nian Zhang

Organization

General Chair

Shuzi Yang, China

General Co-chairs

Youlun Xiong, China

Yongchuan Zhang, China

Advisory Committee Chairs

Shoujue Wang, China

Paul J. Werbos, USA

Advisory Committee Members

Shun-ichi Amari, Japan

Zheng Bao, China

Tianyou Chai, China

Guanrong Chen, China

Shijie Cheng, China

Ruwei Dai, China

Jay Farrell, USA

Chunbo Feng, China

Russell Eberhart, USA

David Fogel, USA

Walter J. Freeman, USA

Kunihiko Fukushima, Japan

Marco Gilli, Italy

Aike Guo, China

Xingui He, China

Zhenya He, China

Petros Loannou, USA

Janusz Kacprzyk, Poland

Nikola Kasabov, New Zealand

Okyay Kaynak, Turkey

Frank L. Lewis, USA

Deyi Li, China

Yanda Li, China

Chin-Teng Lin, Taiwan

Robert J. Marks II, USA
Erkki Oja, Finland
Nikhil R. Pal, India
Marios M. Polycarpou, USA
Leszek Rutkowski, Poland
Jennie Si, USA
Youxian Sun, China
Joos Vandewalle, Belgium
DeLiang Wang, USA
Fei-Yue Wang, USA
Donald C. Wunsch II, USA
Lei Xu, China
Xin Yao, UK
Gary G. Yen, USA
Bo Zhang, China
Nanning Zheng, China
Jacek M. Zurada, USA

Steering Committee Chairs

Jun Wang, Hong Kong
Derong Liu, China

Steering Committee Members

Jinde Cao, China
Shumin Fei, China
Chengan Guo, China
Min Han, China
Zeng-Guang Hou, China
Xiaofeng Liao, China
Bao-Liang Lu, China
Fuchun Sun, China
Zhang Yi, China
Fuliang Yin, China
Hujun Yin, UK
Huaguang Zhang, China
Jianwei Zhang, Germany

Organizing Committee Chairs

Hongwei Wang, China
Jianzhong Zhou, China
Yi Shen, China

Program Committee Chairs

Wen Yu, Mexico
Haibo He, USA
Nian Zhang, USA

Special Sessions Chairs

Sanqing Hu, USA
Youshen Xia, China
Yunong Zhang, China

Publications Chairs

Xiaolin Hu, China
Minghui Jiang, China
Qingshan Liu, China

Publicity Chairs

Tingwen Huang, Qatar
Paul S. Pang, New Zealand
Changyin Sun, China

Finance Chair

Xiaoping Wang, China

Registration Chairs

Charlie C. L. Wang, China
Zhenyuan Liu, China
Weifeng Zhu, China

Local Arrangements Chairs

Zhigang Zeng, China
Chao Qi, China
Liu Hong, China

Program Committee Members

José Alfredo, Brazil
Sabri Arik, Turkey
Xindi Cai, USA
Yu Cao, USA
Matthew Casey, UK
Emre Celebi, USA
Jonathan Chan, Thailand
Sheng Chen, UK
Yangquan Chen, USA
Ji-Xiang Du, China
Hai-Bin Duan, China
Andries Engelbrecht, South Africa
Péter érdi, USA
Jufeng Feng, China
Chaojin Fu, China
Wai Keung Fung, Canada
Erol Gelenbe, UK
Xinping Guan, China
Chengan Guo, China
Ping Guo, China
Qing-Long Han, Australia
Hanlin He, China
Daniel Ho, Hong Kong
Zhongsheng Hou, China
Huosheng Hu, UK
Jinglu Hu, Japan
Junhao Hu, China
Marc van Hulle, Belgium
Danchi Jiang, Australia
Haijun Jiang, China
Shunshoku Kanae, Japan
Rhee Man Kil, Republic of Korea
Sungshin Kim, Korea
Arto Klami, Finland
Rakhesh Singh Kshetrimayum, India
Hon Keung Kwan, Canada
Chuangdong Li, China
Kang Li, UK
Li Li, China
Michael Li, Australia
Ping Li, Hong Kong
Shutao Li, China
Xiaoli Li, UK
Xiaoou Li, Mexico
Yangmin Li, Macao
Hualou Liang, USA
Jinling Liang, China
Wudai Liao, China
Alan Liew, Australia
Ju Liu, China
Li Liu, USA
Meiqin Liu, China
Wenxin Liu, USA
Yan Liu, USA
Jianquan Lu, Hong Kong
Jinhu Lu, China
Wenlian Lu, China
Jinwen Ma, China
Ikuko Nishkawa, Japan
Seiichi Ozawa, Japan
Jaakko Peltonen, Finland
Juan Reyes, Mexico
Jose de Jesus Rubio, Mexico
Eng. Sattar B. Sadkhan, Iraq
Gerald Schaefer, UK
Michael Small, Hong Kong
Qiankun Song, China
Humberto Sossa, Mexico
Bingyu Sun, China
Norikazu Takahashi, Japan
Manchun Tan, China
Ying Tan, China
Christos Tjortjjs, UK
Michel Verleysen, Belgium
Bing Wang, UK
Dan Wang, China
Dianhui Wang, Australia
Meiqing Wang, China
Rubin Wang, China
Xin Wang, China
Zhongsheng Wang, China
Jinyu Wen, China
Wei Wu, China
Degui Xiao, China
Rui Xu, USA
Yingjie Yang, UK
Kun Yuan, China
Xiaoqin Zeng, China
Jie Zhang, UK
Liqing Zhang, China

Publications Committee Members

Guici Chen	Zhikun Wang
Huangqiong Chen	Shiping Wen
Shengle Fang	Ailong Wu
Lizhu Feng	Yongbo Xia
Junhao Hu	Li Xiao
Feng Jiang	Weina Yang
Bin Li	Zhanying Yang
Yanling Li	Tianfeng Ye
Mingzhao Li	Hongyan Yin
Lei Liu	Lingfa Zeng
Xiaoyang Liu	Yongchang Zhang
Cheng Wang	Yongqing Zhao
Xiaohong Wang	Song Zhu

Technical Committee Members

Helena Aidos	Shan Chen
Antti Ajanki,	Sheng Chen
Tholkappia AraSu	Siyue Chen
Hyeon Bae	TianYu Chen
Tao Ban	Wei Chen
Li Bin	Xi Chen
Binghuang Cai	Xiaochi Chen
Lingru Cai	Xiaofeng Chen
Xindi Cai	XinYu Chen
Qiao Cai	Xiong Chen
Chao Cao	Xuedong Chen
Hua Cao	Yongjie Chen
Jinde Cao	Zongzheng Chen
Kai Cao	Hao Cheng
Wenbiao Cao	Jian Cheng
Yuan Cao	Long Cheng
George Cavalcanti	Zunshui Cheng
Lei Chang	Rong Chu
Mingchun Chang	Bianca di Angeli C.S. Costa
Zhai Chao	Jose Alfredo Ferreira Costa
Cheng Chen	Dadian Dai
Gang Chen	Jianming Dai
Guici Chen	Jayanta Kumar Debnath
Ke Chen	Spiros Denaxas
Jiao Chen	Chengnuo Deng
Lei Chen	Gang Deng
Ming Chen	Jianfeng Deng
Rongzhang Chen	Kangfa Deng

Zhipo Deng	Li Hong
Xiaohua Ding	Liu Hong
Xiuzhen Ding	Ruibing Hou
Zhiqiang Dong	Cheng Hu
Jinran Du	Jin Hu
Hongwu Duan	Junhao Hu
Lijuan Duan	Hao Hu
Xiaopeng Duan	Hui Hu
Yasunori Endo	Ruibin Hu
Andries Engelbrecht	Sanqing Hu
Tolga Ensari	Xiaolin Hu
Zhengping Fan	Xiaoyan Hu
Fang Fang	Chi Huang
Haitao Fang	Darong Huang
Yuanda Fang	Diqiu Huang
June Feng	Dongliang Huang
Lizhu Feng	Gan Huang
Yunqing Feng	Huayong Huang
Avgoustinos Filippoupolitis	Jian Huang
Liang Fu	Li Huang
Ruhai Fu	Qifeng Huang
Fang Gao	Tingwen Huang
Lei Gao	Zhangcan Huang
Ruiling Gao	Zhenkun Huang
Daoyuan Gong	Zhilin Huang
Xiangguo Gong	Rey-Chue Hwang
Fanji Gu	Sae Hwang
Haibo Gu	Hui Ji
Xingsheng Gu	Tianyao Ji
Lihe Guan	Han Jia
Jun Guo	Danchi Jiang
Songtao Guo	Shaobo Jiang
Xu Guo	Wei Jiang
Fengqing Han	Wang Jiao
Pei Han	Xianfa Jiao
Qi Han	Yiannis Kanellopoulos
Weiwei Han	Wenjing Kang
Yishan Han	Anthony Karageorgos
Yunpeng Han	Masanori KaWakita
Hanlin He	Haibin Ke
Jinghui He	Seong-Joo Kim
Rui He	Peng Kong
Shan He	Zhanghui Kuang
Tonejun He	Lingcong Le
Tongjun He	Jong Min Lee
Wangli He	Liu Lei
Huosheng Hu	Siyu Leng

Bing Li
Changping Li
Chuandong Li
Hui Li
Jian Li
Jianmin Li
Jianxiang Li
Kelin Li
Kezan Li
Lei Li
Li Li
Liping Li
Lulu Li
Ming Li
Na Li
Ping Li
Qi Li
Song Li
Weiqun Li
Wenlong Li
Wentian Li
Shaokang Li
Shiying Li
Tian Li
Wei Li
Wu Li
Xiang Li
Xiaoli Li
Xiaoou Li
Xin Li
Xinghai Li
Xiumin Li
Yanlin Li
Yanling Li
Yong Li
Yongfei Li
Yongmin Li
Yuechao Li
Zhan Li
Zhe Li
Jinling Liang
Wudai Liao
Wei Lin
Zhihao Lin
Yunqing Ling
Alex Liu
Bo Liu
Da Liu
Dehua Li
Dayuan Liu
Dongbing Liu
Desheng Liu
F. C. Liu
Huaping Liu
Jia Liu
Kangqi Liu
Li Liu
Ming Liu
Qian Liu
Qingshan Liu
Shangjin Liu
Shenquan Liu
Shi Liu
Weiqi Liu
Xiaoyang Liu
Xiuquan Liu
Xiwei Liu
XinRong Liu
Yan Liu
Yang Liu
Yawei Liu
Yingju Liu
Yuxi Liu
Zhenyuan Liu
Zijian Liu
Yimin Long
Georgios Loukas
Jinhu Lu
Jianquan Lu
Wen Lu
Wenlian Lu
Wenqian Lu
Tongting Lu
Qiuming Luo
Xucheng Luo
Chaohua Ma
Jie Ma
Liefeng Ma
Long Ma
Yang Ma
Zhiwei Ma
Xiaoou Mao
Xuehui Mei
Xiangpei Meng

Xiangyu Meng
Zhaohui Meng
Guo Min
Rui Min
Yuanneng Mou
Junichi Murata
Puyan Nie
Xiushan Nie
Gulay Oke
Ming Ouyang
Yao Ouyang
Seiichi Ozawa
Neyir Ozcan
Joni Pajarinen
Hongwei Pan
Linqiang Pan
Yunpeng Pan
Tianqi Pang
Kyungseo Park
Xiaohan Peng
Zaiyun Peng
Gao Pingan
Liquan Qiu
Jianlong Qiu
Tapani Raiko
Congjun Rao
Fengli Ren
Jose L. Rosseilo
Gongqin Ruan
Quan Rui
Sattar B. Sadkhan
Renato Jose Sassi Sassi
Sibel Senan
Sijia Shao
Bo Shen
Enhua Shen
Huayu Shen
Meili Shen
Zifei Shen
Dianyang Shi
Jinrui Shi
Lisha Shi
Noritaka Shigei
Atsushi Shimada
Jiaqi Song
Wen Song
Yexin Song
Zhen Song
Zhu Song
Gustavo Fontoura de Souza
Kuo-Ho Su
Ruiqi Su
Cheng Sun
Dian Sun
Junfeng Sun
Lisha Sun
Weipeng Sun
Yonghui Sun
Zhaowan Sun
Zhendong Sun
Manchun Tan
Xuehong Tan
Yanxing Tan
Zhiguo Tan
Bing Tang
Hao Tang
Yili Tang
Gang Tian
Jing Tian
Yuguang Tian
Stelios Timotheou
Shozo Tokinaga
Jun Tong
Joaquin Torres Sospedra
Hiroshi Wakuya
Jin Wan
B.H. Wang
Cheng Wang
Fan Wang
Fen Wang
Gang Wang
Gaoxia Wang
Guanjun Wang
Han Wang
Heding Wang
Hongcui Wang
Huayong Wang
Hui Wang
Huiwei Wang
Jiahai Wang
Jian Wang
Jin Wang
Juzhi Wang
Kai Wang

Lan Wang	Zhiguo Xia
Lili Wang	Xun Xiang
Lu Wang	Chengcheng Xiao
Qilin Wang	Donghua Xiao
Qingyun Wang	Jiangwen Xiao
Suqin Wang	Yongkang Xiao
Tian Wang	Yonkang Xiao
Tianxiong Wang	Yong Xie
Tonghua Wang	Xiaofei Xie
Wei Wang	Peng Xin
Wenjie Wang	Chen Xiong
Xiao Wang	Jinghui Xiong
Xiaoping Wang	Wenjun Xiong
Xiong Wang	Anbang Xu
Xudong Wang	Chen Xu
Yang Wang	Hesong Xu
Yanwei Wang	Jianbing Xu
Yao Wang	Jin Xu
Yiping Wang	Lou Xu
Yiyu Wang	Man Xu
Yue Wang	Xiufen Yu
Zhanshan Wang	Yan Xu
Zhengxia Wang	Yang Xu
Zhibo Wang	Yuanlan Xu
Zhongsheng Wang	Zhaodong Xu
Zhihui Wang	Shujing Yan
Zidong Wang	Dong Yang
Zhuo Wang	Fan Yang
Guoliang Wei	Gaobo Yang
Li Wei	Lei Yang
Na Wei	Sihai Yang
Shuang Wei	Tianqi Yang
Wenbiao Wei	Xiaolin Yang
Yongchang Wei	Xing Yang
Xiaohua Wen	Xue Yang
Xuexin Wen	Yang Yang
Junmei Weng	Yongqing Yang
Yixiang Wu	Yiwen Yang
You Wu	Hongshan Yao
Huaiqin Wu	John Yao
Zhihai Wu	Xianfeng Ye
Bin Xia	Chenfu Yi
Weiguo Xia	Aihua Yin
Yonghui Xia	Lewen Yin
Youshen Xia	Qian Yin
Zhigu Xia	Yu Ying

Xu Yong
Yuan You
Shuai You
Chenglong Yu
Liang Yu
Lin Yu
Liqiang Yu
Qing Yu
Yingzhong Yu
Zheyi Yu
Jinhui Yuan
Peijiang Yuan
Eylem Yucel
Si Yue
Jianfang Zeng
Lingjun Zeng
Ming Zeng
Yi Zeng
Zeyu Zhang
Zhigang Zeng
Cheng Zhang
Da Zhang
Hanling Zhang
Haopeng Zhang
Kaifeng Zhang
Jiacai Zhang
Jiajia Zhang
Jiangjun Zhang
Jifan Zhang
Jinjian Zhang
Liming Zhang
Long Zhang
Qi Zhang
Rui Zhang
Wei Zhang
Xiaochun Zhang
Xiong Zhang
Xudong Zhang
Xuguang Zhang
Yang Zhang
Yangzhou Zhang
Yinxue Zhang
Yunong Zhang
Zhaoxiong Zhang

YuanYuan
Bin Zhao
Jin Zhao
Le Zhao
Leina Zhao
Qibin Zhao
Xiaquan Zhao
Zhenjiang Zhao
Yue Zhen
Changwei Zheng
Huan Zheng
Lina Zheng
Meijun Zheng
Quanchao Zheng
Shitao Zheng
Ying Zheng
Xun Zheng
Lingfei Zhi
Ming Zhong
Benhai Zhou
Jianxiang Zhou
Jiao Zhou
Jin Zhou
Jinnong Zhou
Junming Zhou
Lin Zhou
Rong Zhou
Song Zhou
Xiang Zhou
Xiuling Zhou
Yiduo Zhou
Yinlei Zhou
Yuan Zhou
Zhenqiao Zhou
Ze Zhou
Zhouliu Zhou
Haibo Zhu
Ji Zhu
Jiajun Zhu
Tanyuan Zhu
Zhenqian Zhu
Song Zhu
Xunlin Zhu
Zhiqiang Zuo

Table of Contents – Part II

Fuzzy Systems and Fuzzy Neural Networks

Online FCMAC-BYY Model with Sliding Window	1
<i>Jiacai Fu, Thi Tra Giang Dang, Minh Nhut Nguyen, and Daming Shi</i>	
Automated Sealed-Bid Negotiation Model for Multi-issue Based on Fuzzy Method	7
<i>Linlan Zhang, Haigang Song, and Xueguang Chen</i>	
Fuzzy Two-Stage Supply Chain Problem and Its Intelligent Algorithm.	15
<i>Guoli Wang, Yankui Liu, and Mingfa Zheng</i>	
Modeling Fuzzy DEA with Type-2 Fuzzy Variable Coefficients	25
<i>Rui Qin, Yankui Liu, Zhiqiang Liu, and Guoli Wang</i>	
Research on Fuzzy Control Methods for Suspension Density and Liquid Levels in Dense-Medium Separation	35
<i>Yang Xiang</i>	
Fuzzy Chance-Constrained Goal Programming Model and Algorithm of Oilfield Measures	43
<i>Jiekun Song, Jiepeng Song, Yu Zhang, Zaiyu Zhang, and Shuiqing Fan</i>	
Concept Lattices in L-Rough Sets	50
<i>Xueyou Chen</i>	
Project Scheduling Problem for Software Development with Random Fuzzy Activity Duration Times	60
<i>Wei Huang, Lixin Ding, Bin Wen, and Buqing Cao</i>	
Intelligent Client-Side Web Caching Scheme Based on Least Recently Used Algorithm and Neuro-Fuzzy System	70
<i>Waleed Ali and Siti Mariyam Shamsuddin</i>	
The Expected Value of Imperfect Information to Fuzzy Programming	80
<i>Mingfa Zheng, Guoli Wang, Guangxing Kou, and Jia Liu</i>	
Rule Extraction and Reduction for Hyper Surface Classification	88
<i>Qing He, Jincheng Li, and Zhongzhi Shi</i>	

An Online Self-constructing Fuzzy Neural Network with Restrictive Growth	99
<i>Ning Wang, Xianyao Meng, Meng Joo Er, Xinjie Han, Song Meng, and Qingyang Xu</i>	
Study on the Offset Color Reproduction Control System Based on Fuzzy Neural Network	109
<i>Liming Guan and Jian Lin</i>	
A Proposal of Fuzzy Inference Model Composed of Small-Number-of-Input Rule Modules	118
<i>Noritaka Shigei, Hiromi Miyajima, and Shinya Nagamine</i>	
Fuzzy Radial Basis Function Neural Networks with Information Granulation and Its Genetic Optimization	127
<i>Jeoung-Nae Choi, Young-Il Lee, and Sung-Kwon Oh</i>	
Fuzzy C-Means Cluster Segmentation Algorithm Based on Modified Membership	135
<i>Yanling Li and Gang Li</i>	
A Study on Improved Fuzzy Neural Network Controller for Air-Condition with Frequency Change	145
<i>Shuqing Wang, Zipeng Zhang, Zhihuai Xiao, and Xiaohui Yuan</i>	
Fuzzy Neural Network Based on Improved T-S Model and Its Application	155
<i>Zhiwei Huang, Jianzhong Zhou, Chaoshun Li, Fengpan Li, and Yongchuan Zhang</i>	
Application of Artificial Intelligence Technique in Distributed Generation System	165
<i>Guoqing Weng, Youbing Zhang, and Yi Hu</i>	
An ANFIS Based Fuzzy Synthesis Judgment for Transformer Fault Diagnosis	172
<i>Hongsheng Su, Xiuhua Wang, and Hao Chen</i>	
Fusion Algorithm Based on the Intuitionistic Fuzzy Set and Multiple Neural Network	182
<i>Jun Zhi, Jianyong Liu, Wei Xu, and Limin Zhi</i>	
Supporting E-Learning System with Modified Bayesian Rough Set Model	192
<i>Ayad R. Abbas and Liu Juan</i>	
Fuzzy Neural Network with a Fuzzy Learning Rule Emphasizing Data Near Decision Boundary	201
<i>Yong Soo Kim</i>	

Investigation of Fuzzy Adaptive Resonance Theory in Network Anomaly Intrusion Detection	208
<i>Nawa Ngamwithhayanon, Naruemon Wattanapongsakorn, and David W. Coit</i>	
Stability of Switched Cellular Neural Networks with Flat Fuzzy Feedback Min and Max Templates	218
<i>Jinhua Huang and Jiqing Liu</i>	
Support Vector Machines and Kernel Methods	
Analog Circuit Fault Fusion Diagnosis Method Based on Support Vector Machine	225
<i>Zhihong Feng, Zhigui Lin, Wei Fang, Wei Wang, and Zhitao Xiao</i>	
Aeroengine Turbine Exhaust Gas Temperature Prediction Using Support Vector Machines	235
<i>Xuyun Fu, Gang Ding, and Shisheng Zhong</i>	
A Short-Term Load Forecasting Model Based on LS-SVM Optimized by Dynamic Inertia Weight Particle Swarm Optimization Algorithm	242
<i>Dongxiao Niu, Bingen Kou, Yunyun Zhang, and Zhihong Gu</i>	
A Maximum Class Distance Support Vector Machine-Based Algorithm for Recursive Dimension Reduction	251
<i>Zheng Sun, Xiaoguang Zhang, Dianxu Ruan, and Guiyun Xu</i>	
Extraction of the Reduced Training Set Based on Rough Set in SVMs	259
<i>Hongbing Liu, Shengwu Xiong, and Qiong Chen</i>	
An Improved Support Vector Machine Classifier for EEG-Based Motor Imagery Classification	267
<i>Hui Zhou, Qi Xu, Yongji Wang, Jian Huang, and Jun Wu</i>	
Cooperative Recurrent Neural Network for Multiclass Support Vector Machine Learning	276
<i>Ying Yu, Youshen Xia, and Mohamed Kamel</i>	
Selective Ensemble Algorithms of Support Vector Machines Based on Constraint Projection	287
<i>Lei Wang and Yong Yang</i>	
Finite Element Model Updating Based on Least Squares Support Vector Machines	296
<i>Yue Zhu and Lingmi Zhang</i>	
Polarization Radar HRRP Recognition Based on Kernel Methods	304
<i>Liya Li, Hongwei Liu, Bo Jiu, and Shunjun Wu</i>	

Robust Unsupervised and Semi-supervised Bounded ν – Support Vector Machines	312
<i>Kun Zhao, Ying-jie Tian, and Nai-yang Deng</i>	
Time Series Prediction Based on Generalization Bounds for Support Vector Machine	322
<i>Liming Yang, Laisheng Wang, Yitian Xu, and Qun Sun</i>	
A Parallel Implementation of Error Correction SVM with Applications to Face Recognition	327
<i>Qingshan Yang and Chengan Guo</i>	
Effective Detection of the Alzheimer Disease by Means of Coronal NMSE SVM Feature Classification	337
<i>Javier Ramírez, Rosa Chaves, Juan M. Górriz, Ignacio Álvarez, Diego Salas-Gonzalez, Míriam López, and Fermín Segovia</i>	
Probabilistic Ranking Support Vector Machine	345
<i>Nguyen Thi Thanh Thuy, Ngo Anh Vien, Nguyen Hoang Viet, and TaeChoong Chung</i>	
Classification of Single-Trial EEG Based on Support Vector Clustering during Finger Movement	354
<i>Boyu Wang and Feng Wan</i>	
Study of Double SMO Algorithm Based on Attributes Reduction	364
<i>Chen Chen, Liu Hong, Haigang Song, Xueguang Chen, and TieMin Hou</i>	
Classification of Hepatic Tissues from CT Images Based on Texture Features and Multiclass Support Vector Machines	374
<i>Luyao Wang, Zhi Zhang, Jingjing Liu, Bo Jiang, Xiyao Duan, Qingguo Xie, Daoyu Hu, and Zhen Li</i>	
Immune Particle Swarm Optimization for Support Vector Regression on Forest Fire Prediction	382
<i>Yan Wang, Juexin Wang, Wei Du, Chuncai Wang, Yanchun Liang, Chunguang Zhou, and Lan Huang</i>	
Artificial Neural Network and Hidden Space SVM for Fault Detection in Power System	391
<i>Qian Wang</i>	
Reordering Sparsification of Kernel Machines in Approximate Policy Iteration	398
<i>Chunming Liu, Jinze Song, Xin Xu, and Pengcheng Zhang</i>	
Three-State Financial Distress Prediction Based on Support Vector Machine	408
<i>Hongshan Yao</i>	

Wavelet Neural Networks and Support Vector Machine for Financial Distress Prediction Modelling: The Chinese Case	416
<i>Hongshan Yao</i>	

Genetic Algorithms

Grooming of Dynamic Traffic in WDM Tree Networks Using Genetic Algorithms	424
<i>Shutong Xie, Yinbiao Guo, Yong Xu, and Kunhong Liu</i>	
A GA-Based Approach to ICA Feature Selection: An Efficient Method to Classify Microarray Datasets	432
<i>Kun-Hong Liu, Jun Zhang, Bo Li, and Ji-Xiang Du</i>	
A Hybrid Algorithm of GA Wavelet-BP Neural Networks to Predict Near Space Solar Radiation	442
<i>Jianmin Su, Bifeng Song, and Baofeng Li</i>	
Research a Novel Optimization Mechanism of Parameters Based on Hybrid NN and GA	451
<i>Yansong Liu, Rulong Wang, and Gang Yi</i>	
A Novel Hybrid Evolution Algorithm Based on Agent Behavior and Paradigm Learning	461
<i>Yuhui Xu and Weijin Jiang</i>	
An Effective Hybrid GA–PP Strategy for Artificial Neural Network Ensemble and Its Application Stock Market Forecasting	470
<i>Chunmei Wu and Jiansheng Wu</i>	
An Effective Dimension Reduction Approach to Chinese Document Classification Using Genetic Algorithm	480
<i>Zhishan Guo, Li Lu, Shijia Xi, and Fuchun Sun</i>	
Dynamic Structure-Based Neural Networks Determination Approach Based on the Orthogonal Genetic Algorithm with Quantization	490
<i>Hao Rao and Lining Xing</i>	
A Novel Weight-Based Immune Genetic Algorithm for Multiobjective Optimization Problems	500
<i>Guixia He and Jiaquan Gao</i>	
Proportional Fair Scheduling Based on Genetic Algorithms for Multi-user MIMO Systems	510
<i>Peng Shang, Gang Su, Guangxi Zhu, and Li Tan</i>	
Enhance Neural Networks Training Using GA with Chaos Theory	520
<i>K.Y. Leong, Augustina Sitiol, and Kalaiarasi Sonai Muthu Anbananthen</i>	

Study on the GA-Based Decoding Algorithm for Convolutional Turbo Codes	530
<i>Xingcheng Liu, Shishuang Zhang, and Zerong Deng</i>	
Economic Power Dispatch with Environmental Constraints Using a Novel Hybrid Evolutionary Programming	537
<i>Gonggui Chen, Yinhong Li, and Xianzhong Duan</i>	
Use of Ensemble Based on GA for Imbalance Problem	547
<i>Laura Cleofas, Rosa Maria Valdovinos, Vicente García, and Roberto Alejo</i>	
Research and Application of Urban Logistics Demand Forecast Based on High Speed and Precise Genetic Algorithm Neural Network.....	555
<i>Jingwen Tian, Meijuan Gao, and Fan Zhang</i>	
Solving Traveling Salesman Problem by Using an Evolutionary Algorithm Based on the Local Search Strategy.....	564
<i>Xuan Wang, Gan-nian Zhang, and Yuan-xiang Li</i>	
Application of Multi-objective Particle Swarm Optimization Algorithm in Integrated Marketing Method Selection.....	572
<i>Qiwan Wang</i>	
Genetic Algorithm and Tabu Search Hybrid Algorithm to Co-scheduling Model of Three Gorges-Gezhou Dam	581
<i>Xiaoping Wang and Qian Ruan</i>	
Two-Phase Dynamic Reactive Power Optimization Based on Improved Genetic Algorithm	591
<i>Bu-han Zhang, Kai Wang, Chao Yang, Yan Li, Cheng-xiong Mao, Xin-bo Ruan, Yong-feng Yao, and Hong-xian Hu</i>	
Transmission Network Planning Based on Multi-objective Evolutionary Algorithm of Transportation Theory.....	601
<i>Huang Ping, Zhang Yao, Li Pengcheng, and Li Kangshun</i>	
Transmission Network Expansion Planning Based on Mind Evolutionary Computation	611
<i>Yaowu Wu, Suhua Lou, Yu Liu, and Nan Zhang</i>	
 Clustering and Classification	
SMVLE: An Efficient Dimension Reduction Scheme	621
<i>Heyong Wang</i>	
Classification Algorithm Based on Feature Selection and Samples Selection	631
<i>Yitian Xu, Ling Zhen, Liming Yang, and Laisheng Wang</i>	

A Novel Fuzzy-Based Automatic Speaker Clustering Algorithm	639
<i>Haipeng Wang, Xiang Zhang, Hongbin Suo, Qingwei Zhao, and Yonghong Yan</i>	
A New Method for Substation Planning Problem Based on Weighted K-Means	647
<i>Wen Peng and Wenxia Liu</i>	
Two-Dimensional Maximum Clustering-Based Scatter Difference Discriminant Analysis for Synthetic Aperture Radar Automatic Target Recognition	655
<i>Liping Hu, Hongwei Liu, and Shunjun Wu</i>	
Adaptive Hybrid Differential Evolution Algorithm and Its Application in Fuzzy Clustering	664
<i>Youlin Lu, Jianzhong Zhou, Hui Qin, Chaoshun Li, and Yinghai Li</i>	
Geometric Manifold Energy and Manifold Clustering	674
<i>Hongyu Li, Qiyong Guo, Jinyuan Jia, and Jussi Parkkinen</i>	
An Enhanced Swarm Intelligence Clustering-Based RBF Neural Network Web Text Classifier	684
<i>Yong Feng, Zhongfu Wu, Jiang Zhong, Chunxiao Ye, and Kaigui Wu</i>	
Textile Flaw Classification by Wavelet Reconstruction and BP Neural Network	694
<i>Yean Yin, Ke Zhang, and WenBing Lu</i>	
Enterprise Cluster Knowledge Disseminate in Small-World Network	702
<i>Jian Tan and Xianjia Wang</i>	
Fuzzy Document Clustering Based on Ant Colony Algorithm	709
<i>Fei Wang, Dexian Zhang, and Na Bao</i>	
On ACO-Based Fuzzy Clustering for Image Segmentation	717
<i>Zhiding Yu, Weiyu Yu, Ruobing Zou, and Simin Yu</i>	
Web Page Clustering via Partition Adaptive Affinity Propagation	727
<i>Changyin Sun, Yifan Wang, and Haina Zhao</i>	
Pipelined Genetic Algorithm Initialized RAN Based RBF Modulation Classifier	737
<i>Fuqiang Xue, Lindong Ge, and Bin Wang</i>	
Community Intrusion Detection System Based on Radial Basic Probabilistic Neural Network	745
<i>Meijuan Gao, Jingwen Tian, and Shiru Zhou</i>	
Web Text Categorization for Enterprise Decision Support Based on SVMs – An Application of GBODSS	753
<i>Zhijuan Jia, Mingsheng Hu, Haigang Song, and Liu Hong</i>	

Age Classification System with ICA Based Local Facial Features	763
<i>Hang Qi and Liqing Zhang</i>	
Boosting Local Naïve Bayesian Rules	773
<i>Zhipeng Xie</i>	
Incorporating Prior Knowledge into Task Decomposition for Large-Scale Patent Classification	784
<i>Chao Ma, Bao-Liang Lu, and Masao Utiyama</i>	
SDCC: A New Stable Double-Centroid Clustering Technique Based on K-Means for Non-spherical Patterns	794
<i>Juifang Chang</i>	
Weighting Individual Classifiers by Local Within-Class Accuracies.	802
<i>Shiliang Sun</i>	
Heuristic Search for Cluster Centroids: An Ant-Based Approach for FCM Initialization	810
<i>Zhiding Yu, Ruobing Zou, and Simin Yu</i>	
Pattern Recognition	
Multi Lingual Character Recognition Using Hierarchical Rule Based Classification and Artificial Neural Network	821
<i>Anupam Shukla, Ritu Tiwari, Anand Ranjan, and Rahul Kala</i>	
Research of Palmprint Recognition Based on 2DPCA	831
<i>Huifeng Sang, Weiqi Yuan, and Zhijia Zhang</i>	
Research on Logging Evaluation of Reservoir Contamination Based on PSO-BP Neural Network.	839
<i>Tao Li, Libo Guo, Yuanmei Wang, Feng Hu, Li Xiao, Yanwu Wang, and Qin Cheng</i>	
WSFI-Mine: Mining Frequent Patterns in Data Streams	845
<i>Younghee Kim and Ungmo Kim</i>	
Polyphone Recognition Using Neural Networks	853
<i>Lishu Li, Qinghua Chen, Jiawei Chen, and Fukang Fang</i>	
A Novel Moving Object Tracking Method Using ICA-R	859
<i>Xiaohong Ma, Lixin Wang, Yi Feng, and Hualou Liang</i>	
Mining Sequential Patterns in Data Stream	865
<i>Qinhua Huang and Weimin Ouyang</i>	
Application of Passive Estimation and Track of Target Depth in Submarine Recognition	875
<i>Zhong Liu, Jun Xing, Pengfei Peng, and Xuezhi Fu</i>	

Higher Order Neurodynamics of Associative Memory for Sequential Patterns	886
<i>Hiromi Miyajima, Noritaka Shigei, and Shuji Yatsuki</i>	
Expression Recognition Based on Multi-scale Block Local Gabor Binary Patterns with Dichotomy-Dependent Weights	895
<i>Zheng Zhang, Zheng Zhao, and Tiantian Yuan</i>	
Analysis on a Non-repudiable Threshold Proxy Signature Scheme with Known Signers	904
<i>Gang Li, Yanling Li, and Chuanda Qi</i>	
Neural Network Based Landscape Pattern Simulation in ChangBai Mountain, Northeast China	911
<i>Mingchang Wang, Shengbo Chen, Lixin Xing, Chunyan Yang, and Zijun Wang</i>	
A New Quantization Improvement of SPIHT for Wavelet Image Coding	921
<i>Wentao Wang, Guoyou Wang, and Tianxu Zhang</i>	
Research on Segment Acoustic Model Based Mandarin LVCSR	928
<i>Wenju Liu, Yun Tang, and Shouye Peng</i>	
Accelerating Segment Model Decoding for LVCSR by Parallel Processing of Neighboring Segments	936
<i>Shouye Peng, Wen-Ju Liu, and Hua Zhang</i>	
Iris Image Analysis Based on Affinity Propagation Algorithm	943
<i>Huabiao Xiao and Ping Guo</i>	
Iris Feature Extraction Based on the Complete 2DPCA	950
<i>Xiuli Xu and Ping Guo</i>	
A Single Loop EM Algorithm for the Mixture of Experts Architecture	959
<i>Yan Yang and Jinwen Ma</i>	
The Research and Implementation of Grid Based Data Mining Architecture	969
<i>Jingwen Gong, Yu Wang, Haigang Song, Xueguang Chen, and Qihua Zhang</i>	
Geometric Associative Processing Applied to Pattern Classification	977
<i>Benjamín Cruz, Humberto Sossa, and Ricardo Barrón</i>	
Integrated Radial Basis Function Networks with Adaptive Residual Subsampling Training Method for Approximation and Solving PDEs . . .	986
<i>Hong Chen and Li Kong</i>	

Ensembles of Feature Subspaces for Object Detection	996
<i>Shiliang Sun</i>	

Intelligent Control

Feedback Control in General Complex Delayed Dynamical Networks	1005
<i>Lilan Tu</i>	
Design, Simulation and Implementation of a Fuzzy-PID Controller for Controlling a DC-DC Converter	1013
<i>Mohammad Jafari and Zahra Malekjamshidi</i>	
Neural Network Control for a Class of Stochastic Nonlinear Switched System Based on Backstepping	1023
<i>Sheng Zhang and Fei Long</i>	
Neural Networks Sliding Mode Control for a Class of Switched Nonlinear Systems	1032
<i>Sheng Zhang and Fei Long</i>	
CMAC-Based PID Control of an XY Parallel Micropositioning Stage . . .	1040
<i>Qingsong Xu and Yangmin Li</i>	
New MPPT Controller Design for PV Arrays Using Neural Networks (Zanjan City Case Study)	1050
<i>Mehran Habibi and Alireza Yazdizadeh</i>	
Neural Network-Based IMC-PID Controller Design for Main Steam Temperature of a Power Plant	1059
<i>Mehdi Abbaszadeh Naseri and Alireza Yazdizadeh</i>	
Study on Steering Control Strategy of Electric Vehicles Driven by Hub-Motors	1069
<i>Yong Chen, Zhongkui Lu, and Daming Zhang</i>	
Temperature Control in Cement Rotary Kiln with Neural Network-Based Heuristic Dynamic Programming	1078
<i>Xiaofeng Lin, Tangbo Liu, Deguang Cao, and Qingbao Huang</i>	
Study of Iterative Learning Control Algorithm Based on Neural Network	1087
<i>Xisheng Zhan, Jie Wu, and Xianhe Zhang</i>	
On-Line Tuning of a Neural PID Controller Based on Variable Structure RBF Network	1094
<i>Jianchuan Yin, Gexin Bi, and Fang Dong</i>	
Circle Formation Control of Large-Scale Intelligent Swarm Systems in a Distributed Fashion	1105
<i>Zhibin Xue and Jianchao Zeng</i>	

B-Spline Output Feedback Control for Nonlinear Systems	1116
<i>Yih-Guang Leu, Jian-You Lin, and Chun-Yao Chen</i>	
Adaptive Backstepping Fuzzy Control for a Class of Nonlinear Systems	1123
<i>Yih-Guang Leu and Jian-You Lin</i>	
Control the Complex Networks with Different Dynamical Nodes by Impulse	1130
<i>Qunjiao Zhang and Junan Lu</i>	
Fuzzy Immune PID Temperature Control of HVAC Systems	1138
<i>Desheng Liu, Zhiru Xu, Qingjun Shi, and Jingguo Zhou</i>	
Improved Object Tracking Algorithm Based on New HSV Color Probability Model	1145
<i>Gang Tian, Ruimin Hu, Zhongyuan Wang, and Youming Fu</i>	
Research on the Reconfigurable Implementation of Neural Network Controller Based on FPGA for DC-DC Converters	1152
<i>Yanxia Shen, Tai Li, and Zhicheng Ji</i>	
Synchronization between Two Different Hyperchaotic Dynamical Systems Using Nonlinear Control	1160
<i>Lei Wang and Yong Xu</i>	
Chaos Control of Lorenz System Using Small Gain Theorem	1165
<i>Lei Wang, Jian-Hao Xu, and Ti-Biao Wang</i>	
The Impulsive Control of Cluster Synchronization in Coupled Dynamical Networks	1171
<i>Yanhong Zhao and Yongqing Yang</i>	
Synchronization between Two Different Chaotic Neural Networks with Fully Unknown Parameters	1180
<i>Yinghui Xie, Zengqi Sun, and Fushan Wang</i>	
Adaptive Neural-Based Fuzzy Inference System Approach Applied to Steering Control	1189
<i>Wang Minghui, Yu Yongquan, and Lin Wei</i>	
Synchronization and Lag Synchronization of Chaotic Networks	1197
<i>Zunshui Cheng, Youming Xin, Xuechen Li, and Jianmin Xing</i>	
Author Index	1203