

Lipo Wang
Ke Chen
Yew Soon Ong (Eds.)

LNC3611

Advances in Natural Computation

First International Conference, ICNC 2005
Changsha, China, August 2005
Proceedings, Part II

2
Part II



Springer

2301.6-53
1.7
001
1.2

Lipo Wang Ke Chen Yew Soon Ong (Eds.)

Advances in Natural Computation

First International Conference, ICNC 2005
Changsha, China, August 27-29, 2005
Proceedings, Part II



E200502095



Springer

Volume Editors

Lipo Wang
Nanyang Technological University
School of Electrical and Electronic Engineering
Block S1, 50 Nanyang Avenue, Singapore 639798
E-mail: elpwang@ntu.edu.sg

Ke Chen
University of Manchester
School of Informatics
P.O. Box 88, Sackville St., Manchester M60 1QD, UK
E-mail: k.chen@manchester.ac.uk

Yew Soon Ong
Nanyang Technological University
School of Computer Engineering
Blk N4, 2b-39, Nanyang Avenue, Singapore 639798
E-mail: asysong@ntu.edu.sg

Library of Congress Control Number: Applied for

CR Subject Classification (1998): F.1, F.2, I.2, G.2, I.4, I.5, J.3, J.4

ISSN	0302-9743
ISBN-10	3-540-28325-0 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-28325-6 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 is a part of Springer Science+ Business Media
springeronline.com

© Springer-Verlag Berlin Heidelberg 2005
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11539117 06/3142 5 4 3 2 1 0

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

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

New York University, NY, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Preface

This book and its sister volumes, i.e., LNCS vols. 3610, 3611, and 3612, are the proceedings of the 1st International Conference on Natural Computation (ICNC 2005), jointly held with the 2nd International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2005, LNAI vols. 3613 and 3614) from 27 to 29 August 2005 in Changsha, Hunan, China. In its budding run, ICNC 2005 successfully attracted 1887 submissions from 32 countries/regions (the joint ICNC-FSKD 2005 received 3136 submissions). After rigorous reviews, 502 high-quality papers, i.e., 313 long papers and 189 short papers, were included in the ICNC 2005 proceedings, representing an acceptance rate of 26.6%.

The ICNC-FSKD 2005 featured the most up-to-date research results in computational algorithms inspired from nature, including biological, ecological, and physical systems. It is an exciting and emerging interdisciplinary area in which a wide range of techniques and methods are being studied for dealing with large, complex, and dynamic problems. The joint conferences also promoted cross-fertilization over these exciting and yet closely-related areas, which had a significant impact on the advancement of these important technologies. Specific areas included neural computation, quantum computation, evolutionary computation, DNA computation, chemical computation, information processing in cells and tissues, molecular computation, computation with words, fuzzy computation, granular computation, artificial life, swarm intelligence, ants colonies, artificial immune systems, etc., with innovative applications to knowledge discovery, finance, operations research, and more. In addition to the large number of submitted papers, we were blessed with the presence of four renowned keynote speakers and several distinguished panelists.

On behalf of the Organizing Committee, we thank Xiangtan University for sponsorship, and the IEEE Circuits and Systems Society, the IEEE Computational Intelligence Society, and the IEEE Control Systems Society for technical co-sponsorship. We are grateful for the technical cooperation from the International Neural Network Society, the European Neural Network Society, the Chinese Association for Artificial Intelligence, the Japanese Neural Network Society, the International Fuzzy Systems Association, the Asia-Pacific Neural Network Assembly, the Fuzzy Mathematics and Systems Association of China, and the Hunan Computer Federation. We thank the members of the Organizing Committee, the Advisory Board, and the Program Committee for their hard work in the past 18 months. We wish to express our heartfelt appreciation to the keynote and panel speakers, special session organizers, session chairs, reviewers, and student helpers. Our special thanks go to the publisher, Springer, for publishing the ICNC 2005 proceedings as three volumes of the Lecture Notes in Computer Science series (and the FSKD 2005 proceedings as two volumes of the Lecture Notes in Artificial Intelligence series). Finally, we thank all the authors and par-

ticipants for their great contributions that made this conference possible and all the hard work worthwhile.

August 2005

Lipo Wang
Ke Chen
Yew Soon Ong

Organization

ICNC 2005 was organized by Xiangtan University and technically co-sponsored by the IEEE Circuits and Systems Society, the IEEE Computational Intelligence Society, and the IEEE Control Systems Society, in cooperation with the International Neural Network Society, the European Neural Network Society, the Chinese Association for Artificial Intelligence, the Japanese Neural Network Society, the International Fuzzy Systems Association, the Asia-Pacific Neural Network Assembly, the Fuzzy Mathematics and Systems Association of China, and the Hunan Computer Federation.

Organizing Committee

Honorary Conference Chairs

General Chair
General Co-chairs

Program Chairs

Local Arrangements Chairs

Proceedings Chair
Publicity Chair
Sponsorship/Exhibits Chairs

Webmasters

Shun-ichi Amari, Japan

Lotfi A. Zadeh, USA

He-An Luo, China

Lipo Wang, Singapore

Yunqing Huang, China

Ke Chen, UK

Yew Soon Ong, Singapore

Renren Liu, China

Xieping Gao, China

Fen Xiao, China

Hepu Deng, Australia

Shaoping Ling, China

Geok See Ng, Singapore

Linai Kuang, China

Yanyu Liu, China

Advisory Board

Toshio Fukuda, Japan

Kunihiko Fukushima, Japan

Tom Gedeon, Australia

Aike Guo, China

Zhenya He, China

Janusz Kacprzyk, Poland

Nikola Kasabov, New Zealand

John A. Keane, UK

Soo-Young Lee, Korea

Erkki Oja, Finland

Nikhil R. Pal, India

Witold Pedrycz, Canada

Jose C. Principe, USA

Harold Szu, USA

Shiro Usui, Japan

Xindong Wu, USA

Lei Xu, Hong Kong

Xin Yao, UK

Syozo Yasui, Japan

Bo Zhang, China

Yixin Zhong, China

Jacek M. Zurada, USA

Program Committee

- Shigeo Abe, Japan
Kazuyuki Aihara, Japan
Davide Anguita, Italy
Abdesselam Bouzerdoun, Australia
Gavin Brown, UK
Laiwan Chan, Hong Kong
Sheng Chen, UK
Shu-Heng Chen, Taiwan
YanQiu Chen, China
Vladimir Cherkassky, USA
Sung-Bae Cho, Korea
Sungzoon Cho, Korea
Vic Ciesielski, Australia
Keshav Dahal, UK
Kalyanmoy Deb, India
Emilio Del-Moral-Hernandez, Brazil
Andries Engelbrecht, South Africa
Tomoki Fukai, Japan
Lance Fung, Australia
Takeshi Furuhashi, Japan
Hiroshi Furutani, Japan
John Q. Gan, UK
Wen Gao, China
Peter Geczy, Japan
Fanji Gu, China
Zeng-Guang Hou, Canada
Chenyi Hu, USA
Masumi Ishikawa, Japan
Robert John, UK
Mohamed Kamel, Canada
Yoshiki Kashimori, Japan
Samuel Kaski, Finland
Andy Keane, UK
Graham Kendall, UK
Jong-Hwan Kim, Korea
JungWon Kim, UK
Irwin King, Hong Kong
Natalio Krasnogor, UK
Vincent C.S. Lee, Australia
Stan Z. Li, China
XiaoLi Li, UK
Yangmin Li, Macau
Derong Liu, USA
Jian-Qin Liu, Japan
Bao-Liang Lu, China
Simon Lucas, UK
Frederic Maire, Australia
Jacek Mandziuk, Poland
Satoshi Matsuda, Japan
Masakazu Matsugu, Japan
Bob McKay, Australia
Ali A. Minai, USA
Hiromi Miyajima, Japan
Pedja Neskovic, USA
Richard Neville, UK
Tohru Nitta, Japan
Yusuke Nojima, Japan
Takashi Omori, Japan
M. Palaniswami, Australia
Andrew P. Paplinski, Australia
Asim Roy, USA
Bernhard Sendhoff, Germany
Qiang Shen, UK
Jang-Kyoo Shin, Korea
Leslie Smith, UK
Andy Song, Australia
Lambert Spannenburg, Sweden
Mingui Sun, USA
Johan Suykens, Belgium
Hideyuki Takagi, Japan
Kay Chen Tan, Singapore
Kiyoshi Tanaka, Japan
Seow Kiam Tian, Singapore
Peter Tino, UK
Kar-Ann Toh, Singapore
Yasuhiro Tsujimura, Japan
Ganesh Kumar Venayagamoorthy,
USA
Brijesh Verma, Australia
Ray Walshe, Ireland
Jun Wang, Hong Kong
Rubin Wang, China
Xizhao Wang, China
Sumio Watanabe, Japan
Stefan Wermter, UK
Kok Wai Wong, Australia

Hong Yan, Hong Kong
 Ron Yang, UK
 Daniel Yeung, Hong Kong
 Ali M.S. Zalzal, UK
 Xiaojun Zeng, UK

David Zhang, Hong Kong
 Huaguang Zhang, China
 Liming Zhang, China
 Qiangfu Zhao, Japan

Special Sessions Organizers

Ke Chen, UK
 Gary Egan, Australia
 Masami Hagiya, Japan
 Tai-hoon Kim, Korea
 Yangmin Li, Macau
 Osamu Ono, Japan
 Gwi-Tae Park, Korea
 John A. Rose, Japan
 Xingming Sun, China

Ying Tan, Hong Kong
 Peter Tino, UK
 Shiro Usui, Japan
 Rubin Wang, China
 Keming Xie, China
 Xiaolan Zhang, USA
 Liang Zhao, Brazil
 Henghui Zou, USA
 Hengming Zou, China

Reviewers

Ajith Abraham
 Wensen An
 Yisheng An
 Jiancong Bai
 Gurvinder Baicher
 Xiaojuan Ban
 Yukun Bao
 Helio Barbosa
 Zafer Bingul
 Liefeng Bo
 Yin Bo
 Gavin Brown
 Nan Bu
 Erhan Butun
 Chunhong Cao
 Huai-Hu Cao
 Qixin Cao
 Yijia Cao
 Yuan-Da Cao
 Yuhui Cao
 Yigang Cen
 Chunlei Chai

Li Chai
 Ping-Teng Chang
 Kwokwing Chau
 Ailing Chen
 Chen-Tung Chen
 Enqing Chen
 Fangjiong Chen
 Houjin Chen
 Jiah-Shing Chen
 Jing Chen
 Jingchun Chen
 Junying Chen
 Li Chen
 Shenglei Chen
 Wei Chen
 Wenbin Chen
 Xi Chen
 Xiyuan Chen
 Xuhui Chen
 Yuehui Chen
 Zhen-Cheng Chen
 Zhong Chen

Jian Cheng
 Il-Ahn Cheong
 Yiu-Ming Cheung
 Yongwha Chung
 Lingli Cui
 Jian-Hua Dai
 Chuangyin Dang
 Xiaolong Deng
 Hongkai Ding
 Zhan Ding
 Chao-Jun Dong
 Guangbo Dong
 Jie Dong
 Sheqin Dong
 Shoubin Dong
 Wenying Dong
 Feng Du
 Hai-Feng Du
 Yanping Du
 Shukai Duan
 Metin Ertunc
 Liu Fan

Gang Fang	Jianming Hu	Dongwoo Lee
Hui Fang	Li Kun Hu	Kwangeui Lee
Chen Feng	Tao Hu	Seonghoon Lee
Guiyu Feng	Ye Hu	Seunggwan Lee
Jian Feng	Bingqiang Huang	Kaiyou Lei
Peng Fu	Gaoming Huang	Xiongguo Lei
Yongfeng Fu	Min Huang	Soo Kar Leow
Yuli Fu	Yanwen Huang	Anping Li
Naohiro Fukumura	Yilun Huang	Boyu Li
Haichang Gao	Siu Cheung Hui	Cheng Li
Haihua Gao	Changha Hwang	Dahu Li
Zong Geem	Jun-Cheol Jeon	Guanghui Li
Emin Germen	Hyuncheol Jeong	Guoyou Li
Ling Gong	Guangrong Ji	Hongyan Li
Maoguo Gong	Mingxing Jia	Huanqin Li
Tao Gong	Sen Jia	Jianhua Li
Weiguo Gong	Zhuang Jian	Jie Li
Danying Gu	Chunhong Jiang	Jing Li
Qiu Guan	Dongxiang Jiang	Kangshun Li
Salyh Günet	Jijiao Jiang	Qiangwei Li
Dongwei Guo	Minghui Jiang	Qian-Mu Li
Tian-Tai Guo	Mingyan Jiang	Qingyong Li
Xinchen Guo	Quanyuan Jiang	Ruonan Li
Xiu Ping Guo	Li Cheng Jiao	Shouju Li
Yi'nan Guo	Liu Jie	Xiaobin Li
Mohamed Hamada	Wuyin Jin	Xihai Li
Jianchao Han	Xu Jin	Xinchun Li
Lixin Han	Ling Jing	Xiumei Li
Soowhan Han	Peng Jing	Xuming Li
Xiaozhuo Han	Xing-Jian Jing	Ye Li
Fei Hao	Tao Jun	Ying Li
Jingsong He	Hosang Jung	Yongjie Li
Jun He	Jo Nam Jung	Yuangui Li
Liqiang He	Venu K Murthy	Yun Li
Xiaoxian He	Jaeho Kang	Yunfeng Li
Xiping He	Kyung-Woo Kang	Yong Li
Yi He	Ali Karci	Bojian Liang
Zhaoshui He	Hyun-Sung Kim	Jiuzhen Liang
Xingchen Heng	Jongmin Kim	Xiao Liang
Chao-Fu Hong	Jongweon Kim	Yanchun Liang
Chi-I Hsu	Kee-Won Kim	Yixiong Liang
Chunhua Hu	Myung Won Kim	Guanglan Liao
Hai Hu	Wonil Kim	Yingxin Liao
Hongying Hu	Heeyong Kwon	Sehun Lim
Hua Hu	Xiang-Wei Lai	Tong Ming Lim

Jianning Lin	Hongling Meng	Philly Rhee
Ling Lin	Kehua Miao	Lili Rong
Pan Lin	Teijun Miao	Fuhua Shang
Qiu-Hua Lin	Shi Min	Ronghua Shang
Zhi-Ling Lin	Hongwei Mo	Zichang Shangguan
Zhou Ling	Dhinaharan Nagamalai	Dayong Shen
Benyong Liu	Atulya Nagar	Xisheng Shen
Bing Liu	Mi Young Nam	Daming Shi
Bingjie Liu	Rongrong Ni	Xiaolong Shi
Dang-Hui Liu	Rui Nian	Zhiping Shi
Feng Liu	Ben Niu	Noritaka Shigei
Hehui Liu	Qun Niu	Jooyong Shim
Huayong Liu	Sun-Kuk Noh	Dongkyoo Shin
Jianchang Liu	Linlin Ou	Yongyi Shou
Jing Liu	Mayumi Oyama-Higa	Yang Shu
Jun Liu	Cuneyt Oysu	Valceres Silva
Lifang Liu	A. Alper Ozalp	Daniel Smutek
Linlan Liu	Ping-Feng Pai	Haiyan Song
Meiqin Liu	Li Pan	Jiaxing Song
Miao Liu	Tinglong Pan	Jingyan Song
Qicheng Liu	Zhiming Pan	Wenbin Song
Ruochen Liu	Xiaohong Pang	Xiao-Yu Song
Tianming Liu	Francesco Pappalardo	Yan Yan Song
Weidong Liu	Hyun-Soo Park	Tieming Su
Xianghui Liu	Yongjin Park	Xiaohong Su
Xiaoqun Liu	Xiaomei Pei	P.N. Suganthan
Yong-Lin Liu	Jun Peng	Guangzhong Sun
Zheng Liu	Wen Peng	Huali Sun
Zhi Liu	Yan Peng	Shiliang Sun
Jianchang Lu	Yuqing Peng	Wei Sun
Jun Lu	Zeng Peng	Yuqiu Sun
Xiaobo Lu	Zhenrui Peng	Zhanquan Sun
Yinan Lu	Zhongbo Peng	Jin Tang
Dehan Luo	Daoying Pi	Jing Tang
Guiming Luo	Fangzhong Qi	Suqin Tang
Juan Luo	Tang Qi	Zhiqiang Tang
Qiang Lv	Rong Qian	Zhang Tao
Srinivas M.B.	Xiaoyan Qian	Hissam Tawfik
Changshe Ma	Xueming Qian	Hakan Temeltas
Weimin Ma	Baohua Qiang	Nipon Theera-Umpon
Wenping Ma	Bin Qin	Mei Tian
Xuan Ma	Zhengjun Qiu	Chung-Li Tseng
Michiharu Maeda	Wentai Qu	Ibrahim Turkoglu
Bertrand Maillet	Yunhua Rao	Juan Velasquez
Toshihiko Matsuka	Sundaram Ravi	Bin Wang

Chao-Xue Wang	Shengwu Xiong	Chen Yong
Chaoyong Wang	Zhangliang Xiong	Eun-Jun Yoon
Deji Wang	Chunlin Xu	Xinge You
Dingcheng Wang	Jianhua Xu	Changjie Yu
Gi-Nam Wang	Jinhua Xu	Fei Yu
Guojiang Wang	Junqin Xu	Fusheng Yu
Hong Wang	Li Xu	Guoyan Yu
Hongbo Wang	Lin Xu	Lean Yu
Hong-Gang Wang	Shuxiang Xu	Mian-Shui Yu
Jigang Wang	Xianyun Xu	Qingjun Yu
Lin Wang	Xin Xu	Shiwen Yu
Ling Wang	Xu Xu	Xinjie Yu
Min Wang	Xue-Song Xu	Mingwei Yuan
Qingquan Wang	Zhiwei Xu	Shenfang Yuan
Shangfei Wang	Yiliang Xu	Xun Yue
Shaowei Wang	Jianping Xuan	Wu Yun
Teng Wang	Yaofeng Xue	Yeboon Yun
Weihong Wang	Yuncan Xue	Jin Zeng
Xin Wang	Hui Yan	C.H. Zhang
Xinyu Wang	Qiao Yan	Changjiang Zhang
Yan Wang	Xiaohong Yan	Chunkai Zhang
Yanbin Wang	Bo Yang	Da-Peng Zhang
Yaonan Wang	Chunyan Yang	Defu Zhang
Yen-Nien Wang	Feng Yang	Fan Zhang
Yong-Xian Wang	Guifang Yang	Fengyue Zhang
Zhanshan Wang	Guoqing Yang	Hong Zhang
Zheng-You Wang	Guowei Yang	Hong-Bin Zhang
Zhurong Wang	Huihua Yang	Ji Zhang
Wang Wei	Jianwei Yang	Jiang Zhang
Xun-Kai Wei	Jing Yang	Li Zhang
Chunguo Wu	Li-Ying Yang	Liyan Zhang
Fei Wu	Qingyun Yang	Li-Yong Zhang
Ji Wu	Xiaohua Yang	Min Zhang
Qiongshui Wu	Xiaowei Yang	Ming-Jie Zhang
Qiuxuan Wu	Xuhua Yang	Rubo Zhang
Sitao Wu	Yingchun Yang	Ruo-Ying Zhang
Wei Wu	Zhihui Yang	Weidong Zhang
Yanwen Wu	Jingtao Yao	Wei-Guo Zhang
Ying Wu	Her-Terng Yau	Wen Zhang
Chen Xi	Chaoqun Ye	Xiufeng Zhang
Shi-Hong Xia	He Yi	Yangsen Zhang
Guangming Xian	Ling-Zhi Yi	Yifei Zhang
Binglei Xie	Li Yin	Yong-Dong Zhang
Li Xie	Rupo Yin	Yue-Jie Zhang
Tao Xie	Liang Ying	Yunkai Zhang

Yuntao Zhang
 Zhenya Zhang
 Hai Zhao
 Jian Zhao
 Jianxun Zhao
 Jianye Zhao
 Lianwei Zhao
 Lina Zhao
 Wencang Zhao
 Xingming Zhao
 Xuelong Zhao
 Yinliang Zhao
 Zhidong Zhao

Tiejun Zhao
 Liu Zhen
 Guibin Zheng
 Shiqin Zheng
 Yihui Zheng
 Weicai Zhong
 Zhou Zhong
 Dongming Zhou
 Gengui Zhou
 Hongjun Zhou
 Lifang Zhou
 Wengang Zhou
 Yuren Zhou

Zhiheng Zhou
 Zongtan Zhou
 Chengzhi Zhu
 En Zhu
 Li Zhu
 Wen Zhu
 Yaoqin Zhu
 Xiaobin Zou
 Xiaobo Zou
 Zhenyu Zou
 Wenming Zuo

* The term after a name may represent either a country or a region.

Table of Contents – Part II

Neural Network Applications: Pattern Recognition and Diagnostics

Monitoring of Tool Wear Using Feature Vector Selection and Linear Regression <i>Zhong Chen, XianMing Zhang</i>	1
Image Synthesis and Face Recognition Based on 3D Face Model and Illumination Model <i>Dang-hui Liu, Lan-sun Shen, Kin-man Lam</i>	7
Head-and-Shoulder Detection in Varying Pose <i>Yi Sun, Yan Wang, Yinghao He, Yong Hua</i>	12
Principal Component Neural Networks Based Intrusion Feature Extraction and Detection Using SVM <i>Hai-Hua Gao, Hui-Hua Yang, Xing-Yu Wang</i>	21
GA-Driven LDA in KPCA Space for Facial Expression Recognition <i>Qijun Zhao, Hongtao Lu</i>	28
A New ART Neural Networks for Remote Sensing Image Classification <i>AnFei Liu, BiCheng Li, Gang Chen, Xianfei Zhang</i>	37
Modified Color Co-occurrence Matrix for Image Retrieval <i>Min Hyuk Chang, Jae Young Pyun, Muhammad Bilal Ahmad, Jong Hoon Chun, Jong An Park</i>	43
A Novel Data Fusion Scheme for Offline Chinese Signature Verification <i>Wen-ming Zuo, Ming Qi</i>	51
A Multiple Eigenspaces Constructing Method and Its Application to Face Recognition <i>Wu-Jun Li, Bin Luo, Chong-Jun Wang, Xiang-Ping Zhong, Zhao-Qian Chen</i>	55
Quality Estimation of Fingerprint Image Based on Neural Network <i>En Zhu, Jianping Yin, Chunfeng Hu, Guomin Zhang</i>	65
Face Recognition Based on PCA/KPCA Plus CCA <i>Yunhui He, Li Zhao, Cairong Zou</i>	71

Texture Segmentation Using Intensified Fuzzy Kohonen Clustering Network <i>Dong Liu, Yinggan Tang, Xinping Guan</i>	75
Application of Support Vector Machines in Reciprocating Compressor Valve Fault Diagnosis <i>Quanmin Ren, Xiaojiang Ma, Gang Miao</i>	81
The Implementation of the Emotion Recognition from Speech and Facial Expression System <i>Chang-Hyun Park, Kwang-Sub Byun, Kwee-Bo Sim</i>	85
Kernel PCA Based Network Intrusion Feature Extraction and Detection Using SVM <i>Hai-Hua Gao, Hui-Hua Yang, Xing-Yu Wang</i>	89
Leak Detection in Transport Pipelines Using Enhanced Independent Component Analysis and Support Vector Machines <i>Zhengwei Zhang, Hao Ye, Guizeng Wang, Jie Yang</i>	95
Line-Based PCA and LDA Approaches for Face Recognition <i>Vo Dinh Minh Nhat, Sungyoung Lee</i>	101
Comparative Study on Recognition of Transportation Under Real and UE Status <i>Jingxin Dong, Jianping Wu, Yuanfeng Zhou</i>	105
Adaptive Eye Location Using FuzzyART <i>Jo Nam Jung, Mi Young Nam, Phill Kyu Rhee</i>	109
Face Recognition Using Gabor Features and Support Vector Machines <i>Yunfeng Li, Zongying Ou, Guoqiang Wang</i>	119
Wavelet Method Combining BP Networks and Time Series ARMA Modeling for Data Mining Forecasting <i>Weimin Tong, Yijun Li</i>	123
On-line Training of Neural Network for Color Image Segmentation <i>Yi Fang, Chen Pan, Li Liu</i>	135
Short-Term Prediction on Parameter-Varying Systems by Multiwavelets Neural Network <i>Fen Xiao, Xieping Gao, Chunhong Cao, Jun Zhang</i>	139

VICARED: A Neural Network Based System for the Detection of Electrical Disturbances in Real Time <i>Iñigo Monedero, Carlos León, Jorge Ropero, José Manuel Elena, Juan C. Montaña</i>	147
Speech Recognition by Integrating Audio, Visual and Contextual Features Based on Neural Networks <i>Myung Won Kim, Joung Woo Ryu, Eun Ju Kim</i>	155
A Novel Pattern Classification Method for Multivariate EMG Signals Using Neural Network <i>Nan Bu, Jun Arita, Toshio Tsuji</i>	165
Data Fusion for Fault Diagnosis Using Dempster-Shafer Theory Based Multi-class SVMs <i>Zhonghui Hu, Yunze Cai, Ye Li, Yuanguai Li, Xiaoming Xu</i>	175
Modelling of Rolling and Aging Processes in Copper Alloy by Levenberg-Marquardt BP Algorithm <i>Juanhua Su, Hejun Li, Qiming Dong, Ping Liu</i>	185
Neural Network Applications: Robotics and Intelligent Control	
An Adaptive Control for AC Servo System Using Recurrent Fuzzy Neural Network <i>Wei Sun, Yaonan Wang</i>	190
PSO-Based Model Predictive Control for Nonlinear Processes <i>Xihuai Wang, Jianmei Xiao</i>	196
Low Cost Implementation of Artificial Neural Network Based Space Vector Modulation <i>Tarik Erfidan, Erhan Butun</i>	204
A Novel Multispectral Imaging Analysis Method for White Blood Cell Detection <i>Hongbo Zhang, Libo Zeng, Hengyu Ke, Hong Zheng, Qiongshui Wu</i>	210
Intelligent Optimal Control in Rare-Earth Countercurrent Extraction Process via Soft-Sensor <i>Hui Yang, Chunyan Yang, Chonghui Song, Tianyou Chai</i>	214

Three Dimensional Gesture Recognition Using Modified Matching Algorithm <i>Hwan-Seok Yang, Jong-Min Kim, Seoung-Kyu Park</i>	224
Direct Adaptive Control for a Class of Uncertain Nonlinear Systems Using Neural Networks <i>Tingliang Hu, Jihong Zhu, Chunhua Hu, Zengqi Sun</i>	234
Neural Network Based Feedback Scheduler for Networked Control System with Flexible Workload <i>Feng Xia, Shanbin Li, Youxian Sun</i>	242
Humanoid Walking Gait Optimization Using GA-Based Neural Network <i>Zhe Tang, Changjiu Zhou, Zengqi Sun</i>	252
Adaptive Neural Network Internal Model Control for Tilt Rotor Aircraft Platform <i>Changjie Yu, Jihong Zhu, Zengqi Sun</i>	262
Novel Leaning Feed-Forward Controller for Accurate Robot Trajectory Tracking <i>D. Bi, G.L. Wang, J. Zhang, Q. Xue</i>	266
Adaptive Neural Network Control for Multi-fingered Robot Hand Manipulation in the Constrained Environment <i>Gang Chen, Shuqing Wang, Jianming Zhang</i>	270
Control of a Giant Swing Robot Using a Neural Oscillator <i>Kiyotoshi Matsuoka, Norifumi Ohyama, Atsushi Watanabe, Masataka Ooshima</i>	274
Neural Network Indirect Adaptive Sliding Mode Tracking Control for a Class of Nonlinear Interconnected Systems <i>Yanxin Zhang, Xiaofan Wang</i>	283
Sequential Support Vector Machine Control of Nonlinear Systems via Lyapunov Function Derivative Estimation <i>Zonghai Sun, Youxian Sun, Yongqiang Wang</i>	292
An Adaptive Control Using Multiple Neural Networks for the Position Control in Hydraulic Servo System <i>Yuan Kang, Ming-Hui Chua, Yuan-Liang Liu, Chuan-Wei Chang, Shu-Yen Chien</i>	296