

# Lecture Notes in Artificial Intelligence 3613

Edited by J. G. Carbonell and J. Siekmann

Subseries of Lecture Notes in Computer Science

Lipo Wang Yaochu Jin (Eds.)

# Fuzzy Systems and Knowledge Discovery

Second International Conference, FSKD 2005  
Changsha, China, August 27-29, 2005  
Proceedings, Part I



Springer

## Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA  
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

## 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

Yaochu Jin  
Honda Research Institute Europe  
Carl-Legien-Str. 30, 63073 Offenbach/Main, Germany  
E-mail: yaochu.jin@honda-ri.de

Library of Congress Control Number: 2005930642

CR Subject Classification (1998): I.2, F.4.1, F.1, F.2, G.2, I.2.3, I.4, I.5

ISSN	0302-9743
ISBN-10	3-540-28312-9 Springer Berlin Heidelberg New York
ISBN-13	978-3-540-28312-6 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](http://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: 11539506 06/3142 5 4 3 2 1 0

# Preface

This book and its sister volume, LNAI 3613 and 3614, constitute the proceedings of the Second International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2005), jointly held with the First International Conference on Natural Computation (ICNC 2005, LNCS 3610, 3611, and 3612) from August 27–29, 2005 in Changsha, Hunan, China. FSKD 2005 successfully attracted 1249 submissions from 32 countries/regions (the joint ICNC-FSKD 2005 received 3136 submissions). After rigorous reviews, 333 high-quality papers, i.e., 206 long papers and 127 short papers, were included in the FSKD 2005 proceedings, representing an acceptance rate of 26.7%.

The ICNC-FSKD 2005 conference 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 computation with words, fuzzy computation, granular computation, neural computation, quantum computation, evolutionary computation, DNA computation, chemical computation, information processing in cells and tissues, molecular computation, artificial life, swarm intelligence, ants colony, 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 over the past 18 months. We wish to express our heart-felt 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 FSKD 2005 proceedings as two volumes of the Lecture Notes in Artificial Intelligence series (and the ICNC 2005 proceedings as three volumes of the Lecture Notes in Computer Science series). Finally, we thank all the authors

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

August 2005

Lipo Wang  
Yaochu Jin

# Organization

FSKD 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:	Shun-ichi Amari, <i>Japan</i> Lotfi A. Zadeh, <i>USA</i>
General Chair:	He-An Luo, <i>China</i>
General Co-chairs:	Lipo Wang, <i>Singapore</i> Yunqing Huang, <i>China</i>
Program Chair:	Yaochu Jin, <i>Germany</i>
Local Arrangement Chairs:	Renren Liu, <i>China</i> Xieping Gao, <i>China</i>
Proceedings Chair:	Fen Xiao, <i>China</i>
Publicity Chair:	Hepu Deng, <i>Australia</i>
Sponsorship/Exhibits Chairs:	Shaoping Ling, <i>China</i> Geok See Ng, <i>Singapore</i>
Webmasters:	Linai Kuang, <i>China</i> Yanyu Liu, <i>China</i>

## Advisory Board

Toshio Fukuda, <i>Japan</i>	Witold Pedrycz, <i>Canada</i>
Kunihiko Fukushima, <i>Japan</i>	Jose C. Principe, <i>USA</i>
Tom Gedeon, <i>Australia</i>	Harold Szu, <i>USA</i>
Aike Guo, <i>China</i>	Shiro Usui, <i>Japan</i>
Zhenya He, <i>China</i>	Xindong Wu, <i>USA</i>
Janusz Kacprzyk, <i>Poland</i>	Lei Xu, <i>Hong Kong</i>
Nikola Kasabov, <i>New Zealand</i>	Xin Yao, <i>UK</i>
John A. Keane, <i>UK</i>	Syozo Yasui, <i>Japan</i>
Soo-Young Lee, <i>Korea</i>	Bo Zhang, <i>China</i>
Erkki Oja, <i>Finland</i>	Yixin Zhong, <i>China</i>
Nikhil R. Pal, <i>India</i>	Jacek M. Zurada, <i>USA</i>

## Program Committee Members

Janos Abonyi, <i>Hungary</i>	Michael Margaliot, <i>Israel</i>
Jorge Casillas, <i>Spain</i>	Ralf Mikut, <i>Germany</i>
Pen-Chann Chang, <i>Taiwan</i>	Pabitra Mitra, <i>India</i>
Chaochang Chiu, <i>Taiwan</i>	Tadahiko Murata, <i>Japan</i>
Feng Chu, <i>Singapore</i>	Detlef Nauck, <i>UK</i>
Oscar Cordon, <i>Spain</i>	Hajime Nobuhara, <i>Japan</i>
Honghua Dai, <i>Australia</i>	Andreas Nürnberger, <i>Germany</i>
Fernando Gomide, <i>Brazil</i>	Da Ruan, <i>Belgium</i>
Saman Halgamuge, <i>Australia</i>	Thomas Runkler, <i>Germany</i>
Kaoru Hirota, <i>Japan</i>	Rudy Setiono, <i>Singapore</i>
Frank Hoffmann, <i>Germany</i>	Takao Terano, <i>Japan</i>
Jinglu Hu, <i>Japan</i>	Kai Ming Ting, <i>Australia</i>
Weili Hu, <i>China</i>	Yiyu Yao, <i>Canada</i>
Chongfu Huang, <i>China</i>	Gary Yen, <i>USA</i>
Eyke Hüllermeier, <i>Germany</i>	Xinghuo Yu, <i>Australia</i>
Hisao Ishibuchi, <i>Japan</i>	Jun Zhang, <i>China</i>
Frank Klawoon, <i>Germany</i>	Shichao Zhang, <i>Australia</i>
Naoyuki Kubota, <i>Japan</i>	Yanqing Zhang, <i>USA</i>
Sam Kwong, <i>Hong Kong</i>	Zhi-Hua Zhou, <i>China</i>
Zongmin Ma, <i>China</i>	

## Special Sessions Organizers

David Siu-Yeung Cho, <i>Singapore</i>	Zongmin Ma, <i>China</i> ,
Vlad Dimitrov, <i>Australia</i>	Geok-See Ng, <i>Singapore</i>
Jinwu Gao, <i>China</i>	Shaoqi Rao, <i>China</i>
Zheng Guo, <i>China</i>	Slobodan Ribari, <i>Croatia</i>
Bob Hodge, <i>Australia</i>	Sung Y. Shin, <i>USA</i>
Jiman Hong, <i>Korea</i>	Yasufumi Takama, <i>Japan</i>
Jae-Woo Lee, <i>Korea</i>	Robert Woog, <i>Australia</i>
Xia Li, <i>China</i>	

## Reviewers

Nitin V. Afzulpurkar	Liu Bin	An-Long Chen
Davut Akdas	Tao Bo	Dewang Chen
Kürat Ayan	Hongbin Cai	Gang Chen
Yasar Becerikli	Yunze Cai	Guangzhu Chen
Dexue Bi	Jian Cao	Jian Chen
Rong-Fang Bie	Chunguang Chang	Shengyong Chen

Shi-Jay Chen	Zhonghui Hu	Ling-Zhi Liao
Xuerong Chen	Changchun Hua	Lei Lin
Yijiang Chen	Jin Huang	Caixia Liu
Zhimei Chen	Qian Huang	Fei Liu
Zushun Chen	Yanxin Huang	Guangli Liu
Hongqi Chen	Yuansheng Huang	Haowen Liu
Qimei Chen	Kohei Inoue	Honghai Liu
Wei Cheng	Mahdi Jalili-Kharaajoo	Jian-Guo Liu
Xiang Cheng	Caiyan Jia	Lanjuan Liu
Tae-Ho Cho	Ling-Ling Jiang	Peng Liu
Xun-Xue Cui	Michael Jiang	Qihe Liu
Ho Daniel	Xiaoyue Jiang	Sheng Liu
Hepu Deng	Yanping Jiang	Xiaohua Liu
Tingquan Deng	Yunliang Jiang	Xiaojuan Liu
Yong Deng	Cheng Jin	Yang Liu
Zhi-Hong Deng	HanJun Jin	Qiang Luo
Mingli Ding	Hong Jin	Yanbin Luo
Wei-Long Ding	Ningde Jin	Zhi-Jun Lv
Fangyan Dong	Xue-Bo Jin	Jian Ma
Jingxin Dong	Min-Soo Kim	Jixin Ma
Lihua Dong	Sungshin Kim	Longhua Ma
Yihong Dong	Taehan Kim	Ming Ma
Haifeng Du	Ibrahim Beklan	Yingcang Ma
Weifeng Du	Kucukdemiral	Dong Miao
Liu Fang	Rakesh Kumar Arya	Zhinong Miao
Zhilin Feng	Ho Jae Lee	Fan Min
Li Gang	Sang-Hyuk Lee	Zhang Min
Chuanhou Gao	Sang-Won Lee	Zhao Min
Yu Gao	Wol Young Lee	Daniel Neagu
Zhi Geng	Xiuren Lei	Yiu-Kai Ng
O. Nezih Gerek	Bicheng Li	Wu-Ming Pan
Rongjie Gu	Chunyan Li	Jong Sou Park
Chonghui Guo	Dequan Li	Yonghong Peng
Gongde Guo	Dingfang Li	Punpiti Piamsa-Nga
Huawei Guo	Gang Li	Heng-Nian Qi
Mengshu Guo	Hongyu Li	Gao Qiang
Zhongming Han	Qing Li	Wu Qing
Bo He	Ruqiang Li	Celia Ghedini Ralha
Pilian He	Tian-Rui Li	Wang Rong
Liu Hong	Weigang Li	Hongyuan Shen
Kongfa Hu	Yu Li	Zhenghao Shi
Qiao Hu	Zhichao Li	Jeong-Hoon Shin
Shiqiang Hu	Zhonghua Li	Sung Chul Shin
Zhikun Hu	Hongxing Li	Chonghui Song
Zhonghui Hu	Xiaobei Liang	Chunyue Song



Guangda Su	Jianping Wu	Chun-Hai Yu
Baolin Sun	Shunxiang Wu	Haibin Yuan
Changyin Sun	Xiaojun Wu	Jixue Yuan
Ling Sun	Yuying Wu	Weiqi Yuan
Zhengxing Sun	Changcheng Xiang	Chuanhua Zeng
Chang-Jie Tang	Jun Xiao	Wenyi Zeng
Shanhu Tang	Xiaoming Xiao	Yurong Zeng
N K Tiwari	Wei Xie	Guojun Zhang
Jiang Ping Wan	Gao Xin	Jian Ying Zhang
Chong-Jun Wang	Zongyi Xing	Junping Zhang
Danli Wang	Hua Xu	Ling Zhang
Fang Wang	Lijun Xu	Zhi-Zheng Zhang
Fei Wang	Pengfei Xu	Yongjin Zhang
Houfeng Wang	Weijun Xu	Yongkui Zhang
Hui Wang	Xiao Xu	Jun Zhao
Laisheng Wang	Xinli Xu	Quanming Zhao
Lin Wang	Yaoqun Xu	Xin Zhao
Ling Wang	De Xu	Yong Zhao
Shitong Wang	Maode Yan	Zhicheng Zhao
Shu-Bin Wang	Shaoze Yan	Dongjian Zheng
Xun Wang	Hai Dong Yang	Wenming Zheng
Yong Wang	Jihui Yang	Zhonglong Zheng
Zhe Wang	Wei-Min Yang	Weimin Zhong
Zhenlei Wang	Yong Yang	Hang Zhou
Zhongjie Wang	Zuyuan Yang	Hui-Cheng Zhou
Runsheng Wang	Li Yao	Qiang Zhou
Li Wei	Shengbao Yao	Yuanfeng Zhou
Weidong Wen	Bin Ye	Yue Zhou
Xiangjun Wen	Guo Yi	Daniel Zhu
Taegkeun Whangbo	Jianwei Yin	Hongwei Zhu
Huaiyu Wu	Xiang-Gang Yin	Xinglong Zhu
Jiangning Wu	Yilong Yin	
Jiangqin Wu	Deng Yong	

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

# Table of Contents – Part I

## Fuzzy Theory and Models

On Fuzzy Inclusion in the Interval-Valued Sense <i>Jin Han Park, Jong Seo Park, Young Chel Kwun</i> .....	1
Fuzzy Evaluation Based Multi-objective Reactive Power Optimization in Distribution Networks <i>Jiachuan Shi, Yutian Liu</i> .....	11
Note on Interval-Valued Fuzzy Set <i>Wenyi Zeng, Yu Shi</i> .....	20
Knowledge Structuring and Evaluation Based on Grey Theory <i>Chen Huang, Yushun Fan</i> .....	26
A Propositional Calculus Formal Deductive System $\mathcal{L}^U$ of Universal Logic and Its Completeness <i>Minxia Luo, Huacan He</i> .....	31
Entropy and Subsethood for General Interval-Valued Intuitionistic Fuzzy Sets <i>Xiao-dong Liu, Su-hua Zheng, Feng-lan Xiong</i> .....	42
The Comparative Study of Logical Operator Set and Its Corresponding General Fuzzy Rough Approximation Operator Set <i>Suhua Zheng, Xiaodong Liu, Fenglan Xiong</i> .....	53
Associative Classification Based on Correlation Analysis <i>Jian Chen, Jian Yin, Jin Huang, Ming Feng</i> .....	59
Design of Interpretable and Accurate Fuzzy Models from Data <i>Zong-yi Xing, Yong Zhang, Li-min Jia, Wei-li Hu</i> .....	69
Generating Extended Fuzzy Basis Function Networks Using Hybrid Algorithm <i>Bin Ye, Chengzhi Zhu, Chuangxin Guo, Yijia Cao</i> .....	79
Analysis of Temporal Uncertainty of Trains Converging Based on Fuzzy Time Petri Nets <i>Yangdong Ye, Juan Wang, Limin Jia</i> .....	89

Interval Regression Analysis Using Support Vector Machine and Quantile Regression <i>Changha Hwang, Dug Hun Hong, Eunyoung Na, Hyejung Park, Jooyong Shim</i> .....	100
An Approach Based on Similarity Measure to Multiple Attribute Decision Making with Trapezoid Fuzzy Linguistic Variables <i>Zeshui Xu</i> .....	110
Research on Index System and Fuzzy Comprehensive Evaluation Method for Passenger Satisfaction <i>Yuanfeng Zhou, Jianping Wu, Yuanhua Jia</i> .....	118
Research on Predicting Hydatidiform Mole Canceration Tendency by a Fuzzy Integral Model <i>Yecai Guo, Yi Guo, Wei Rao, Wei Ma</i> .....	122
Consensus Measures and Adjusting Inconsistency of Linguistic Preference Relations in Group Decision Making <i>Zhi-Ping Fan, Xia Chen</i> .....	130
Fuzzy Variation Coefficients Programming of Fuzzy Systems and Its Application <i>Xiaobei Liang, Daoli Zhu, Bingyong Tang</i> .....	140
Weighted Possibilistic Variance of Fuzzy Number and Its Application in Portfolio Theory <i>Xun Wang, Weijun Xu, Weiguo Zhang, Maolin Hu</i> .....	148
Another Discussion About Optimal Solution to Fuzzy Constraints Linear Programming <i>Yun-feng Tan, Bing-yuan Cao</i> .....	156
Fuzzy Ultra Filters and Fuzzy G-Filters of MTL-Algebras <i>Xiao-hong Zhang, Yong-quan Wang, Yong-lin Liu</i> .....	160
A Study on Relationship Between Fuzzy Rough Approximation Operators and Fuzzy Topological Spaces <i>Wei-Zhi Wu</i> .....	167
A Case Retrieval Model Based on Factor-Structure Connection and $\lambda$ -Similarity in Fuzzy Case-Based Reasoning <i>Dan Meng, Zaiqiang Zhang, Yang Xu</i> .....	175

A TSK Fuzzy Inference Algorithm for Online Identification <i>Kyoungjung Kim, Eun Ju Whang, Chang-Woo Park, Euntai Kim, Mignon Park</i> .....	179
---	-----

Histogram-Based Generation Method of Membership Function for Extracting Features of Brain Tissues on MRI Images <i>Weibei Dou, Yuan Ren, Yanping Chen, Su Ruan, Daniel Bloyet, Jean-Marc Constans</i> .....	189
---	-----

## Uncertainty Management in Data Mining

On Identity-Discrepancy-Contrary Connection Degree in SPA and Its Applications <i>Yunliang Jiang, Yueting Zhuang, Yong Liu, Kegin Zhao</i> .....	195
--	-----

A Mathematic Model for Automatic Summarization <i>Zhiqi Wang, Yongcheng Wang, Kai Gao</i> .....	199
--	-----

Reliable Data Selection with Fuzzy Entropy <i>Sang-Hyuk Lee, Youn-Tae Kim, Seong-Pyo Cheon, Sungshin Kim</i> ....	203
--	-----

## Uncertainty Management and Probabilistic Methods in Data Mining

Optimization of Concept Discovery in Approximate Information System Based on FCA <i>Hanjun Jin, Changhua Wei, Xiaorong Wang, Jia Fu</i> .....	213
---	-----

Geometrical Probability Covering Algorithm <i>Junping Zhang, Stan Z. Li, Jue Wang</i> .....	223
--	-----

## Approximate Reasoning

Extended Fuzzy ALCN and Its Tableau Algorithm <i>Jianjiang Lu, Baowen Xu, Yanhui Li, Dazhou Kang, Peng Wang</i> ....	232
---	-----

Type II Topological Logic $\mathbb{C}_T^2$ and Approximate Reasoning <i>Yalin Zheng, Changshui Zhang, Yinglong Xia</i> .....	243
---	-----

Type-I Topological Logic $\mathbb{C}_{\mathcal{T}}^1$ and Approximate Reasoning <i>Yalin Zheng, Changshui Zhang, Xin Yao</i> .....	253
---	-----

Vagueness and Extensionality <i>Shunsuke Yatabe, Hiroyuki Inaoka</i> .....	263
---	-----

Using Fuzzy Analogical Reasoning to Refine the Query Answers for Relational Databases with Imprecise Information <i>Z.M. Ma, Li Yan, Gui Li</i> .....	267
A Linguistic Truth-Valued Uncertainty Reasoning Model Based on Lattice-Valued Logic <i>Shuwei Chen, Yang Xu, Jun Ma</i> .....	276
<b>Axiomatic Foundation</b>	
Fuzzy Programming Model for Lot Sizing Production Planning Problem <i>Weizhen Yan, Jianhua Zhao, Zhe Cao</i> .....	285
Fuzzy Dominance Based on Credibility Distributions <i>Jin Peng, Henry M.K. Mok, Wai-Man Tse</i> .....	295
Fuzzy Chance-Constrained Programming for Capital Budgeting Problem with Fuzzy Decisions <i>Jinwu Gao, Jianhua Zhao, Xiaoyu Ji</i> .....	304
Genetic Algorithms for Dissimilar Shortest Paths Based on Optimal Fuzzy Dissimilar Measure and Applications <i>Yinzheng Li, Ruichun He, Linzhong Liu, Yaohuang Guo</i> .....	312
Convergence Criteria and Convergence Relations for Sequences of Fuzzy Random Variables <i>Yan-Kui Liu, Jinwu Gao</i> .....	321
Hybrid Genetic-SPSA Algorithm Based on Random Fuzzy Simulation for Chance-Constrained Programming <i>Yufu Ning, Wansheng Tang, Hui Wang</i> .....	332
Random Fuzzy Age-Dependent Replacement Policy <i>Song Xu, Jiashun Zhang, Ruiqing Zhao</i> .....	336
A Theorem for Fuzzy Random Alternating Renewal Processes <i>Ruiqing Zhao, Wansheng Tang, Guofei Li</i> .....	340
Three Equilibrium Strategies for Two-Person Zero-Sum Game with Fuzzy Payoffs <i>Lin Xu, Ruiqing Zhao, Tingting Shu</i> .....	350

## Fuzzy Classifiers

An Improved Rectangular Decomposition Algorithm for Imprecise and Uncertain Knowledge Discovery <i>Jiyoung Song, Younghee Im, Daihee Park</i> .....	355
XPEV: A Storage Model for Well-Formed XML Documents <i>Jie Qin, Shu-Mei Zhao, Shu-Qiang Yang, Wen-Hua Dou</i> .....	360
Fuzzy-Rough Set Based Nearest Neighbor Clustering Classification Algorithm <i>Xiangyang Wang, Jie Yang, Xiaolong Teng, Ningsong Peng</i> .....	370
An Efficient Text Categorization Algorithm Based on Category Memberships <i>Zhi-Hong Deng, Shi-Wei Tang, Ming Zhang</i> .....	374
The Integrated Location Algorithm Based on Fuzzy Identification and Data Fusion with Signal Decomposition <i>Zhao Ping, Haoshan Shi</i> .....	383
A Web Document Classification Approach Based on Fuzzy Association Concept <i>Jingsheng Lei, Yaohong Kang, Chunyan Lu, Zhang Yan</i> .....	388
Optimized Fuzzy Classification Using Genetic Algorithm <i>Myung Won Kim, Joung Woo Ryu</i> .....	392
Dynamic Test-Sensitive Decision Trees with Multiple Cost Scales <i>Zhenxing Qin, Chengqi Zhang, Xuehui Xie, Shichao Zhang</i> .....	402
Design of T-S Fuzzy Classifier via Linear Matrix Inequality Approach <i>Moon Hwan Kim, Jin Bae Park, Young Hoon Joo, Ho Jae Lee</i> .....	406
Design of Fuzzy Rule-Based Classifier: Pruning and Learning <i>Do Wan Kim, Jin Bae Park, Young Hoon Joo</i> .....	416
Fuzzy Sets Theory Based Region Merging for Robust Image Segmentation <i>Hongwei Zhu, Otman Basir</i> .....	426
A New Interactive Segmentation Scheme Based on Fuzzy Affinity and Live-Wire <i>Huiguang He, Jie Tian, Yao Lin, Ke Lu</i> .....	436

## Fuzzy Clustering

The Fuzzy Mega-cluster: Robustifying FCM by Scaling Down Memberships

*Amit Banerjee, Rajesh N. Davé* ..... 444

Robust Kernel Fuzzy Clustering

*Weiwei Du, Kohei Inoue, Kiichi Urahama* ..... 454

Spatial Homogeneity-Based Fuzzy c-Means Algorithm for Image Segmentation

*Bo-Yeong Kang, Dae-Won Kim, Qing Li* ..... 462

A Novel Fuzzy-Connectedness-Based Incremental Clustering Algorithm for Large Databases

*Yihong Dong, Xiaoying Tai, Jieyu Zhao* ..... 470

Classification of MPEG VBR Video Data Using Gradient-Based FCM with Divergence Measure

*Dong-Chul Park* ..... 475

Fuzzy-C-Mean Determines the Principle Component Pairs to Estimate the Degree of Emotion from Facial Expressions

*M. Ashraf ul Amin, Nitin V. Afzulpurkar, Matthew N. Dailey, Vatcharaporn Esichaikul, Dentcho N. Batanov* ..... 484

An Improved Clustering Algorithm for Information Granulation

*Qinghua Hu, Daren Yu* ..... 494

A Novel Segmentation Method for MR Brain Images Based on Fuzzy Connectedness and FCM

*Xian Fan, Jie Yang, Lishui Cheng* ..... 505

Improved-FCM-Based Readout Segmentation and PRML Detection for Photochromic Optical Disks

*Jiqi Jian, Cheng Ma, Huibo Jia* ..... 514

Fuzzy Reward Modeling for Run-Time Peer Selection in Peer-to-Peer Networks

*Huaxiang Zhang, Xiyu Liu, Peide Liu* ..... 523

KFCSA: A Novel Clustering Algorithm for High-Dimension Data

*Kan Li, Yushu Liu* ..... 531

## Fuzzy Database Mining and Information Retrieval

An Improved VSM Based Information Retrieval System and Fuzzy Query Expansion <i>Jiangning Wu, Hiroki Tanioka, Shizhu Wang, Donghua Pan, Kenichi Yamamoto, Zhongtuo Wang</i> .....	537
The Extraction of Image's Salient Points for Image Retrieval <i>Wenyin Zhang, Jianguo Tang, Chao Li</i> .....	547
A Sentence-Based Copy Detection Approach for Web Documents <i>Rajiv Yerra, Yiu-Kai Ng</i> .....	557
The Research on Query Expansion for Chinese Question Answering System <i>Zhengtao Yu, Xiaozhong Fan, Lirong Song, Jianyi Guo</i> .....	571
Multinomial Approach and Multiple-Bernoulli Approach for Information Retrieval Based on Language Modeling <i>Hua Huo, Junqiang Liu, Boqin Feng</i> .....	580
Adaptive Query Refinement Based on Global and Local Analysis <i>Chaoyuan Cui, Hanxiong Chen, Kazutaka Furuse, Nobuo Ohbo</i> .....	584
Information Push-Delivery for User-Centered and Personalized Service <i>Zhiyun Xin, Jizhong Zhao, Chihong Chi, Jiaguang Sun</i> .....	594
Mining Association Rules Based on Seed Items and Weights <i>Chen Xiang, Zhang Yi, Wu Yue</i> .....	603
An Algorithm of Online Goods Information Extraction with Two-Stage Working Pattern <i>Wang Xun, Ling Yun, Yu-lian Fei</i> .....	609
A Novel Method of Image Retrieval Based on Combination of Semantic and Visual Features <i>Ming Li, Tong Wang, Bao-wei Zhang, Bi-Cheng Ye</i> .....	619
Using Fuzzy Pattern Recognition to Detect Unknown Malicious Executables Code <i>Boyun Zhang, Jianping Yin, Jingbo Hao</i> .....	629
Method of Risk Discernment in Technological Innovation Based on Path Graph and Variable Weight Fuzzy Synthetic Evaluation <i>Yuan-sheng Huang, Jian-xun Qi, Jun-hua Zhou</i> .....	635



Application of Fuzzy Similarity to Prediction of Epileptic Seizures  
Using EEG Signals  
*Xiaoli Li, Xin Yao* ..... 645

A Fuzzy Multicriteria Analysis Approach to the Optimal Use of  
Reserved Land for Agriculture  
*Hepu Deng, Guifang Yang* ..... 653

Fuzzy Comprehensive Evaluation for the Optimal Management of  
Responding to Oil Spill  
*Xin Liu, Kai W. Wirtz, Susanne Adam* ..... 662

**Information Fusion**

Fuzzy Fusion for Face Recognition  
*Xuerong Chen, Zhongliang Jing, Gang Xiao* ..... 672

A Group Decision Making Method for Integrating Outcome Preferences  
in Hypergame Situations  
*Yexin Song, Qian Wang, Zhijun Li* ..... 676

A Method Based on IA Operator for Multiple Attribute Group Decision  
Making with Uncertain Linguistic Information  
*Zeshui Xu* ..... 684

A New Prioritized Information Fusion Method for Handling Fuzzy  
Information Retrieval Problems  
*Won-Sin Hong, Shi-Jay Chen, Li-Hui Wang, Shyi-Ming Chen* ..... 694

Multi-context Fusion Based Robust Face Detection in Dynamic  
Environments  
*Mi Young Nam, Phill Kyu Rhee* ..... 698

Unscented Fuzzy Tracking Algorithm for Maneuvering Target  
*Shi-qiang Hu, Li-wei Guo, Zhong-liang Jing* ..... 708

A Pixel-Level Multisensor Image Fusion Algorithm Based on Fuzzy Logic  
*Long Zhao, Baochang Xu, Weilong Tang, Zhe Chen* ..... 717

**Neuro-Fuzzy Systems**

Approximation Bound for Fuzzy-Neural Networks with Bell  
Membership Function  
*Weimin Ma, Guoqing Chen* ..... 721

A Neuro-Fuzzy Method of Forecasting the Network Traffic of Accessing Web Server <i>Ai-Min Yang, Xing-Min Sun, Chang-Yun Li, Ping Liu</i> .....	728
A Fuzzy Neural Network System Based on Generalized Class Cover Problem <i>Yanxin Huang, Yan Wang, Wengang Zhou, Chunguang Zhou</i> .....	735
A Self-constructing Compensatory Fuzzy Wavelet Network and Its Applications <i>Haibin Yu, Qianjin Guo, Aidong Xu</i> .....	743
A New Balancing Method for Flexible Rotors Based on Neuro-fuzzy System and Information Fusion <i>Shi Liu</i> .....	757
Recognition of Identifiers from Shipping Container Images Using Fuzzy Binarization and Enhanced Fuzzy Neural Network <i>Kwang-Baek Kim</i> .....	761
Directed Knowledge Discovery Methodology for the Prediction of Ozone Concentration <i>Seong-Pyo Cheon, Sungshin Kim</i> .....	772
Application of Fuzzy Systems in the Car-Following Behaviour Analysis <i>Pengjun Zheng, Mike McDonald</i> .....	782
<b>Fuzzy Control</b>	
GA-Based Composite Sliding Mode Fuzzy Control for Double-Pendulum-Type Overhead Crane <i>Diantong Liu, Weiping Guo, Jianqiang Yi</i> .....	792
A Balanced Model Reduction for T-S Fuzzy Systems with Integral Quadratic Constraints <i>Seog-Hwan Yoo, Byung-Jae Choi</i> .....	802
An Integrated Navigation System of NGIMU/ GPS Using a Fuzzy Logic Adaptive Kalman Filter <i>Mingli Ding, Qi Wang</i> .....	812
Method of Fuzzy-PID Control on Vehicle Longitudinal Dynamics System <i>Yinong Li, Zheng Ling, Yang Liu, Yanjuan Qiao</i> .....	822

Design of Fuzzy Controller and Parameter Optimizer for Non-linear System Based on Operator's Knowledge <i>Hyeon Bae, Sungshin Kim, Yejin Kim</i> .....	833
A New Pre-processing Method for Multi-channel Echo Cancellation Based on Fuzzy Control <i>Xiaolu Li, Wang Jie, Shengli Xie</i> .....	837
Robust Adaptive Fuzzy Control for Uncertain Nonlinear Systems <i>Chen Gang, Shuqing Wang, Jianming Zhang</i> .....	841
Intelligent Fuzzy Systems for Aircraft Landing Control <i>Jih-Gau Juang, Bo-Shian Lin, Kuo-Chih Chin</i> .....	851
Scheduling Design of Controllers with Fuzzy Deadline <i>Hong Jin, Hongan Wang, Hui Wang, Danli Wang</i> .....	861
A Preference Method with Fuzzy Logic in Service Scheduling of Grid Computing <i>Yanxiang He, Haowen Liu, Weidong Wen, Hui Jin</i> .....	865
$H_{\infty}$ Robust Fuzzy Control of Ultra-High Rise / High Speed Elevators with Uncertainty <i>Hu Qing, Qingding Guo, Dongmei Yu, Xiyang Ding</i> .....	872
A Dual-Mode Fuzzy Model Predictive Control Scheme for Unknown Continuous Nonlinear System <i>Chonghui Song, Shucheng Yang, Hui yang, Huaguang Zhang, Tianyou Chai</i> .....	876
Fuzzy Modeling Strategy for Control of Nonlinear Dynamical Systems <i>Bin Ye, Chengzhi Zhu, Chuangxin Guo, Yijia Cao</i> .....	882
Intelligent Digital Control for Nonlinear Systems with Multirate Sampling <i>Do Wan Kim, Jin Bae Park, Young Hoon Joo</i> .....	886
Feedback Control of Humanoid Robot Locomotion <i>Xusheng Lei, Jianbo Su</i> .....	890
Application of Computational Intelligence (Fuzzy Logic, Neural Networks and Evolutionary Programming) to Active Networking Technology <i>Mehdi Galily, Farzad Habibipour Roudsari, Mohammadreza Sadri</i> ....	900

Fuel-Efficient Maneuvers for Constellation Initialization Using Fuzzy Logic Control	
<i>Mengfei Yang, Honghua Zhang, Rucai Che, Zengqi Sun</i> .....	910
Design of Interceptor Guidance Law Using Fuzzy Logic	
<i>Ya-dong Lu, Ming Yang, Zi-cai Wang</i> .....	922
Relaxed LMIs Observer-Based Controller Design via Improved T-S Fuzzy Model Structure	
<i>Wei Xie, Huaiyu Wu, Xin Zhao</i> .....	930
Fuzzy Virtual Coupling Design for High Performance Haptic Display	
<i>D. Bi, J. Zhang, G.L. Wang</i> .....	942
Linguistic Model for the Controlled Object	
<i>Zhinong Miao, Xiangyu Zhao, Yang Xu</i> .....	950
Fuzzy Sliding Mode Control for Uncertain Nonlinear Systems	
<i>Shao-Cheng Qu, Yong-Ji Wang</i> .....	960
Fuzzy Control of Nonlinear Pipeline Systems with Bounds on Output Peak	
<i>Fei Liu, Jun Chen</i> .....	969
Grading Fuzzy Sliding Mode Control in AC Servo System	
<i>Hu Qing, Qingding Guo, Dongmei Yu, Xiyang Ding</i> .....	977
A Robust Single Input Adaptive Sliding Mode Fuzzy Logic Controller for Automotive Active Suspension System	
<i>Ibrahim B. Kucukdemiral, Seref N. Engin, Vasfi E. Omurlu, Galip Cansever</i> .....	981
Construction of Fuzzy Models for Dynamic Systems Using Multi-population Cooperative Particle Swarm Optimizer	
<i>Ben Niu, Yunlong Zhu, Xiaoxian He</i> .....	987
Human Clustering for a Partner Robot Based on Computational Intelligence	
<i>Indra Adjı Sulistijono, Naoyuki Kubota</i> .....	1001
Fuzzy Switching Controller for Multiple Model	
<i>Baozhu Jia, Guang Ren, Zhihong Xiu</i> .....	1011
Generation of Fuzzy Rules and Learning Algorithms for Cooperative Behavior of Autonomouse Mobile Robots(AMRs)	
<i>Jang-Hyun Kim, Jin-Bae Park, Hyun-Seok Yang, Young-Pil Park</i> ....	1015

UML-Based Design and Fuzzy Control of Automated Vehicles <i>Abdelkader El Kamel, Jean-Pierre Bourey</i> .....	1025
--	------

## Fuzzy Hardware

Design of an Analog Adaptive Fuzzy Logic Controller <i>Zhihao Xu, Dongming Jin, Zhijian Li</i> .....	1034
---	------

VLSI Implementation of a Self-tuning Fuzzy Controller Based on Variable Universe of Discourse <i>Weiwei Shan, Dongming Jin, Weiwei Jin, Zhihao Xu</i> .....	1044
---	------

## Knowledge Visualization and Exploration

Method to Balance the Communication Among Multi-agents in Real Time Traffic Synchronization <i>Li Weigang, Marcos Vinícius Pinheiro Dib, Alba Cristina Magalhães de Melo</i> .....	1053
--	------

A Celerity Association Rules Method Based on Data Sort Search <i>Zhiwei Huang, Qin Liao</i> .....	1063
--	------

Using Web Services to Create the Collaborative Model for Enterprise Digital Content Portal <i>Ruey-Ming Chao, Chin-Wen Yang</i> .....	1067
---	------

Emotion-Based Textile Indexing Using Colors and Texture <i>Eun Yi Kim, Soo-jeong Kim, Hyun-jin Koo, Karpjoo Jeong, Jee-in Kim</i> .....	1077
--	------

Optimal Space Launcher Design Using a Refined Response Surface Method <i>Jae-Woo Lee, Kwon-Su Jeon, Yung-Hwan Byun, Sang-Jin Kim</i> .....	1081
--	------

MEDIC: A MDO-Enabling Distributed Computing Framework <i>Shenyi Jin, Kwangsik Kim, Karpjoo Jeong, Jaewoo Lee, Jonghwa Kim, Hoyon Hwang, Hae-Gook Suh</i> .....	1092
---	------

Time and Space Efficient Search for Small Alphabets with Suffix Arrays <i>Jeong Seop Sim</i> .....	1102
---	------

Optimal Supersonic Air-Launching Rocket Design Using Multidisciplinary System Optimization Approach <i>Jae-Woo Lee, Young Chang Choi, Yung-Hwan Byun</i> .....	1108
--	------

Numerical Visualization of Flow Instability in Microchannel Considering Surface Wettability <i>Doyoung Byun, Budiono, Ji Hye Yang, Changjin Lee, Ki Won Lim</i> .....	1113
A Interactive Molecular Modeling System Based on Web Service <i>Sungjun Park, Bosoon Kim, Jee-In Kim</i> .....	1117
On the Filter Size of DMM for Passive Scalar in Complex Flow <i>Yang Na, Dongshin Shin, Seungbae Lee</i> .....	1127
Visualization Process for Design and Manufacturing of End Mills <i>Sung-Lim Ko, Trung-Thanh Pham, Yong-Hyun Kim</i> .....	1133
IP Address Lookup with the Visualizable Biased Segment Tree <i>Inbok Lee, Jeong-Shik Mun, Sung-Ryul Kim</i> .....	1137
A Surface Reconstruction Algorithm Using Weighted Alpha Shapes <i>Si Hyung Park, Seoung Soo Lee, Jong Hwa Kim</i> .....	1141

## Sequential Data Analysis

HYBRID: From Atom-Clusters to Molecule-Clusters <i>Zhou Bing, Jun-yi Shen, Qin-ke Peng</i> .....	1151
A Fuzzy Adaptive Filter for State Estimation of Unknown Structural System and Evaluation for Sound Environment <i>Akira Ikuta, Hisako Masuike, Yegui Xiao, Mitsuo Ohta</i> .....	1161
Preventing Meaningless Stock Time Series Pattern Discovery by Changing Perceptually Important Point Detection <i>Tak-chung Fu, Fu-lai Chung, Robert Luk, Chak-man Ng</i> .....	1171
Discovering Frequent Itemsets Using Transaction Identifiers <i>Duckjin Chai, Heeyoung Choi, Buhyun Hwang</i> .....	1175
Incremental DFT Based Search Algorithm for Similar Sequence <i>Quan Zheng, Zhikai Feng, Ming Zhu</i> .....	1185

## Parallel and Distributed Data Mining

Computing High Dimensional MOLAP with Parallel Shell Mini-cubes <i>Kong-fa Hu, Chen Ling, Shen Jie, Gu Qi, Xiao-li Tang</i> .....	1192
--	------

Sampling Ensembles for Frequent Patterns <i>Caiyan Jia, Ruqian Lu</i> .....	1197
Distributed Data Mining on Clusters with Bayesian Mixture Modeling <i>M. Viswanathan, Y.K. Yang, T.K. Whangbo</i> .....	1207
A Method of Data Classification Based on Parallel Genetic Algorithm <i>Yuexiang Shi, Zuqiang Meng, Zixing Cai, B. Benhabib</i> .....	1217

## Rough Sets

Rough Computation Based on Similarity Matrix <i>Huang Bing, Guo Ling, He Xin, Xian-zhong Zhou</i> .....	1223
The Relationship Among Several Knowledge Reduction Approaches <i>Keyun Qin, Zheng Pei, Weifeng Du</i> .....	1232
Rough Approximation of a Preference Relation for Stochastic Multi-attribute Decision Problems <i>Chaoyuan Yue, Shengbao Yao, Peng Zhang, Wanan Cui</i> .....	1242
Incremental Target Recognition Algorithm Based on Improved Discernibility Matrix <i>Liu Yong, Xu Congfu, Yan Zhiyong, Pan Yunhe</i> .....	1246
Problems Relating to the Phonetic Encoding of Words in the Creation of a Phonetic Spelling Recognition Program <i>Michael Higgins, Wang Shudong</i> .....	1256
Diversity Measure for Multiple Classifier Systems <i>Qinghua Hu, Daren Yu</i> .....	1261
A Successive Design Method of Rough Controller Using Extra Excitation <i>Geng Wang, Jun Zhao, Jixin Qian</i> .....	1266
A Soft Sensor Model Based on Rough Set Theory and Its Application in Estimation of Oxygen Concentration <i>Xingsheng Gu, Dazhong Sun</i> .....	1271
A Divide-and-Conquer Discretization Algorithm <i>Fan Min, Lijun Xie, Qihe Liu, Hongbin Cai</i> .....	1277
A Hybrid Classifier Based on Rough Set Theory and Support Vector Machines <i>Gezhang Zhang, Zhixin Cao, Yajun Gu</i> .....	1287

A Heuristic Algorithm for Maximum Distribution Reduction <i>Xiaobing Pei, YuanZhen Wang</i> .....	1297
The Minimization of Axiom Sets Characterizing Generalized Fuzzy Rough Approximation Operators <i>Xiao-Ping Yang</i> .....	1303
The Representation and Resolution of Rough Sets Based on the Extended Concept Lattice <i>Xuegang Hu, Yuhong Zhang, Xinya Wang</i> .....	1309
Study of Integrate Models of Rough Sets and Grey Systems <i>Wu Shunxiang, Liu Sifeng, Li Maoqing</i> .....	1313
<b>Author Index</b> .....	1325



# Table of Contents – Part II

## Dimensionality Reduction

Dimensionality Reduction for Semi-supervised Face Recognition <i>Weiwei Du, Kohei Inoue, Kiichi Urahama</i> .....	1
Cross-Document Transliterated Personal Name Coreference Resolution <i>Houfeng Wang</i> .....	11
Difference-Similitude Matrix in Text Classification <i>Xiaochun Huang, Ming Wu, Delin Xia, Puliu Yan</i> .....	21
A Study on Feature Selection for Toxicity Prediction <i>Gongde Guo, Daniel Neagu, Mark T.D. Cronin</i> .....	31
Application of Feature Selection for Unsupervised Learning in Prosecutors' Office <i>Peng Liu, Jiaxian Zhu, Lanjuan Liu, Yanhong Li, Xuefeng Zhang</i> .....	35
A Novel Field Learning Algorithm for Dual Imbalance Text Classification <i>Ling Zhuang, Honghua Dai, Xiaoshu Hang</i> .....	39
Supervised Learning for Classification <i>Hongyu Li, Wenbin Chen, I-Fan Shen</i> .....	49
Feature Selection for Hyperspectral Data Classification Using Double Parallel Feedforward Neural Networks <i>Mingyi He, Rui Huang</i> .....	58
Robust Nonlinear Dimension Reduction: A Self-organizing Approach <i>Yuexian Hou, Liyue Yao, Pilian He</i> .....	67
An Effective Feature Selection Scheme via Genetic Algorithm Using Mutual Information <i>Chunkai K. Zhang, Hong Hu</i> .....	73

**Pattern Recognition and Trend Analysis**

Pattern Classification Using Rectified Nearest Feature Line Segment  
*Hao Du, Yan Qiu Chen* . . . . . 81

Palmprint Identification Algorithm Using Hu Invariant Moments  
*Jin Soo Noh, Kang Hyeon Rhee* . . . . . 91

Generalized Locally Nearest Neighbor Classifiers for Object Classification  
*Wenming Zheng, Cairong Zou, Li Zhao* . . . . . 95

Nearest Neighbor Classification Using Cam Weighted Distance  
*Chang Yin Zhou, Yan Qiu Chen* . . . . . 100

A PPM Prediction Model Based on Web Objects’ Popularity  
*Lei Shi, Zhimin Gu, Yunxia Pei, Lin Wei* . . . . . 110

An On-line Sketch Recognition Algorithm for Composite Shape  
*Zhan Ding, Yin Zhang, Wei Peng, Xiuzi Ye, Huaqiang Hu* . . . . . 120

Axial Representation of Character by Using Wavelet Transform  
*Xinge You, Bin Fang, Yuan Yan Tang, Luoqing Li, Dan Zhang* . . . . . 130

Representing and Recognizing Scenario Patterns  
*Jixin Ma, Bin Luo* . . . . . 140

A Hybrid Artificial Intelligent-Based Criteria-Matching with Classification Algorithm  
*Alex T.H. Sim, Vincent C.S. Lee* . . . . . 150

Auto-generation of Detection Rules with Tree Induction Algorithm  
*Minsoo Kim, Jae-Hyun Seo, Il-Ahn Cheong, Bong-Nam Noh* . . . . . 160

Hand Gesture Recognition System Using Fuzzy Algorithm and RDBMS for Post PC  
*Jung-Hyun Kim, Dong-Gyu Kim, Jeong-Hoon Shin, Sang-Won Lee, Kwang-Seok Hong* . . . . . 170

An Ontology-Based Method for Project and Domain Expert Matching  
*Jiangning Wu, Guangfei Yang* . . . . . 176

Pattern Classification and Recognition of Movement Behavior of Medaka (*Oryzias Latipes*) Using Decision Tree  
*Sengtai Lee, Jeehoon Kim, Jae-Yeon Baek, Man-Wi Han, Tae-Soo Chon* . . . . . 186

A New Algorithm for Computing the Minimal Enclosing Sphere in Feature Space <i>Chonghui Guo, Mingyu Lu, Jiantao Sun, Yuchang Lu</i> .....	196
Y-AOI: Y-Means Based Attribute Oriented Induction Identifying Root Cause for IDSs <i>Jungtae Kim, Gunhee Lee, Jung-taek Seo, Eung-ki Park, Choon-sik Park, Dong-kyoo Kim</i> .....	205
New Segmentation Algorithm for Individual Offline Handwritten Character Segmentation <i>K.B.M.R. Batuwita, G.E.M.D.C. Bandara</i> .....	215
A Method Based on the Continuous Spectrum Analysis for Fingerprint Image Ridge Distance Estimation <i>Xiaosi Zhan, Zhaocai Sun, Yilong Yin, Yayun Chu</i> .....	230
A Method Based on the Markov Chain Monte Carlo for Fingerprint Image Segmentation <i>Xiaosi Zhan, Zhaocai Sun, Yilong Yin, Yun Chen</i> .....	240
Unsupervised Speaker Adaptation for Phonetic Transcription Based Voice Dialing <i>Weon-Goo Kim, MinSeok Jang, Chin-Hui Lee</i> .....	249
A Phase-Field Based Segmentation Algorithm for Jacquard Images Using Multi-start Fuzzy Optimization Strategy <i>Zhilin Feng, Jianwei Yin, Hui Zhang, Jinxiang Dong</i> .....	255
Dynamic Modeling, Prediction and Analysis of Cytotoxicity on Microelectronic Sensors <i>Biao Huang, James Z. Xing</i> .....	265
Generalized Fuzzy Morphological Operators <i>Tingquan Deng, Yanmei Chen</i> .....	275
Signature Verification Method Based on the Combination of Shape and Dynamic Feature <i>Yingna Deng, Hong Zhu, Shu Li, Tao Wang</i> .....	285
Study on the Matching Similarity Measure Method for Image Target Recognition <i>Xiaogang Yang, Dong Miao, Fei Cao, Yongkang Ma</i> .....	289
3-D Head Pose Estimation for Monocular Image <i>Yingjie Pan, Hong Zhu, Ruirui Ji</i> .....	293

The Speech Recognition Based on the Bark Wavelet Front-End Processing  
*Xueying Zhang, Zhiping Jiao, Zhefeng Zhao* . . . . . 302

An Accurate and Fast Iris Location Method Based on the Features of Human Eyes  
*Weiqi Yuan, Lu Xu, Zhonghua Lin* . . . . . 306

A Hybrid Classifier for Mass Classification with Different Kinds of Features in Mammography  
*Ping Zhang, Kuldeep Kumar, Brijesh Verma* . . . . . 316

Data Mining Methods for Anomaly Detection of HTTP Request Exploitations  
*Xiao-Feng Wang, Jing-Li Zhou, Sheng-Sheng Yu, Long-Zheng Cai* . . . 320

Exploring Content-Based and Image-Based Features for Nude Image Detection  
*Shi-lin Wang, Hong Hui, Sheng-hong Li, Hao Zhang, Yong-yu Shi, Wen-tao Qu* . . . . . 324

Collision Recognition and Direction Changes Using Fuzzy Logic for Small Scale Fish Robots by Acceleration Sensor Data  
*Seung Y. Na, Daejung Shin, Jin Y. Kim, Su-Il Choi* . . . . . 329

Fault Diagnosis Approach Based on Qualitative Model of Signed Directed Graph and Reasoning Rules  
*Bingshu Wang, Wenliang Cao, Liangyu Ma, Ji Zhang* . . . . . 339

Visual Tracking Algorithm for Laparoscopic Robot Surgery  
*Min-Seok Kim, Jin-Seok Heo, Jung-Ju Lee* . . . . . 344

Toward a Sound Analysis System for Telemedicine  
*Cong Phuong Nguyen, Thi Ngoc Yen Pham, Castelli Eric* . . . . . 352

**Other Topics in FSKD Methods**

Structural Learning of Graphical Models and Its Applications to Traditional Chinese Medicine  
*Ke Deng, Delin Liu, Shan Gao, Zhi Geng* . . . . . 362

Study of Ensemble Strategies in Discovering Linear Causal Models  
*Gang Li, Honghua Dai* . . . . . 368

The Entropy of Relations and a New Approach for Decision Tree Learning <i>Dan Hu, HongXing Li</i> .....	378
Effectively Extracting Rules from Trained Neural Networks Based on the New Measurement Method of the Classification Power of Attributes <i>Dexian Zhang, Yang Liu, Ziqiang Wang</i> .....	388
EDTs: Evidential Decision Trees <i>Huawei Guo, Wenkang Shi, Feng Du</i> .....	398
GSMA: A Structural Matching Algorithm for Schema Matching in Data Warehousing <i>Wei Cheng, Yufang Sun</i> .....	408
A New Algorithm to Get the Correspondences from the Image Sequences <i>Zhiquan Feng, Xiangru Meng, Chenglei Yang</i> .....	412
An Efficiently Algorithm Based on Itemsets-Lattice and Bitmap Index for Finding Frequent Itemsets <i>Fuzan Chen, Mingqiang Li</i> .....	420
Weighted Fuzzy Queries in Relational Databases <i>Ying-Chao Zhang, Yi-Fei Chen, Xiao-ling Ye, Jie-Liang Zheng</i> .....	430
Study of Multiuser Detection: The Support Vector Machine Approach <i>Tao Yang, Bo Hu</i> .....	442
Robust and Adaptive Backstepping Control for Nonlinear Systems Using Fuzzy Logic Systems <i>Gang Chen, Shuqing Wang, Jianming Zhang</i> .....	452
Online Mining Dynamic Web News Patterns Using Machine Learn Methods <i>Jian-Wei Liu, Shou-Jian Yu, Jia-Jin Le</i> .....	462
A New Fuzzy MCDM Method Based on Trapezoidal Fuzzy AHP and Hierarchical Fuzzy Integral <i>Chao Zhang, Cun-bao Ma, Jia-dong Xu</i> .....	466
Fast Granular Analysis Based on Watershed in Microscopic Mineral Images <i>Danping Zou, Desheng Hu, Qizhen Liu</i> .....	475

Cost-Sensitive Ensemble of Support Vector Machines for Effective Detection of Microcalcification in Breast Cancer Diagnosis <i>Yonghong Peng, Qian Huang, Ping Jiang, Jianmin Jiang</i> .....	483
High-Dimensional Shared Nearest Neighbor Clustering Algorithm <i>Jian Yin, Xianli Fan, Yiqun Chen, Jiangtao Ren</i> .....	494
A New Method for Fuzzy Group Decision Making Based on $\alpha$ -Level Cut and Similarity <i>Jibin Lan, Liping He, Zhongxing Wang</i> .....	503
Modeling Nonlinear Systems: An Approach of Boosted Linguistic Models <i>Keun-Chang Kwak, Witold Pedrycz, Myung-Geun Chun</i> .....	514
Multi-criterion Fuzzy Optimization Approach to Imaging from Incomplete Projections <i>Xin Gao, Shuqian Luo</i> .....	524
Transductive Knowledge Based Fuzzy Inference System for Personalized Modeling <i>Qun Song, Tianmin Ma, Nikola Kasabov</i> .....	528
A Sampling-Based Method for Mining Frequent Patterns from Databases <i>Yen-Liang Chen, Chin-Yuan Ho</i> .....	536
Lagrange Problem in Fuzzy Reversed Posynomial Geometric Programming <i>Bing-yuan Cao</i> .....	546
Direct Candidates Generation: A Novel Algorithm for Discovering Complete Share-Frequent Itemsets <i>Yu-Chiang Li, Jieh-Shan Yeh, Chin-Chen Chang</i> .....	551
A Three-Step Preprocessing Algorithm for Minimizing E-Mail Document's Atypical Characteristics <i>Ok-Ran Jeong, Dong-Sub Cho</i> .....	561
Failure Detection Method Based on Fuzzy Comprehensive Evaluation for Integrated Navigation System <i>Guoliang Liu, Yingchun Zhang, Wenyi Qiang, Zengqi Sun</i> .....	567
Product Quality Improvement Analysis Using Data Mining: A Case Study in Ultra-Precision Manufacturing Industry <i>Hailiang Huang, Dianliang Wu</i> .....	577

Two-Tier Based Intrusion Detection System <i>Byung-Joo Kim, Il Kon Kim</i> .....	581
SuffixMiner: Efficiently Mining Frequent Itemsets in Data Streams by Suffix-Forest <i>Lifeng Jia, Chunguang Zhou, Zhe Wang, Xiujuan Xu</i> .....	592
Improvement of Lee-Kim-Yoo's Remote User Authentication Scheme Using Smart Cards <i>Da-Zhi Sun, Zhen-Fu Cao</i> .....	596
<b>Mining of Spatial, Textual, Image and Time-Series Data</b>	
Grapheme-to-Phoneme Conversion Based on a Fast TBL Algorithm in Mandarin TTS Systems <i>Min Zheng, Qin Shi, Wei Zhang, Lianhong Cai</i> .....	600
Clarity Ranking for Digital Images <i>Shutao Li, Guangsheng Chen</i> .....	610
Attribute Uncertainty in GIS Data <i>Shuliang Wang, Wenzhong Shi, Hanning Yuan, Guoqing Chen</i> .....	614
Association Classification Based on Sample Weighting <i>Jin Zhang, Xiaoyun Chen, Yi Chen, Yunfa Hu</i> .....	624
Using Fuzzy Logic for Automatic Analysis of Astronomical Pipelines <i>Lior Shamir, Robert J. Nemiroff</i> .....	634
On the On-line Learning Algorithms for EEG Signal Classification in Brain Computer Interfaces <i>Shiliang Sun, Changshui Zhang, Naijiang Lu</i> .....	638
Automatic Keyphrase Extraction from Chinese News Documents <i>Houfeng Wang, Sujian Li, Shiwen Yu</i> .....	648
A New Model of Document Structure Analysis <i>Zhiqi Wang, Yongcheng Wang, Kai Gao</i> .....	658
Prediction for Silicon Content in Molten Iron Using a Combined Fuzzy-Associative-Rules Bank <i>Shi-hua Luo, Xiang-guan Liu, Min Zhao</i> .....	667

An Investigation into the Use of Delay Coordinate Embedding Technique with MIMO ANFIS for Nonlinear Prediction of Chaotic Signals <i>Jun Zhang, Weiwei Dai, Muhui Fan, Henry Chung, Zhi Wei, D. Bi</i> .....	677
Replay Scene Based Sports Video Abstraction <i>Jian-quan Ouyang, Jin-tao Li, Yong-dong Zhang</i> .....	689
Mapping Web Usage Patterns to MDP Model and Mining with Reinforcement Learning <i>Yang Gao, Zongwei Luo, Ning Li</i> .....	698
Study on Wavelet-Based Fuzzy Multiscale Edge Detection Method <i>Wen Zhu, Beiping Hou, Zhegen Zhang, Kening Zhou</i> .....	703
Sense Rank AALesk: A Semantic Solution for Word Sense Disambiguation <i>Yiqun Chen, Jian Yin</i> .....	710
Automatic Video Knowledge Mining for Summary Generation Based on Un-supervised Statistical Learning <i>Jian Ling, Yiqun Lian, Yueting Zhuang</i> .....	718
A Model for Classification of Topological Relationships Between Two Spatial Objects <i>Wu Yang, Ya Luo, Ping Guo, HuangFu Tao, Bo He</i> .....	723
A New Feature of Uniformity of Image Texture Directions Coinciding with the Human Eyes Perception <i>Xing-Jian He, Yue Zhang, Tat-Ming Lok, Michael R. Lyu</i> .....	727
Sunspot Time Series Prediction Using Parallel-Structure Fuzzy System <i>Min-Soo Kim, Chan-Soo Chung</i> .....	731
A Similarity Computing Algorithm for Volumetric Data Sets <i>Tao Zhang, Wei Chen, Min Hu, Qunsheng Peng</i> .....	742
Extraction of Representative Keywords Considering Co-occurrence in Positive Documents <i>Byeong-Man Kim, Qing Li, KwangHo Lee, Bo-Yeong Kang</i> .....	752
On the Effective Similarity Measures for the Similarity-Based Pattern Retrieval in Multidimensional Sequence Databases <i>Seok-Lyong Lee, Ju-Hong Lee, Seok-Ju Chun</i> .....	762



Crossing the Language Barrier Using Fuzzy Logic <i>Rowena Chau, Chung-Hsing Yeh</i> .....	768
New Algorithm Mining Intrusion Patterns <i>Wu Liu, Jian-Ping Wu, Hai-Xin Duan, Xing Li</i> .....	774
Dual Filtering Strategy for Chinese Term Extraction <i>Xiaoming Chen, Xuening Li, Yi Hu, Ruzhan Lu</i> .....	778
White Blood Cell Segmentation and Classification in Microscopic Bone Marrow Images <i>Nipon Theera-Umpon</i> .....	787
KNN Based Evolutionary Techniques for Updating Query Cost Models <i>Zhining Liao, Hui Wang, David Glass, Gongde Guo</i> .....	797
A SVM Method for Web Page Categorization Based on Weight Adjustment and Boosting Mechanism <i>Mingyu Lu, Chonghui Guo, Jiantao Sun, Yuchang Lu</i> .....	801
<b>Fuzzy Systems in Bioinformatics and Bio-medical Engineering</b>	
Feature Selection for Specific Antibody Deficiency Syndrome by Neural Network with Weighted Fuzzy Membership Functions <i>Joon S. Lim, Tae W. Ryu, Ho J. Kim, Sudhir Gupta</i> .....	811
Evaluation and Fuzzy Classification of Gene Finding Programs on Human Genome Sequences <i>Atulya Nagar, Sujita Purushothaman, Hissam Tawfik</i> .....	821
Application of a Genetic Algorithm — Support Vector Machine Hybrid for Prediction of Clinical Phenotypes Based on Genome-Wide SNP Profiles of Sib Pairs <i>Binsheng Gong, Zheng Guo, Jing Li, Guohua Zhu, Sali Lv, Shaoqi Rao, Xia Li</i> .....	830
A New Method for Gene Functional Prediction Based on Homologous Expression Profile <i>Sali Lv, Qianghu Wang, Guangmei Zhang, Fengxia Wen, Zhenzhen Wang, Xia Li</i> .....	836

Analysis of Sib-Pair IBD Profiles and Genomic Context for Identification  
of the Relevant Molecular Signatures for Alcoholism  
*Chuanxing Li, Lei Du, Xia Li, Binsheng Gong, Jie Zhang,  
Shaoqi Rao* . . . . . 845

A Novel Ensemble Decision Tree Approach for Mining Genes Coding  
Ion Channels for Cardiopathy Subtype  
*Jie Zhang, Xia Li, Wei Jiang, Yanqiu Wang, Chuanxing Li,  
Qiuju Wang, Shaoqi Rao* . . . . . 852

A Permutation-Based Genetic Algorithm for Predicting RNA  
Secondary Structure — A Practicable Approach  
*Yongqiang Zhan, Maozu Guo* . . . . . 861

G Protein Binding Sites Analysis  
*Fan Zhang, Zhicheng Liu, Xia Li, Shaoqi Rao* . . . . . 865

A Novel Feature Ensemble Technology to Improve Prediction  
Performance of Multiple Heterogeneous Phenotypes Based on  
Microarray Data  
*Haiyun Wang, Qingpu Zhang, Yadong Wang, Xia Li, Shaoqi Rao,  
Zuquan Ding* . . . . . 869

**Fuzzy Systems in Expert System and Informatics**

Fuzzy Routing in QoS Networks  
*Runtong Zhang, Xiaomin Zhu* . . . . . 880

Component Content Soft-Sensor Based on Adaptive Fuzzy System in  
Rare-Earth Countercurrent Extraction Process  
*Hui Yang, Chonghui Song, Chunyan Yang, Tianyou Chai* . . . . . 891

The Fuzzy-Logic-Based Reasoning Mechanism for Product Development  
Process  
*Ying-Kui Gu, Hong-Zhong Huang, Wei-Dong Wu,  
Chun-Sheng Liu* . . . . . 897

Single Machine Scheduling Problem with Fuzzy Precedence Delays and  
Fuzzy Processing Times  
*Yuan Xie, Jianying Xie, Jun Liu* . . . . . 907

Fuzzy-Based Dynamic Bandwidth Allocation System  
*Fang-Yie Leu, Shi-Jie Yan, Wen-Kui Chang* . . . . . 911

Self-localization of a Mobile Robot by Local Map Matching Using Fuzzy Logic <i>Jinxia Yu, Zixing Cai, Xiaobing Zou, Zhuohua Duan</i> . . . . .	921
Navigation of Mobile Robots in Unstructured Environment Using Grid Based Fuzzy Maps <i>Özhan Karaman, Hakan Temelta</i> . . . . .	925
A Fuzzy Mixed Projects and Securities Portfolio Selection Model <i>Yong Fang, K.K. Lai, Shou-Yang Wang</i> . . . . .	931
Contract Net Protocol Using Fuzzy Case Based Reasoning <i>Wunan Wan, Xiaojing Wang, Yang Liu</i> . . . . .	941
A Fuzzy Approach for Equilibrium Programming with Simulated Annealing Algorithm <i>Jie Su, Junpeng Yuan, Qiang Han, Jin Huang</i> . . . . .	945
Image Processing Application with a TSK Fuzzy Model <i>Perfecto Mariño, Vicente Pastoriza, Miguel Santamaría, Emilio Martínez</i> . . . . .	950
A Fuzzy Dead Reckoning Algorithm for Distributed Interactive Applications <i>Ling Chen, Gencai Chen</i> . . . . .	961
Intelligent Automated Negotiation Mechanism Based on Fuzzy Method <i>Hong Zhang, Yuhui Qiu</i> . . . . .	972
Congestion Control in Differentiated Services Networks by Means of Fuzzy Logic <i>Morteza Mosavi, Mehdi Galily</i> . . . . .	976

## **Fuzzy Systems in Pattern Recognition and Diagnostics**

Fault Diagnosis System Based on Rough Set Theory and Support Vector Machine <i>Yitian Xu, Laisheng Wang</i> . . . . .	980
A Fuzzy Framework for Flashover Monitoring <i>Chang-Gun Um, Chang-Gi Jung, Byung-Gil Han, Young-Chul Song, Doo-Hyun Choi</i> . . . . .	989

Feature Recognition Technique from 2D Ship Drawings Using Fuzzy Inference System  
*Deok-Eun Kim, Sung-Chul Shin, Soo-Young Kim* ..... 994

Transmission Relay Method for Balanced Energy Depletion in Wireless Sensor Networks Using Fuzzy Logic  
*Seung-Beom Baeg, Tae-Ho Cho* ..... 998

Validation and Comparison of Microscopic Car-Following Models Using Beijing Traffic Flow Data  
*Dewang Chen, Yueming Yuan, Baiheng Li, Jianping Wu*..... 1008

Apply Fuzzy-Logic-Based Functional-Center Hierarchies as Inference Engines for Self-learning Manufacture Process Diagnoses  
*Yu-Shu Hu, Mohammad Modarres* ..... 1012

Fuzzy Spatial Location Model and Its Application in Spatial Query  
*Yongjian Yang, Chunling Cao* ..... 1022

Segmentation of Multimodality Osteosarcoma MRI with Vectorial Fuzzy-Connectedness Theory  
*Jing Ma, Minglu Li, Yongqiang Zhao* ..... 1027

**Knowledge Discovery in Bioinformatics and Bio-medical Engineering**

A Global Optimization Algorithm for Protein Folds Prediction in 3D Space  
*Xiaoguang Liu, Gang Wang, Jing Liu* ..... 1031

Classification Analysis of SAGE Data Using Maximum Entropy Model  
*Jin Xin, Rongfang Bie*..... 1037

DNA Sequence Identification by Statistics-Based Models  
*Jitimon Keinduangjun, Punpiti Piamsa-nga, Yong Poovorawan* ..... 1041

A New Method to Mine Gene Regulation Relationship Information  
*De Pan, Fei Wang, Jiankui Guo, Jianhua Ding*..... 1051

**Knowledge Discovery in Expert System and Informatics**

Shot Transition Detection by Compensating for Global and Local Motions  
*Seok-Woo Jang, Gye-Young Kim, Hyung-Il Choi* ..... 1061

Hybrid Methods for Stock Index Modeling <i>Yuehui Chen, Ajith Abraham, Ju Yang, Bo Yang</i> .....	1067
Designing an Intelligent Web Information System of Government Based on Web Mining <i>Gye Hang Hong, Jang Hee Lee</i> .....	1071
Automatic Segmentation and Diagnosis of Breast Lesions Using Morphology Method Based on Ultrasound <i>In-Sung Jung, Devinder Thapa, Gi-Nam Wang</i> .....	1079
Composition of Web Services Using Ontology with Monotonic Inheritance <i>Changyun Li, Beishui Liao, Aimin Yang, Lijun Liao</i> .....	1089
Ontology-DTD Matching Algorithm for Efficient XML Query <i>Myung Sook Kim, Yong Hae Kong</i> .....	1093
An Approach to Web Service Discovery Based on the Semantics <i>Jing Fan, Bo Ren, Li-Rong Xiong</i> .....	1103
Non-deterministic Event Correlation Based on C-F Model <i>Qiuhua Zheng, Yuntao Qian, Min Yao</i> .....	1107
Flexible Goal Recognition via Graph Construction and Analysis <i>Minghao Yin, Wenxiang Gu, Yinghua Lu</i> .....	1118
An Implementation for Mapping SBML to BioSPI <i>Zhupeng Dong, Xiaoju Dong, Xian Xu, Yuxi Fu, Zhizhou Zhang, Lin He</i> .....	1128
Knowledge-Based Faults Diagnosis System for Wastewater Treatment <i>Jang-Hwan Park, Byong-Hee Jun, Myung-Geun Chun</i> .....	1132
Study on Intelligent Information Integration of Knowledge Portals <i>Yongjin Zhang, Hongqi Chen, Jiancang Xie</i> .....	1136
The Risk Identification and Assessment in E-Business Development <i>Lin Wang, Yurong Zeng</i> .....	1142
A Novel Wavelet Transform Based on Polar Coordinates for Datamining Applications <i>Seonggoo Kang, Sangjun Lee, Sukho Lee</i> .....	1150

Impact on the Writing Granularity for Incremental Checkpointing  
*Junyoung Heo, Xuefeng Piao, Sangho Yi, Geunyoung Park,*  
*Minkyu Park, Jiman Hong, Yookun Cho* ..... 1154

Using Feedback Cycle for Developing an Adjustable Security Design  
Metric  
*Charlie Y. Shim, Jung Y. Kim, Sung Y. Shin, Jiman Hong* ..... 1158

w-LLC: Weighted Low-Energy Localized Clustering for Embedded  
Networked Sensors  
*Joongheon Kim, Wonjun Lee, Eunkyo Kim, Choonhwa Lee* ..... 1162

Energy Efficient Dynamic Cluster Based Clock Synchronization for  
Wireless Sensor Network  
*Md. Mamun-Or-Rashid, Choong Seon Hong,*  
*Jinsung Cho* ..... 1166

An Intelligent Power Management Scheme for Wireless Embedded  
Systems Using Channel State Feedbacks  
*Hyukjun Oh, Jiman Hong, Heejune Ahn* ..... 1170

Analyze and Guess Type of Piece in the Computer Game Intelligent  
System  
*Z.Y. Xia, Y.A. Hu, J. Wang, Y.C. Jiang, X.L. Qin* ..... 1174

Large-Scale Ensemble Decision Analysis of Sib-Pair IBD Profiles  
for Identification of the Relevant Molecular Signatures for  
Alcoholism  
*Xia Li, Shaoqi Rao, Wei Zhang, Guo Zheng, Wei Jiang, Lei Du* ..... 1184

A Novel Visualization Classifier and Its Applications  
*Jie Li, Xiang Long Tang, Xia Li* ..... 1190

**Active Information Gathering on the Web**

Automatic Creation of Links: An Approach Based on Decision Tree  
*Peng Li, Seiji Yamada* ..... 1200

Extraction of Structural Information from the Web  
*Tsuyoshi Murata* ..... 1204

Blog Search with Keyword Map-Based Relevance Feedback  
*Yasufumi Takama, Tomoki Kajinami, Akio Matsumura* ..... 1208

An One Class Classification Approach to Non-relevance Feedback Document Retrieval <i>Takashi Onoda, Hiroshi Murata, Seiji Yamada</i> . . . . .	1216
Automated Knowledge Extraction from Internet for a Crisis Communication Portal <i>Ong Sing Goh, Chun Che Fung</i> . . . . .	1226
<b>Neural and Fuzzy Computation in Cognitive Computer Vision</b>	
Probabilistic Principal Surface Classifier <i>Kuiyu Chang, Joydeep Ghosh</i> . . . . .	1236
Probabilistic Based Recursive Model for Face Recognition <i>Siu-Yeung Cho, Jia-Jun Wong</i> . . . . .	1245
Performance Characterization in Computer Vision: The Role of Visual Cognition Theory <i>Aimin Wu, De Xu, Xu Yang, Jianhui Zheng</i> . . . . .	1255
Generic Solution for Image Object Recognition Based on Vision Cognition Theory <i>Aimin Wu, De Xu, Xu Yang, Jianhui Zheng</i> . . . . .	1265
Cognition Theory Motivated Image Semantics and Image Language <i>Aimin Wu, De Xu, Xu Yang, Jianhui Zheng</i> . . . . .	1276
Neuro-Fuzzy Inference System to Learn Expert Decision: Between Performance and Intelligibility <i>Laurence Cornez, Manuel Samuelides, Jean-Denis Muller</i> . . . . .	1281
Fuzzy Patterns in Multi-level of Satisfaction for MCDM Model Using Modified Smooth S-Curve MF <i>Pandian Vasant, A. Bhattacharya, N.N. Barsoum</i> . . . . .	1294
<b>Author Index</b> . . . . .	1305