

Communications
in Computer and Information Science

15

De-Shuang Huang Donald C. Wunsch II
Daniel S. Levine Kang-Hyun Jo (Eds.)

Advanced Intelligent Computing Theories and Applications

With Aspects of Contemporary
Intelligent Computing Techniques

4th International Conference
on Intelligent Computing, ICIC 2008
Shanghai, China, September 15-18, 2008
Proceedings

Volume Editors

De-Shuang Huang
Institute of Intelligent Machines
Intelligent Computing Laboratory
Chinese Academy of Sciences
Hefei, Anhui 230031, China
E-mail: dshuang@iim.ac.cn

Donald C. Wunsch II
Missouri University of Science & Technology
Department of Electrical and Computer Engineering
Applied Computational Intelligence Laboratory
Rolla, MO 65409-0040, USA
E-mail: wunsch@ieee.org

Daniel S. Levine
University of Texas at Arlington
Department of Psychology
Arlington, TX 76019-0528, USA
E-mail: levine@uta.edu

Kang-Hyun Jo
University of Ulsan
Graduate School of Electrical Engineering
Ulsan 680-749, South Korea
E-mail: jkh2008@islab.ulsan.ac.kr

Library of Congress Control Number: 2008933737

CR Subject Classification (1998): G.1.6, H.2.8, H.3.3, I.2.11, I.5.1

ISSN 1865-0929
ISBN-10 3-540-85929-2 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-85929-1 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
springer.com

© Springer-Verlag Berlin Heidelberg 2008
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12512744 06/3180 5 4 3 2 1 0

Preface

The International Conference on Intelligent Computing (ICIC) was formed to provide an annual forum dedicated to the emerging and challenging topics in artificial intelligence, machine learning, bioinformatics, and computational biology, etc. It aims to bring together researchers and practitioners from both academia and industry to share ideas, problems and solutions related to the multifaceted aspects of intelligent computing.

ICIC 2008, held in Shanghai, China, September 15–18, 2008, constituted the 4th International Conference on Intelligent Computing. It built upon the success of ICIC 2007, ICIC 2006 and ICIC 2005 held in Qingdao, Kunming and Hefei, China, 2007, 2006 and 2005, respectively.

This year, the conference concentrated mainly on the theories and methodologies as well as the emerging applications of intelligent computing. Its aim was to unify the picture of contemporary intelligent computing techniques as an integral concept that highlights the trends in advanced computational intelligence and bridges theoretical research with applications. Therefore, the theme for this conference was “Emerging Intelligent Computing Technology and Applications”. Papers focusing on this theme were solicited, addressing theories, methodologies, and applications in science and technology.

ICIC 2008 received 2336 submissions from 31 countries and regions. All papers went through a rigorous peer review procedure and each paper received at least three review reports. Based on the review reports, the Program Committee finally selected 401 high-quality papers for presentation at ICIC 2008, of which 373 papers have been included in three volumes of proceedings published by Springer comprising one volume of *Lecture Notes in Computer Science* (LNCS), one volume of *Lecture Notes in Artificial Intelligence* (LNAI), and one volume of *Communications in Computer and Information Science* (CCIS). The other 28 papers will be included in two international journals.

This volume of the *Communications in Computer and Information Science* (CCIS) series includes 70 papers.

The organizers of ICIC 2008, the including the Center for International Scientific Exchanges of the Chinese Academy of Sciences, Shanghai University, and the Institute of Intelligent Machines of the Chinese Academy of Sciences, made an enormous effort to ensure the success of ICIC 2008. We hereby would like to thank the members of the ICIC 2008 Advisory Committee for their guidance and advice, and the members of the Program Committee and the referees for their collective effort in reviewing and soliciting the papers. We would like to thank Alfred Hofmann, Executive Editor at Springer, for his frank and helpful advice and guidance throughout and for his support in publishing the proceedings. In particular, we would like to thank all the authors for contributing their papers. Without the high-quality submissions from the authors, the success of the conference would not have

been possible. Finally, we are especially grateful to the IEEE Computational Intelligence Society, the International Neural Network Society and the National Science Foundation of China for their sponsorship.

July 2008

De-Shuang Huang
Donald Wunsch
Daniel S. Levine
Kang-Hyun Jo

Organization

General Chair	Donald Wunsch, USA
Steering Committee Chair	De-Shuang Huang, China
Program Committee Chair	Daniel S. Levine, USA
Organizing Committee Co-chairs	Min-Rui Fei, China
	Shi-Wei Ma, China
	Chun-Hou Zheng, China
	Ji-Xiang Du, China
Award Committee Chair	Laurent Heutte, France
Publication Chair	Kang-Hyun Jo, Korea
Special Session Chair	Marco Loog, Denmark
Tutorial Co-chairs	Fakhri Karray, Canada
	Prashan Premaratne, Australia
International Liaison Chair	Frank Neumann, Germany
Publicity Co-chairs	Vitoantonio Bevilacqua, Italy
	Wanquan Liu, Australia
	Sanggil Kang, Korea
	Plamen Angelov, UK
	Xin Li, China
Exhibition Chair	Si-Liang Chen, China

Steering Committee Members

Luonan Chen, Japan	Laurent Heutte, France	Kang Li, UK
Marco Loog, Denmark	Guangrong Ji, China	Kang-Hyun Jo, Korea
Jun Zhang, China	Xiao-Ping Zhang, Canada	

Organizing Committee Members

Jian Fan, China	Zhi-Hua Li, China	Li-Xiong Li, China
Qun Niu, China	Yang Song, China	Xin Sun, China
Ling Wang, China	Yu-Lin Xu, China	Bang-Hua Yang, China

Program Committee Members

Khalid Mahmood Aamir, Pakistan	Uwe Aickelin, UK	Vasily Aristarkhov, Russian Federation
Andrea Francesco Abate, Italy	Adel M. Alimi, Tunisia	Costin Badica, Romania
Shafayat Abrar, UK	Peter Andras, UK	Vitoantonio Bevilacqua, Italy
	Plamen Angelov, UK	
	Sabri Arik, Turkey	

- Salim Bouzerdoum, Australia
 Martin Brown, UK
 Jinde Cao, China
 Uday K., USA
 Pei-Chann Chang, Taiwan
 Peng Chen, China
 Shyi-Ming Chen, Taiwan
 Shih-Hsin Chen, Taiwan
 Weidong Chen, China
 Wen-Sheng Chen, China
 Xiyuan Chen, China
 Yuehui Chen, China
 Min-Sen Chiu, Singapore
 Michal Choras, Poland
 Tommy Chow, Hong Kong
 Jose Alfredo F. Costa, Brazil
 Kevin Curran, UK
 Mingcong Deng, Japan
 Gabriella Dellino, Italy
 Salvatore Distefano, Italy
 Ji-Xiang Du, China
 Meng Joo Er, Singapore
 Karim Faez, Iran
 Jianbo Fan, China
 Minrui fei, Canada
 Wai-Keung Fung, Canada
 Max H. Garzon, USA
 Liang Gao, China
 Ping Guo, China
 Qing-Wei Gao, China
 Xiao-Zhi Gao, Finland
 Chandan Giri, India
 Kayhan Gulez, Turkey
 Fei Han, China
 Kyungsook Han, Korea
 Aili Han, China
 Jim Harkin, UK
 Haibo He, USA
 Francisco Herrera, Spain
 Laurent Heutte, France
 Wei-Chiang Hong, Taiwan
 Yuexian Hou, China
- Guang-Bin Huang, Singapore
 Peter Chi Fai Hung, Ireland
 Won Joo Hwang, Korea
 Estevam Rafael Hruschka J., Brazil
 Myong K. Jeong, USA
 Guangrong Ji, China
 Zhenran Jiang, China
 Kang-Hyun Jo, Korea
 Jih-Gau Juang, Taiwan
 Dah-Jing Jwo, Taiwan
 Janusz Kacprzyk, Poland
 Visakan Fakhri Karray, Canada
 Hirotaka Inoue Kure, Japan
 Jia Li, China
 Kadirkamanathan, UK
 Hee-Jun Kang, Korea
 Sanggil Kang, Korea
 Uzay Kaymak, Netherlands
 Ziad Kobti, Canada
 Mario Koeppen, Japan
 Muhammad Khurram Khan, Pakistan
 Donald H. Kraft, USA
 Harshit Kumar, Korea
 Takashi Kuremoto, Japan
 Hak-Keung Lam, UK
 Sungshin Kim, Korea
 In-Soo Koo, Korea
 Yoshinori Kuno, Japan
 Turgay Ibrikci, Turkey
 Richard Lathrop, USA
 Choong Ho Lee, Korea
 Vincent C.S. Lee, Australia
 Dalong Li, USA
 Guo-Zheng Li, China
 Peihua Li, China
 Xiaoli Li, China
 Xin Li, China
 Xueling Li, China
- Hualou Liang, USA
 Chunmei Liu, USA
 Ju Liu, China
 Van-Tsai Liu, Taiwan
 Wanquan Liu, Australia
 Yanzhang Liu, China
 Ahmad Lotfi, UK
 Hongtao Lu, China
 Jinwen Ma, China
 Shiwei Ma, China
 Hiroshi Mamitsuka, Japan
 Filippo Menolascina, Italy
 Tarik Veli Mumcu, Turkey
 Roman Neruda, Czech Republic
 Frank Neumann, Germany
 Minh Nhut Nguyen, Singapore
 Ngoc Thanh Nguyen, Poland
 Sim-Heng Ong, Singapore
 Francesco Pappalardo, Italy
 Sung-Joon Park, Korea
 Daniel Patino, Argentina
 Girijesh Prasad, UK
 Prashan Premaratne, Australia
 Nini Rao, China
 Miguel Alberto Melgarejo Rey, Colombia
 Peter Rockett, UK
 Fariba Salehi, Iran
 Angel Sappa, Spain
 Karadeniz, Turkey
 Aamir Shahzad, Pakistan
 Li Shang, China
 Nobutaka Shimada, Japan
 Jiatao Song, China
 Anantaporn Srisawat, Thailand
 Nuanwan
 Soonthornphisaj, Thailand
 Joao Miguel da Costa Sousa, Portugal

Min Su, USA
 Zhan-Li Sun, Singapore
 Maolin Tang, Australia
 Antonios Tsourdos, UK
 Naoyuki Tsuruta, Japan
 Athanasios Vasilakos,
 Greece
 Anhua Wan, China
 Chao-Xue Wang, China
 Jeen-Shing Wang, Taiwan
 Jiang-Qing Wang, China
 Yong Wang, Japan
 Zhi Wang, China

Hong Wei, UK
 Zhi Wei, China
 Ling-Yun Wu, China
 Shunren Xia, China
 Yu Xue, China
 Ching-Nung Yang,
 Taiwan
 Jun-Heng Yeh, Taiwan
 Myeong-Jae Yi, Korea
 Xinge You, China
 Tina Yu, Canada
 Zhi-Gang Zeng, China
 Guisheng Zhai, Japan

Jun Zhang, China
 Xi-Wen Zhang, China
 Hongyong Zhao, China
 Xiaoguang Zhao, China
 Zhongming Zhao, USA
 Bo-Jin Zheng, China
 Fengfeng Zhou, USA
 Byoung-Tak Zhang, Korea
 Xing-Ming Zhao, Japan
 Chun-Hou Zheng, China
 Daqi Zhu, China
 Xiaojin Zhu, China

Reviewers

Rahat Abbas, Janos Abonyi, Giuseppe M.C. Acciani, Ali Ahmed Adam, Alimi Adel, Muhammad Zubair Afzal, H. Agaenina, Hassan Aghaenina, Ali Aghagolzadeh, Chang Wook Ahn, Lifeng Ai, Ayca Gokhan Ak, Waseem Akhtar, Mustafa Aktas, Songul Albayrak, Davide Alemani, Rahim Ali, Ibrahim Aliskan, Muhammad Alkarouri, Abdullah Al-Malaise, Rui Jorge Almeida, Khareem Almo, Dario Aloise, Pablo Javier Alsina, Roberto T. Alves, Saleh Aly, Marco Alzate, Hamidreza Amindavar, Plamen Angelov, Dennis Barrios Aranibar, Nestor Arana Arexolaleiba, Salvatore Arinisi, Vasily Aristarkhov, Ali Ashraf-Modarres, Krassimir Atanassov, Mutlu Avci, Phillipa Avery, Erel Avineri, Thouraya Ayedi, Pedro Paulo Ayrosa, Amelia Badica, Hyeon Bae, Aditya Bagchi, Chenggang Bai, Meng Bai, Amar Balla, Lucia Ballerini, Rajib Bandyopadhyay, Sudhir Kumar Barai, Peter Baranyi, Nicola Barbarini, Jose Joel Gonzalez Barbosa, Andres Eduardo Gaona Barrera, Guilherme Barreto, Lucia Barron, Ying L. Becker, Nur Bekiroglu, Ammar Belatreche, Domenico Bellomo, Umesh Bellur, Tomas Beran, Saul Bertuccio, Alvaro Betancourt, Vitoantonio Bevilacqua, Fiachra Mac Giolla Bhríde, M.R. Bhujade, Rongfang Bie, Gennaro Nicola Bifulco, Laurentiu Biscu, P.K. Biswas, Santosh Biswas, Antonino Biundo, Dario de Blasiis, S.M. Bohte, Danail Bonchev, Andreia G. Bonfante, Olaf Booij, Giuseppe Borzi, Janez Brank, Agostinho de Medeiros Brito Junior, Dimo Brockhoff, Dario Bruneo, Ni Bu, Mari Angelica Camargo-Brunetto, Louis-Claude Canon, Galip Cansever, Anne Magali de Paula Canuto, Jianting Cao, Jinde Cao, Yang Cao, Yuan Cao, Lucia Cariello, Leonarda Carnimeo, Bianca di Angeli Carreras Simoes Costa, Bruno Motta de Carvalho, Matthew Casey, Ssa Giovanna Castellano, Marcello Castellano, Filippo Castiglione, Oscar Castillo, Pablo de Castro Roberto Catanuto, Zhiwei Cen, Jes de Jesus Fiais Cerqueira, Mark Chadwick, P. P. Chakrabarty, Mandira Chakraborty, Sandipan Chakpoborty, Chien-lung Chan, Chuan-Yu Chang, Yeong-Chan Chang, Dong Eui Chang, Kuei-Hsiang Chao, Kuei-Hsiang Chao, Liheng Chao, Hassan Tariq Chattha, Santanu Chattopadhyay, Rizwan Chaudhry, Saurabh Chaudhury, Dongsheng Che, Jiuhua Chen, Chun-Hao Chen, Cycer Chen, Chuyao Chen, Dan Chen, Shi-Jay Chen, Dongsheng Chen, Ziyi Chen, Feng-Chi Chen, Tin-Chih Chen, Yen-Ping Chen, Xuedong Chen, Zhi-Jie Chen, GS Chen, Li-Wen Chen, Miller Chen, Xinkai Chen,

Xinyu Chen, Peter Chen, Sheng Chen, Zehua Chen, Gang Chen, Ming Chen, Peng Chen, Yong Chen, Hui Chen, Ken Chen, Lin Chen, Qisong Chen, Yiming Chen, Qiming Cheng, Ming-Yang Cheng, Mu-Huo Cheng, Victor Cherepanov, Ching-Tsan Cheung, Chi Chiu Chiang, Jen-Chieh Chiang, Jerry Chien, C. H. Chin, Chaotang Chiu, Chih-Hui Chiu, Min-Sen Chiu, Leszek Chmielewski, Dong-Yeon Cho, Chang-Sik Choi, Sungsoo Choi, Sungsoo Choi, Won Ho Choi, Michal Choras, Smitashree Choudhary, Yun-Kung Chung, Andrzej Cichocki, Vincent Cicirello, Alessandro Cincotti, Guilherme Coelho, Leandro Coelho, Dorian Cojocar, Joan Condell, Oscar Cordon, Luciano da Fontoura Costa, Jose Alfredo, F. Costa, Mirel Cosulschi, Deborah Cravalho, Valentin Cristea, Cuco Cristiano, Jie Cui, Feipeng Da, Keshav Dahal, Zhifeng Dai, Hong-Yi Dai, Domenico Daleno, Nabanita Das, Bijan Davvaz, Kaushik Deb, Jayanta Kumar Debnath, Alberto Del, Bimbo Haibo Deng, Glad Deschrijver, Michael Dewar, Sajal Dey, Habib Dhahri, Jianli Ding, Alessia D'Introno, Banu Diri, Salvatore Distefano, Adriana Dobriceanu, Wenyong Dong, Yan Dong, Guy Drouin, Yongping Du, Xin Du, Mojie Duan, Fuqing Duan, Yunsuo Duan, Li Duan, Wieslaw A. Dudek, Martyn Durrant, Nees Jan van Eck, John Economou Shinto Eguchi, Chen Ei, Mehmet Kubilay Eker, Atilla Elçi, Meisam Emamjome, Seref N. Engin, Tolga Ensari, Zeki Erdem, Koksal Erenturk, Kadir Erkan, Osman Erol, Andrés Escobar, Imen Essafi, Charles Eugene, Eugene C. Ezin, Mehdi Ezoji, Umar Faiz, Alexandre Xavier Falcão, Ivanoe De Falco, Chun-I Fan, Chin yuan Fan, Shaojing Fan, Jian Fan, Xiang Fan, Kai Fan, Ping-An Fang, Yong Fang, Yi Fang, Adel Omran Farag, Sheyla Farias, Maria Fazio, Joseana Macedo Fachine, Jun Fei, Balazs Feil, Naizhang Feng, Jan Feyereisl, Sevan Ficici, Juan Carlos Figueroa, Simone Fiori, Robert Fisher, Kenneth Ford, Girolamo Fornarelli, Carlos Henrique Forster, Flavius Frasinca, Chaojin Fu, Shengli Fu, Hong Fu, Yu Fu, John Fulcher, Wai-keung Fung, Colin Fyfe, Sebastian Galvao, Zhaohui Gan, zunhai Gao, Jianxin Gao, Xiao-Zhi Gao, Qingwei Gao, Shouwei Gao, Tiehong Gao, Haibin Gao, Xin Gao, Andres Gaona, Juan Carlos Figueroa García, Alexandru Gartner, Vicente Zarzoso Gascon-Pelegri, António Gaspar-Cunha, Dingfei Ge, Fei Ge, Pando Georgiev, David Geronim, Adam Ghandar, Arfan Ghani, Pradip Ghanty, Hassan Ghasemian, Supratip Ghose, R. K. Ghosh, Marco Giannini Gustavo, Gimenez Mark Girolami, Adrian Giurca, Brendan Glackin, Cornelius Glackin, Amin Yazdanpanah Goharizi, Jackson Gomes, Márcio Leandro Gonçalves, Feng Gong, Xing Gong, Xiujun Gong, Adilson Gonzaga, Flavius Gorgonio, Diganata Goswami, Victor Hugo Grisales, André Grüning, Feng Gu, Ricardo Ribeiro Gudwin, Andrea Guerriero, Jie Gui Kayhan Gülez, Kayhan Gulez, Ge Guo, Feng-Biao Guo, Lanshen Guo, Tiantai Guo, Weiping Guo, Zheng Guo, A K Gupta, A. Gupta, Indranil Gupta, Dan Gusfield, Giménez-Lugo Gustavo, Taeho Ha, Javad Haddadnia, Tarek M. Hamdani, Yousaf Hamza, A. Han, Kyungsook Han, Kuk-Hyun Han, Lianyi Han, Kijun Han, Santoso Handri, yuanling Hao, Edda Happ, Jim Harkin, Pitoyo Hartono, Nada Hashmi, Mark Hatcher, Jean-Bernard Hayet, Guoliang He, Zhaoshui He, Zhongkun He, Zhiyong He, Hanlin He, Jun He, Liu He, Yu He, Martin Hermanto, Emilio Del Moral Hernandez, Carlos Herrera, Christian W. Hesse, Hidehiro Ohki Hidehiro, John Ho, Murillo Rodrigo Petrucelli Homem, Murillo Homem, Wei-Chiang Hong, Dihui Hong, Xia Hong, Gen Hori, Keiichi Horio, Shijinn Horng, Christian Horoba, Alamgir Hossain, Yuexian Hou, Zhixiang Hou, Guolian Hou, Estevam R. Hruschka Jr., Chen-Huei Hsieh, Jih-Chang Hsieh, Jui-chien Hsieh, Sun-Yuan Hsieh, Chi-I Hsu, Yu-Liang Hsu, Dan Hu, Yongqiang Hu, Xiaolin

Hu, Ting Hu, YAN Hua, Chuanxiu Huang, Jian Huang, Wei-Hsiu Huang, Sun-Jen Huang, Weichun Huang, Weitong Huang, Ying J. Huang, Yuefei Huang, Jian Huang, Ping Huang, Di Huang, Evan J Hughes, Yung-Yao Hung, Changyue Huo, Knut Huper, Saiful Huq, Kao-Shing Hwang, I-Shyan Hwang, Won-Joo Hwang, Mintae Hwang, Hwang, Wonju Hwang, Muhammad Usman Ilyas, Anca Ion, Ahmad Ali Iqbal, Zahid Irfan, Y. Ishida, Ivan Nunes Silva, Kuncup Iswandy, Marcin Iwanowski, Yumi Iwashita, Sridhar Iyer, Gonçalves, J. F., Beirão, N., Saurabh Jain, Lakhmi Jain, Sanjay Kumar Jana, D. Janakiram, Jun-Su Jang, Marko Jankovic, Mun-Ho Jeong, Zhi-Liang Ji, Hongjun Jia, Wei Jia, Jigui Jian, Cizhong Jiang, Chang-An Jiang, Yuncheng Jiang, Minghui Jiang, Xingyan Jiang, Lihua iang, Bin Jiao, Kyohong Jin, Zhong Jin, Rong Jin, Geunsik Jo, Jang Wu Jo, Torres-Sospedra Joaquin, Daniel Johannsen, Colin Johnson, José Demisio Simões da Silva, R.K. Joshi, Tejal Joshi, Koo Joungsun, Jih-Gau Juang, Carme Julià, Young Bae Jun, Heesung Jun, Khurum Nazir Junejo, Jinguk Jung, Francisco Madeiro Bernardino Junior, Roberto Marcondes Cesar Junior, Dah-Jing Jwo, Osvaldo Mafra Lopes Junio, E. Kabir, Visakan Kadirkamanathan, Salim Kahveci, kaka, Ilhem Kallel, Habib Kammoun, Hamid Reza Rashidy Kanan, Hyunduk Kang, Hyun-Deok Kang, Hee-June Kang, Hyunduk Kang, Henry Kang, Yasuki Kansha, Cihan Karakuzu, Ghader Karimian, Bekir Karlik, Shohreh Kasaei, Faisal M Kashif, Boer-Sorbán Katalin, H Kawasaki, Olesya Kazakova, Christel Kemke, Tamas Kenesei, Selami Kesler, Muhammad Khurram Khan, Malik Jahan Khan, Shehroz Khan, Pabitra Mohan Khilar, Pabitra Khilar, Chin Su Kim, Chungsan Kim, Dae-Nyeon Kim, Myung-Kyun Kim, Kane Kim, Pil Gyeom Kim, Seong Joo Kim, Eunchan Kim, Gwan-Su Kim, Hak Lae Kim, Kanghee Kim, Il Kon Kim, Sung S Kim, Taeho Kim, Christian Klein, Chun-Hsu Ko, Yoshinori Kobayashi, Kunikazu Kobayashi, Andreas Koenig, Mario Koeppen, Andrew Koh, xiangzhen Kong, Insoo Koo, Murakami Kouji, Vladik Kreinovich, Ibrahim Kucukdemiral, Rajeev Kumar, Chao-Lin Kuo, Tzu-Wen Kuo, Wen-Chung Kuo, Simon Kuo, Takashi Kuremoto, Zarei-Nia Kurosh, Janset Kuvulmaz, Yung-Keun Kwon, Chien-Yuan Lai, Franklin Lam, H.K. Lam, Andrey Larionov, Pietro Larizza, M. Mircea Lazar, Vincenzo Di Lecce, Yulia Ledeneva, Bore-Kuen Lee, Chiho Lee, Kyung Chang Lee, Vincent C S Lee, Myung-Joon Lee, Guanling Lee, Hong-Hee Lee, Ka-keung Lee, Shao-Lun Lee, Eun-Mi Lee, In-Hee Lee, Sangho Lee, Minhoo Lee, N.-Y. Lee, Peter Lee, Lee, Lee, Suwon Lee, Vincent Lee, Per Kristian Lehre, Yujun Leng, Agustin Leon, Carson K. Leung, Alexandre Levada, Ao Li, Caiwei Li, Chen Li, Chia-Hsiang Li, Chien-Kuo Li, Bo Li, Mingdong Li, Hualiang Li, Weigang Li, KeQing Li, Xinyu Li, Heng-Chao Li, Guozheng Li, Hongchun Li, Kangshun Li, Qingfeng Li, Xiaodong Li, zhisheng Li, HuiFang Li, Renwang Li, Shanbin Li, Xueling Li, Yueping Li, Liyuan Li, Rewang Li, Shutao Li, Yiyang Li, Fuhai Li, Li Erguo, Jian Li, Yong Li, Lei Li, Min Li, Feng-Li Lian, Yun-Chia Liang, Hualou Liang, Han Liang, Liao, Wudai Liao, Hee-Woong Lim, Cheng-Jian Lin, Chih-Min Lin, Feng-Yan Lin, Jyun Jie Lin, Jyun-Yu Lin, Jun-Lin Lin, Yu-Chen Lin, Jimmy Lin, Lin, Hao Lin, Junjie Lin, Yingbiao Ling, Steve Ling, Chang Liu, Che-Wei Liu, Bingqiang Liu, Yubao Liu, Xingcheng Liu, Yongmei liu, Jing Liu, Mei-qin Liu, Qingshan Liu, Van-Tsai Liu, KunHong Liu, liangxu liu, Shiping Liu, Weiling Liu, Xiaomin Liu, Xiaoyue Liu, Yu-ling Liu, Zhiping Liu, Hongbo Liu, Jizhen Liu, Liu, Yifan Liu, Qian Liu, Xiao Liu, Jin Liu, Jun Liu, Yue Liu, Joe K. W. Lo, Asim Loan, Andrey Logvinov, Francesco Longo, Milan Lovric, Baoliang Lu, Yixiang Lu, Junguo

Lu, Feng Lu, June Lu, Wei Lu, CJ Luh, Luiz Marcos Garcia Gonçalves, Andrew Lumsdaine, Tom Lunney, Jingchu Luo, Yan Luo, Leh Luoh, Yan Lv, Chuang Ma, Yinglong Ma, Liyong Ma, Irwin Ma, Jin Ma, Sakashi Maeda, Sakashi Maeda, Sudipta Mahapatra, Sydulu Maheswarapu, Andre Laurindo Maitelli, A.K. Majumdar, Chandan Majumdar, Terrence Mak, Hiroshi Mamitsuka, Qing-Kui Man, Achintya Kumar Mandal, Danilo Mandic, Mata-Montero ManriqueAtif Mansoor, Chengxiong Mao, Zhiming Mao, Fenglou Mao, Zhihong Mao, Weihua Mao, Kezhi Mao, Joao Fernando Marar, Márcio Leandro Gonçalves Mario Marinelli, Francescomaria Marino Urszula Markowska-Kaczmar, Alan Marshall, Allan de Medeiros Martins, Nelson Delfino d Avila Mascarenhas, Emilio Mastriani, Giuseppe Mastronardi, Francesco Masulli, Mohammad Ali Maud, Giancarlo Mauri, Joseph McClay, Liam McDaid, Malachy McElholm, Adelardo A. Dantas de Medeiros, Claudio Medeiros, Reginald Mehta, Jorge Dantas de Melo, Luis Mendonca, Weixiao Meng, Filippo Menolascina, Jianxun Mi, Hirvensalo Mika, Nikolay Mikhaylov, Claudia Milaré, Viorel Milea, Milos Radovanovic, Mihoko Minami, Tsunenori Mine, Giuseppe Minutoli, Sushmita Mitra, Mandar Mitra, Yasue Mitsukura, Jinqiu Mo, Asunción Mochón, Hamid Abrishami, Moghaddam Hamid, Abrishami Moghaddam, Nurul Haque Mollah, Marina Mongiello, Inhyuk Moon, Fearghal Morgan, Yasamin Mostofi, Santo Motta, saeed Mozaffari, Mikhail Mozerov, Krishnendu Mukhopadhyay, J. Mukhopadhyay, Hamid Mukhtar, Tarik Veli Mumcu, T. Murakami, C. Siva Ram Murthy, Muhammad Aziz Muslim, Kazuo Nakamura, Sukumar Nandi, David Naso, Pedro L.K.G Navarro, Duarte Dória Neto, Frank Neumann, WK Ng, Hoi Shing Raymond NG, Tian-Tsong Ng, Vinh Hao Nguyen, Tam Nguyen, Ni, Oana Nicolae, Li Nie, Ke Ning, Luis F. Nino, Fauzia Nisar, Maria Nisar, Takuichi Nishimura, Qun Niu, Shimada Nobutaka, Lars Nolle, Clement Nyirenda, Masanao Obayashi, Hasan Ocak, Richard Oentaryo, Jaewon Oh, Halil Ibrahim Okumus, M. Sorin Olaru, Luiz Affonso H Guedes de Oliveira, Pietro Oliveto, Onat, Kok-Leong Ong, Johan Oppen, Denis Orel, Ajiboye Osunleke, Gaoxiang Ouyang, Ali Ozen, Opraog Pag, Umapada Pal, luca Paladina, Sarbani Palit, Shanliang Pan, Tianhong Pan, Wan-Ling Pan, Paolo Pannarale, Maurizio Paone, Angelo Paradiso, Emerson Paraiso, Daniel Paraschiv, Sang Kyeong Park, Jintae Park, Swapan Kumar Parui, Halit Pastaci, Giuseppe Patanè, Athanasios Pavlou, Jeronimo Pellegrini, Jeronimo Pellegrini, Wei Peng, Marzio Pennisi, Graziano Pesole, Emil Petre, Alfredo Petrosino, Minh-Tri Pham, Vinhthuy Phan, Francesco Piazzaa, Aderson Pifer, Pinar, Huseyin Polat, Alexander Ponomarenko, Alisa Ponomarenko, Elvira Popescu, Girijesh Prasad, Prashan Premaratne, Adam Prugel_bennett, Andrzej Przybyszewski, Viswanath Pulabaigari, Alfredo Pulvirenti, Liu Qian, Haiyan Qiao, Lishan Qiao, Yu Qiao, Hong Qin, Jun Qin, Ying-qiang Qiu, ying qiu, Dong-Cai Qu, Tho Quan, Paulo Quintiliano, Ijaz Mansoor Qureshi, Tariq Rasheed Qureshi, Anas Quteishat, S.V. Raghavan, Carmelo Ragusa, Mkm Rahman, Anca Ralescu, Ramon Zatarain-Cabada, Milton Ramos, Zeeshan Rana, Raquel Esperanza Patiño Escarcina, Jiangtao Ren, Jian Ren, Alberto Rey, Orion Fausto Reyes-Galaviz, Robert Reynolds, Gianbattista Rocco, Peter Rockett, Liu Rong, A.K. Roy, Kaushik Roy, Uttam Roy, Changhai Ru, XiaoGang Ruan, Tomasz Rutkowski, Khalid Saeed, Doris Sáez, Alaa Sagheer, G. Saha, Ratnesh Sahay, Halil Ibrahim Sahin, Mohamed Sahmoudi, G Sajith, Pijush Samui, Saeid Sanei, David Sankoff, Edimilson B. dos Santos, Jose Santos, Brahmananda Sapkota, Angel Sappa, P.Saratchandran, Yoshiko Sato, Gerald

Schaefer, Giuseppe Scionti, Dan Selisteanu, S. Selvakumar, Kirusnapillai Selvarajah, Amitava Sen, Sibel Senan, Dorin Sendrescu, Indranil Sengupta, D.Y. Sha, A Shah, Syed Faisal Ali Shah, Syed Ismail Shah, Suleman Shahid, Bilal Shams, Shahnoor Shanta, Li Shao, Qadeer Sharif, Shahzad Amin Sheikh, Hao Shen, Xianjun Shen, Yantao Shen, Yehu Shen, Jinn-Jong Sheu, Chuan Shi, MingGuang Shi, Yongren Shi, Ke Shi, Horng-Lin Shieh, Motoki Shiga, Atsushi Shimada, Tetsuya Shimamura, Soo-Yong Shin, Wochang Shin, Tae zi Shin, Takahashi Shinozaki, Dipak Lal Shrestha, Bi Shuhui, Leandro Augusto da Silva, Fulvio Simonelli, Leszek Sliwko, Kate A.Smith, Grant Smith, Heliana B. Soares, Zhuoyue Song, Qiankun Song, Yinglei Song, Ong Yew Soon, Nuanwan Soonthornphisaj, Jairo Soriano, Joao M. C. Sousa, Marcilio Carlos P. de Souto, Jackson Gomes de Souza, Birol Soysal, Stefano Squartini, Mscislaw Srutek, Cristina Stoica, Umberto Straccia, Antony Streklas, Zheng Su, Min Su, Ahlada Sudersan, Akira Sukanuma, Youngsoo Suh, Ziwen Sun, Tsung-Ying Sun, Tien-Lung Sun, Xiangyang Sun, Jingchun Sun, Shiwei Sun, Lily Sun, Yude Sun, Nak Woon Sung, Seokjin Sung, Worasait Suwannik, Aqeel Syed, Duong Ta, Abdullah Taha, Chen Tai, Oluwafemi Taiwo, Shin-ya Takahashi, B. Talukdar, Hakaru Tamukoh, Guangzheng Tan, Ping Tan, Toshihisa Tanaka, Chunming Tang, Hong Tang, David Taniar, Zou Tao, Liang Tao, Imran Tasadduq, Peter Tawdross, Mohammad Teshnehlab, Niwat Thepvilojanapong, Daniel Thiele, Quan Thanh Tho, Jingwen Tian, Jiang Tian, Yun Tian, Ye Tian, Huaglory Tianfield, Ching-Jung Ting, Massimo Tistarelli, Stefania Tommasi, Ximo Torres, Farzad Towhidkhal, Cong Tran-Xuan, Roque Mendes Prado Trindade, Hoang-Hon Trinh, Gianluca Triolo, Giuseppe Troccoli, Chieh-Yuan Tsai, Chi-Yang Tsai, Chueh-Yung Tsao, Norimichi Tsumura, Naoyuki Tsuruta, Hang Tu, Hung-Yi Tu, Luong Trung Tuan, Petr Tuma, Cigdem Turhan, Francesco Tusa, Bulent Tutmez, Seiichi Uchida, Muhammad Muneeb Ullah, Nurettin Umurkan, Mustafa Unel, Ray Urzulak, Ernesto Cuadros Vargas, Andrey Vavilin, Simona Venuti, Silvano Vergura, Susana Vieira, Geoffrey Vilcot, Massimo Villari, Boris Vintimilla, Holger Voos, Juan Wachs, John Wade, Hiroshi Wakuya, Julie Wall, Li Wan, Bohyeon Wang, Chao Wang, Chengyou Wang, Xingce Wang, Jia-hai Wang, Jiasong Wang, Guoli Wang, Yadong Wang, Xiaomin Wang, Jeen-Shing Wang, Zhongsheng Wang, Guoren Wang, Xiangyang Wang, Zhongxian Wang, Jianying Wang, LingLing Wang, Ruisheng Wang, Xiaodong Wang, XiaoFeng Wang, Xiaojuan Wang, Xiaoling Wang, Xuan Wang, Zhengyou Wang, Haijing Wang, Hesheng Wang, Hongxia Wang, Hongyan Wang, Jianmin Wang, Junfeng Wang, Linshan Wang, Shuting Wang, Yanning Wang, Zhisong Wang, Huimin Wang, Huisen Wang, Mingyi Wang, Shulin Wang, Zheyou Wang, Haili Wang, Jiang Wang, Kejun Wang, Linze Wang, Weiwu Wang, Jina Wang, Jing Wang, Ling Wang, Meng Wang, Qifu Wang, Yong Wang, Yan Wang, Yoshikazu Washizawa, Shih-Yung Wei, Shengjun Wen, Shenjun Wen, Guozhu Wen, Seok Woo, Derek Woods, Chao Wu, Christine Wu, Zikai Wu, Hsiao-Chun Wu, Quanjun Wu, YongWei Wu, Ing-Chyuan Wu, Shiow-yang Wu, Shiqian Wu, Shaochuan Wu, Wen-Chuan Wu, JianWu Wu, Weimin Wu, Qiong Wu, Sitao Wu, Peng Wu, Min Wu, Jun-Feng Xia, Li Xia, Yongkang Xiao, Jing Xiao, Lijuan Xiao, Renbin Xiao, Gongnan Xie, Zhijun Xie, Caihua Xiong, Wei Xiong, ChunGui Xu, Chunsui Xu, Weidong Xu, Wenlong Xu, Xiaoyin Xu, Zeshui Xu, Huan Xu, Wei Xu, Yun Xu, Xuanli Wu, Quan Xue, Yu Xue, Xuesong Yan, Li Yan, Banghua Yang, Junghua Yang, Wuchuan Yang, Yingyun Yang, Hyunho Yang, Junan Yang, Shixi

Yang, Sihai Yang, Song Yang, Yan Yang, Ming-Jong Yao, Xingzhong Yao, Daoxin Yao, Obilor Yau, Xiaoping Ye, Liang Ye, Chia-Hsuan Yeh, Ming-Feng Yeh, Jun-Heng Yeh, James Yeh, Yang Yi, Tulay Yildirim, Jian Yin, Zhouping Yin, Qian Yin, Yang Yong, Murilo Lacerda Yoshida, Norihiko Yoshida, Kaori Yoshida, Kenji Yoshimura, Mingyu You, Yu Sun Young, Changrui Yu, Gwo-Ruey Yu, Xinguo Yu, Ming Yu, Tina Yu, Zhiyong Yuan, Guili Yuan, Fang Yuan, Jing Yuan, Jing Yuan, Eylem Yucel, Lu Yue, Masahiro Yukawa, Mi-ran Yun, C. Yung, Anders Zachrison, Aamer Zaheer, Kun Zan, Yossi Zana, Rafal Zdunek, Zhigang Zeng, Wenyi Zeng, Chuan-Min Zhai, Byoung-Tak Zhang, Chuan Zhang, Dabin Zhang, Guangwei Zhang, Ping Zhang, Xianxia Zhang, Yongmin Zhang, Xiangliang Zhang, Zhiguo Zhang, Jingliang Zhang, De-xiang Zhang, Xiaowei Zhang, Xiaoxuan Zhang, Yongping Zhang, Jianhua Zhang, Junpeng Zhang, Shanwen Zhang, Si-Ying Zhang, Weigang Zhang, Yonghui Zhang, Zanchao Zhang, Zhiyong Zhang, Guohui Zhang, Guowei Zhang, Jiakai Zhang, Li-bao Zhang, Liqing Zhang, Yunong Zhang, Zhijia Zhang, LiBao Zhang, Wenbo Zhang, Jian Zhang, Ming Zhang, Peng Zhang, Ping Zhang, Zhen Zhang, Fei Zhang, Jie Zhang, Jun Zhang, Li Zhang, Bo Zhao, Xiaoguang Zhao, Quanming Zhao, Xiaodong Zhao, Yinggang Zhao, Zengshun Zhao, Yanfei Zhao, Ting Zhao, Yaou Zhao, Qin Zhao, Xin Zhao, Yi Zhao, Bojin Zheng, Xin Zheng, Yi Zheng, Aimin Zhou, Chi Zhou, Chunlai Zhou, Xiaocong Zhou, Fengfeng Zhou, Qinghua Zhou, Jiayin Zhou, Zekui Zhou, Qiang Zhou, Wei Zhou, Dao Zhou, Hao Zhou, Jin Zhou, Wen Zhou, Zhongjie Zhu, Quanmin Zhu, Wei Zhu, Hankz Zhuo, Majid Ziaratban.

Table of Contents

Evolutionary Computing and Genetic Algorithms

Adaptive Routing Algorithm in Wireless Communication Networks Using Evolutionary Algorithm	1
<i>Xuesong Yan, Qinghua Wu, and Zhihua Cai</i>	
A New GA – Based and Graph Theory Supported Distribution System Planning	7
<i>Sajad Najafi Ravadanegh</i>	
Sequencing Mixed-Model Assembly Lines with Limited Intermediate Buffers by a GA/SA-Based Algorithm	15
<i>Binggang Wang, Yunqing Rao, Xinyu Shao, and Mengchang Wang</i>	
Solving Vehicle Routing Problem Using Ant Colony and Genetic Algorithm	23
<i>Wen Peng and Chang-Yu Zhou</i>	

Knowledge Discovery and Data Mining

A Research on the Association of Pavement Surface Damages Using Data Mining	31
<i>Ching-Tsung Hung, Jia-Ray Chang, Jian-Da Chen, Chien-Cheng Chou, and Shih-Huang Chen</i>	
An Integrated Method for GML Application Schema Match	39
<i>Chao Li, Xiao Zeng, and Zhang Xiong</i>	
Application of Classification Methods for Forecasting Mid-Term Power Load Patterns	47
<i>Minghao Piao, Heon Gyu Lee, Jin Hyoung Park, and Keun Ho Ryu</i>	
Design of Fuzzy Entropy for Non Convex Membership Function	55
<i>Sanghyuk Lee, Sangjin Kim, and Nam-Young Jang</i>	
Higher-Accuracy for Identifying Frequent Items over Real-Time Packet Streams	61
<i>Ling Wang, Yang Koo Lee, and Keun Ho Ryu</i>	
Privacy Preserving Sequential Pattern Mining in Data Stream	69
<i>Qin-Hua Huang</i>	

Methods of Computing Optimization

A General k -Level Uncapacitated Facility Location Problem	76
<i>Rongheng Li and Hwei-Chuen Huang</i>	
Fourier Series Chaotic Neural Networks	84
<i>Yao-qun Xu and Shao-ping He</i>	
Numerical Simulation and Experimental Study of Liquid-Solid Two-Phase Flow in Nozzle of DIA Jet	92
<i>Guihua Hu, Wenhua Zhu, Tao Yu, and Jin Yuan</i>	
Shape Matching Based on Ant Colony Optimization	101
<i>Xiangbin Zhu</i>	

Fuzzy Systems and Soft Computing

A Simulation Study on Fuzzy Markov Chains	109
<i>Juan C. Figueroa García, Dusko Kalenatic, and Cesar Amilcar Lopez Bello</i>	
A Tentative Approach to Minimal Reducts by Combining Several Algorithms	118
<i>Ning Xu, Yunxiang Liu, and Ruqi Zhou</i>	
Ameliorating GM (1, 1) Model Based on the Structure of the Area under Trapezium	125
<i>Cuifeng Li</i>	
Comparative Study with Fuzzy Entropy and Similarity Measure: One-to-One Correspondence	132
<i>Sanghyuk Lee, Sangjin Kim, and DongYoup Lee</i>	
Low Circle Fatigue Life Model Based on ANFIS	139
<i>Changhong Liu, Xintian Liu, Hu Huang, and Lihui Zhao</i>	
New Structures of Intuitionistic Fuzzy Groups	145
<i>Chuanyu Xu</i>	

Intelligent Computing in Pattern Recognition

An Illumination Independent Face Verification Based on Gabor Wavelet and Supported Vector Machine	153
<i>Xingming Zhang, Dian Liu, and Jianfu Chen</i>	
Hardware Deblocking Filter and Impact	161
<i>Hao Lian and Mohammed Ghanbari</i>	

Medical Image Segmentation Using Anisotropic Filter, User Interaction and Fuzzy C-Mean (FCM)	169
<i>M.A. Balafar, Abd. Rahman Ramli, M. Iqbal Saripan, Rozi Mahmud, and Syamsiah Mashohor</i>	
Medical Image Segmentation Using Fuzzy C-Mean (FCM), Learning Vector Quantization (LVQ) and User Interaction	177
<i>M.A. Balafar, Abd. Rahman Ramli, M. Iqbal Saripan, Rozi Mahmud, and Syamsiah Mashohor</i>	
New Data Pre-processing on Assessing of Obstructive Sleep Apnea Syndrome: Line Based Normalization Method (LBNM)	185
<i>Bayram Akdemir, Salih Güneş, and Şebnem Yosunkaya</i>	
Recognition of Plant Leaves Using Support Vector Machine	192
<i>Qing-Kui Man, Chun-Hou Zheng, Xiao-Feng Wang, and Feng-Yan Lin</i>	
Region Segmentation of Outdoor Scene Using Multiple Features and Context Information	200
<i>Dae-Nyeon Kim, Hoang-Hon Trinh, and Kang-Hyun Jo</i>	
Two-Dimensional Partial Least Squares and Its Application in Image Recognition	208
<i>Mao-Long Yang, Quan-Sen Sun, and De-Shen Xia</i>	

Intelligent Computing in Bio/Cheminformatics

A Novel Method of Creating Models for Finite Element Analysis Based on CT Scanning Images	216
<i>Liulan Lin, Jiafeng Zhang, Shaohua Ju, Aili Tong, and Minglun Fang</i>	
Accelerating Computation of DNA Sequence Alignment in Distributed Environment	222
<i>Tao Guo, Guiyang Li, and Russel Deaton</i>	
Predicting Protein Function by Genomic Data-Mining	229
<i>Changxin Song and Ke Ma</i>	
Tumor Classification Using Non-negative Matrix Factorization	236
<i>Ping Zhang, Chun-Hou Zheng, Bo Li, and Chang-Gang Wen</i>	

Intelligent Control and Automation

A Visual Humanoid Teleoperation Control for Approaching Target Object	244
<i>Muhammad Usman Keerio, Altaf Hussain Rajpar, Attaullah Khawaja, and Yuepin Lu</i>	

An Intelligent Monitor System for Gearbox Test 252
Guangbin Zhang, Yunjian Ge, Kai Fang, and Qiaokang Liang

Development of Simulation Software for Coal-Fired Power Units Based
on Matlab/Simulink 260
Chang-liang Liu, Lin Chen, and Xiao-mei Wang

Inconsistency Management 268
Sylvia Encheva and Sharil Tumin

Neural Network-Based Adaptive Optimal Controller – A
Continuous-Time Formulation 276
Draguna Vrabie, Frank Lewis, and Daniel Levine

On Improved Performance Index Function with Enhanced
Generalization Ability and Simulation Research 286
Dongcai Qu, Rijie Yang, and Yulin Mi

Intelligent Fault Diagnosis

A Fault Diagnosis Approach for Rolling Bearings Based on EMD
Method and Eigenvector Algorithm 294
Jinyu Zhang and Xianxiang Huang

An Adaptive Fault-Tolerance Agent Running on Situation-Aware
Environment 302
SoonGohn Kim and EungNam Ko

Dynamic Neural Network-Based Pulsed Plasma Thruster (PPT) Fault
Detection and Isolation for Formation Flying of Satellites 310
A. Valdes and K. Khorasani

Model-Based Neural Network and Wavelet Packets Decomposition on
Damage Detecting of Composites 322
Zhi Wei, Huisen Wang, and Ying Qiu

Intelligent Computing in Communication

A High Speed Mobile Courier Data Access System That Processes
Database Queries in Real-Time 329
Barnabas Ndlovu Gatsheni and Zwelakhe Mabizela

A Scalable QoS-Aware VoD Resource Sharing Scheme for Next
Generation Networks 337
*Chenn-Jung Huang, Yun-Cheng Luo, Chun-Hua Chen, and
Kai-Wen Hu*

Brain Mechanisms for Making, Breaking, and Changing Rules 345
Daniel S. Levine

Implementation of a Landscape Lighting System to Display Images	356
<i>Gi-Ju Sun, Sung-Jae Cho, Chang-Beom Kim, and Cheol-Hong Moon</i>	

Intelligent Sensor Networks

Probability-Based Coverage Algorithm for 3D Wireless Sensor Networks	364
<i>Feng Chen, Peng Jiang, and Anke Xue</i>	
Simulating an Adaptive Fault Tolerance for Situation-Aware Ubiquitous Computing	372
<i>EungNam Ko and SoonGohn Kim</i>	
A Hybrid CARV Architecture for Pervasive Computing Environments	380
<i>SoonGohn Kim and Eung Nam Ko</i>	

Intelligent Image/Document Retrievals

Image and Its Semantic Role in Search Problem	388
<i>Nasir Touheed, Muhammad Saeed, M. Atif Qureshi, and Arjumand Younus</i>	
Color Image Watermarking Scheme Based on Efficient Preprocessing and Support Vector Machines	398
<i>Oğuz Fındık, Mehmet Bayrak, İsmail Babaoğlu, and Emre Çomak</i>	
Multiple Ranker Method in Document Retrieval	407
<i>Dong Li, Maoqiang Xie, Yang Wang, Yalou Huang, and Weijian Ni</i>	

Special Session on Image Processing, Analysis, and Vision Technology Based Intelligent Robot Systems

An Elimination Method of Light Spot Based on Iris Image Fusion	415
<i>Yuqing He, Hongying Yang, Yushi Hou, and Huan He</i>	
An Improved Model of Producing Saliency Map for Visual Attention System	423
<i>Jingang Huang, Bin Kong, Erkang Cheng, and Fei Zheng</i>	
Multiple Classification of Plant Leaves Based on Gabor Transform and LBP Operator	432
<i>Feng-Yan Lin, Chun-Hou Zheng, Xiao-Feng Wang, and Qing-Kui Man</i>	
Research on License Plate Detection Based on Wavelet	440
<i>Junshan Pan and Zhiyong Yuan</i>	

Stereo Correspondence Using Moment Invariants 447
Prashan Premaratne and Farzad Safaei

The Application of the Snake Model in Carcinoma Cell Image
Segment 455
Zhen Zhang, Peng Zhang, Xiaobo Mao, and Shanzhong Zhang

**Special Session on Data Mining and Fusion in
Bioinformatics**

Data Clustering and Evolving Fuzzy Decision Tree for Data Base
Classification Problems 463
Pei-Chann Chang, Chin-Yuan Fan, and Yen-Wen Wang

Multivariate Polynomials Estimation Based on GradientBoost in
Multimodal Biometrics 471
Mehdi Parviz and M. Shahram Moin

**Special Session on Advances in Multidimensional
Signal Processing**

An Introduction to Volterra Series and Its Application on Mechanical
Systems 478
*C. Bharathy, Pratima Sachdeva, Harish Parthasarthy, and
Akash Tayal*

Skin Detection from Different Color Spaces for Model-Based Face
Detection 487
Dong Wang, Jinchang Ren, Jianmin Jiang, and Stan S. Ipson

Other Topics

Applying Frequent Episode Algorithm to Masquerade Detection 495
Feng Yu and Min Wang

An Agent-Based Intelligent CAD Platform for Collaborative Design 501
Quan Liu, Xingran Cui, and Xiuyin Hu

Design of a Reliable QoS Requirement Based on RCSM by Using
MASQ Architecture 509
Eung Nam Ko and SoonGohn Kim

Minimization of the Disagreements in Clustering Aggregation 517
Safia Nait Bahloul, Baroudi Rouba, and Youssef Amghar

Prediction of Network Traffic Using Multiscale-Bilinear Recurrent
Neural Network with Adaptive Learning 525
Dong-Chul Park

Replay Attacks on Han et al.'s Chaotic Map Based Key Agreement Protocol Using Nonce	533
<i>Eun-Jun Yoon and Kee-Young Yoo</i>	
The Short-Time Multifractal Formalism: Definition and Implement	541
<i>Xiong Gang, Yang Xiaoniu, and Zhao Huichang</i>	
Modified Filled Function Method for Resolving Nonlinear Integer Programming Problem	549
<i>Yong Liu and You-lin Shang</i>	
Author Index	557