Xue Li Osmar R. Zaïane Zhanhuai Li (Eds.)

Advanced Data Mining and Applications

Second International Conference, ADMA 2006 Xi'an, China, August 14-16, 2006 Proceedings



Series Editors

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

Volume Editors

Xue Li

The University of Queensland

School of Information Technology and Electronic Engineering

Queensland, Australia

E-mail: xueli@itee.uq.edu.au

Osmar R. Zaïane

University of Alberta, Canada E-mail: zaiane@cs.ualberta.ca

Zhanhuai Li

Northwest Polytechnical University, China

E-mail: lizhh@nwpu.edu.cn

Library of Congress Control Number: 2006930269

CR Subject Classification (1998): I.2, H.2.8, H.3-4, K.4.4, J.3, I.4, J.1

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN 0302-9743

ISBN-10 3-540-37025-0 Springer Berlin Heidelberg New York ISBN-13 978-3-540-37025-3 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 2006

Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India Printed on acid-free paper SPIN: 11811305 06/3142 5 4 3 2 1 0

Preface

The Second International Conference on Advanced Data Mining and Applications (ADMA) aimed at establishing its identity in the research community. The theme of ADMA is to focus on the innovative applications of data mining approaches to real-world problems that involve large data sets, incomplete and noisy data, or demand optimal solutions. Data mining is essentially a problem involving different knowledge of data, algorithms, and application domains. The first is about data that are regarded as the "first-class citizens" in application system development. Understanding data is always critical: their structures, high dimensionality, and their qualification and quantification issues. The second is about algorithms: their effectiveness, efficiency, scalability, and their applicability. Amongst a variety of applicable algorithms, selecting a right one to deal with a specific problem is always a challenge that demands contributions from the data mining research community. The third is on domain knowledge of applications. Without a good understanding of domain knowledge, data mining process is hardly able to avoid the GIGO (garbage in and garbage out) effect.

ADMA 2006 received 515 online submissions from 27 countries and regions. A screening process was applied before papers were assigned to reviewers. This eliminated approximately 5% of papers which were not relevant or not worthy for review. The rest of papers were peer reviewed by at least three reviewers consisting of international Program Committee members and external reviewers. We finally accepted 115 papers including 41 regular papers and 74 short papers, yielding a total acceptance rate of 22.3%. For quality control, we conducted a cross-check on the submitted papers for any possible duplicated submissions to four other related concurrent international conferences. Joint actions were taken by the Program Committee Co-chairs from the involved conferences to reject papers that were doubly submitted. In this case, 15 papers were rejected without review crossing PRICAI 2006, ICIC 2006, and ADMA 2006. Two papers were rejected after the acceptance notifications because they appeared in the acceptance list of ICNC-FSKD 2006. While this exercise was very time consuming, it was necessary and we hope that it will send out a message that double submissions are not tolerated in our research community.

The ADMA 2006 program highlights were three keynote speeches from outstanding researchers in advanced data mining and application areas: Usama Fayyad, Jiawei Han, and Ah Chung Tsoi. The conference also invited researchers from two international universities to report on their newest research findings.

August 2006 Xue Li Osmar Zaïane Zhanhuai Li

Conference Committee

ADMA 2006 was organized by the University of Queensland, Australia. The major sponsor was Xi'an Software Park, China (http://www.xasoftpark.com/). The other sponsor was WISE (Web Information Systems Engineering, http://www.i-wise.org/) Society. It was technically co-sponsored by IEEE Queensland Section. The local organization was undertaken by Xi'an Netec Network Technology Co. Ltd. (http://www.netecweb.com/english/company.asp).

Organization Committee

Conference Co-chairs Kyu-Young Whang (Korea Advanced Institute

of Science and Technology, Korea)

Chengqi Zhang (University of Technology, Syd-

ney, Australia)

Program Co-chairs Xue Li (University of Queensland, Australia)

Osmar Zaïane (University of Alberta, Canada) Zhanhuai Li (Northwest Polytechnical Univer-

sity, China)

Organizing Chairs Ailiang Mao (Xi'an Software Park, China)

Jian Chen (Xi'an Software Park-IBM Software

Innovation Centre, China)

Publicity Chairs Yonghong Peng (University of Bradford, UK)

Jinvan Li (Institute for Infocomm Research,

Singapore)

Web Master Roozbeh Derakhshan (University of Queens-

land, Australia)

Program Committee Members

Viorel Ariton Danubius University, Galati, Romania Michael Bain University of New South Wales, Australia

Elena Baralis Politecnico di Torino, Italy

Petr Berka University of Economics, Czech Republic Michael R. Berthold University of Constance, Germany

Fernando Berzal University of Granada, Spain

Francesco Bonchi CNR Pisa, Italy Jean-Francois Boulicaut INSA Lyon, France

Rui Camacho University of Porto, Portugal Xiaochun Cheng Middlesex University, UK Krzysztof Cios University of Colorado, USA

VIII Organization

Bruno Cremilleux Universite de Caen, France Luc Dehaspe PharmaDM, Belgium

Zhaoyang Dong University of Queensland, Australia

Hao Fan Wuhan University, China

Hongjian Fan University of Melbourne Australia
Joao Gama University of Porto, Portugal
Dragan Gamberger Rudjer Boskovic Institute, Croatia
Jean-Gabriel Ganascia Universitè Pierre et Marie Curie, France
The University of New England, Australia

Christophe Giraud-Carrier Brigham Young University, USA Raul Giraldez Rojo University of Seville, Spain University of Antwerp, Belgium

Vladimir Gorodetsky
Yi Hong
The Russian Academy of Science, Russia
University of South Australia, Australia

Zhanyi Hu

Jimmy Huang

Ping Jiang

Academy of China, China

York University, Canada

Bradford University, UK

University of Porto, Portugal

Mehmed Kantardzic

University of Louisville, USA

Eamonn Keogh University of California, Riverside, USA

Tim Kovacs University of Bristol, UK

Adam Krzyzak Concordia University, Montreal, Canada

Andrew Kusiak University of Iowa, USA

Longin Jan Latecki Temple University Philadelphia, USA

Andre Ponce Leao University of SãoPaulo, Brazil Gang Li Deakin University, Australia

Qing Li

Xiaoli Li

Institute for Infocomm Research, Singapore

Xuemin Lin

Wanquan Liu

Giuseppe Manco

Hong Kong City University, Hong Kong, China

Institute for Infocomm Research, Singapore

University of New South Wales, Australia

Curtin University of Technology, Australia

National Research Council of Italy, Italy

Dunja Mladenic Jozef Stefan Institute, Slovenia

Iveta Mrazova Charles University, Prague, Czech Republic

Olfa Nasraoui University of Louisville, USA Daniel Neagu University of Bradford, UK

Claire Nedellec Laboratoire Mathèmatique, Informatique et

Gènome, France

Arlindo Oliveira Technical University of Lisbon, Portugal

Yonghong Peng University of Bradford, UK

Jan Rauch University of Economics, Prague, Czech Republic

Zbigniew W. Ras University of North Carolina, USA Cesar Rego University of Mississippi, USA

Christophe Rigotti
Joseph Roure
Vucel Saygin
Marc Sebban

INSA de Lyon, France
University of Mataro, Spain
Sabanci University, Turkey
University Jean Monnet, France

Giovanni Semeraro University of Bari, Italy

Seyed A. Shahrestani University of Western Sydney, Sydney, Australia

Carlos Soares University of Porto, Portugal

Ah-Hwee Tan Nanyang Technological University, Singapore Kay Chen Tan National University of Singapore, Singapore Kok Kiong Tan National University of Singapore, Singapore Arthur Tay National University of Singapore, Singapore

Luis Torgo University of Porto, Portugal Shusaku Tsumoto Shimane Medical University, Japan Brijesh Verma Central Queensland University, Australia

Ricardo Vilalta University of Houston, USA

Paul Vitanyi CWI and University of Amsterdam, The Netherlands

Dianhui Wang La Trobe University, Melbourne, Australia

Ke Wang Simon Fraser University, Canada

Shuliang Wang Wuhan University, China

Wei Wang University of North Carolina, USA Hau San Wong City University of Hong Kong, China

Dash Wu University of Toronto, Canada Dongming Xu University of Queensland, Australia

Qiang Yang Hong Kong University of Science and Technology,

China

Zijiang Yang York University, Canada

Mao Ye Electronic Science and Technology, China

Jie Yin Hong Kong University of Science and Technology,

China

Gerson Zaverucha Federal University of Rio de Janeiro, Brazil

Sarah Zelikovitz College of Staten Island, NY

Shichao Zhang University of Technology, Sydney, Australia

Shuigeng Zhou Fudan University, China Zhi-Hua Zhou Nanjin University, China Zhanli Zhu Xi'an Shiyou University, China

External Reviewers

Mona Salman Hatam Al-Jiboori
Domingo S. Rodríguez Baena
Beatriz Pontes Balanza
Miguel Bugalho
Alexandra Carvalho

Sultan Qaboos University, Oman
University of Seville, Spain

Ming Chang University of Queensland, Australia Dingyi Chen University of Queensland, Australia

Luíis Pedro Coelho IST/INESC-ID, Portugal

Marian Craciun University "Dunarea de Jos" of Galati,

Romania

Roozbeh Derakhshan University of Queensland, Australia

Organization

Yi Ding Xiaoshu Hang Petr Hoffmann Pavel Jiroutek

Χ

Alexandre Francisco Ana Teresa Freitas

Gongde Guo Yang Lan Sara C. Madeira

Ladan Malazizi André Luís Martins Frantisek Mraz

Juggapong Natwichai Son Nguyen Nhu

Jia Rong

Luís Silveira Russo

Sule Simsek Xingzhi Sun

Osman Okyar Tahaoglu Han (Carol) Tang Li-Shiang Tsay

Yiqing Tu Angelina Tzacheva

Xin Yan Ling Zhuang University of Queensland, Australia

Deakin University, Australia

Charles University, Prague, Czech Republic Charles University, Prague, Czech Republic

IST/INESC-ID, Portugal IST/INESC-ID, Portugal University of Bradford, UK University of Bradford, UK UBI/INESC-ID/IST, Portugal University of Bradford, UK IST/INESC-ID, Portugal

Charles University, Prague, Czech Republic

University of Queensland, Australia University of Queensland, Australia

Deakin University, Australia IST/INESC-ID, Portugal

University of Missouri-Rolla, USA University of Queensland, Australia Dokuz Eylul University, Turkey University of Missouri-Rolla, USA

Hampton University, USA Deakin University, Australia

University of South Carolina Upstate, USA

University of Queensland, Australia

Deakin University, Australia

Table of Contents

Invited Papers

Warehousing and Mining Massive RFID Data Sets Jiawei Han, Hector Gonzalez, Xiaolei Li, Diego Klabjan	1
Self-organising Map Techniques for Graph Data Applications to Clustering of XML Documents A.C. Tsoi, M. Hagenbuchner, A. Sperduti	19
Finding Time Series Discords Based on Haar Transform Ada Wai-chee Fu, Oscar Tat-Wing Leung, Eamonn Keogh, Jessica Lin	31
Learning with Local Drift Detection João Gama, Gladys Castillo	42
Association Rules	
A Fast Algorithm for Maintenance of Association Rules in Incremental Databases Xin Li, Zhi-Hong Deng, Shiwei Tang	56
Extending OLAP with Fuzziness for Effective Mining of Fuzzy Multidimensional Weighted Association Rules Mehmet Kaya, Reda Alhajj	64
Incremental Maintenance of Association Rules Based on Multiple Previously Mined Results Zhuohua Duan, Zixing Cai, Yan Lv	72
Mining and Validation of Localized Frequent Web Access Patterns with Dynamic Tolerance Olfa Nasraoui, Suchandra Goswami	80
SA-IFIM: Incrementally Mining Frequent Itemsets in Update Distorted Databases	
Jinlong Wang, Congfu Xu, Hongwei Dan, Yunhe Pan	92

Study of Positive and Negative Association Rules Based on Multi-confidence and Chi-Squared Test Xiangjun Dong, Fengrong Sun, Xiqing Han, Ruilian Hou	100
Efficiently Mining Maximal Frequent Mutually Associated Patterns Zhongmei Zhou, Zhaohui Wu, Chunshan Wang, Yi Feng	110
Efficiently Mining Mutually and Positively Correlated Patterns Zhongmei Zhou, Zhaohui Wu, Chunshan Wang, Yi Feng	118
Classification	
ComEnVprs: A Novel Approach for Inducing Decision Tree Classifiers Shuqin Wang, Jinmao Wei, Junping You, Dayou Liu	126
Towards a Rough Classification of Business Travelers Rob Law, Thomas Bauer, Karin Weber, Tony Tse	135
Feature Extraction Based on Optimal Discrimination Plane in ECG Signal Classification Dingfei Ge, Xiao Qu	143
Music Style Classification with a Novel Bayesian Model Yatong Zhou, Taiyi Zhang, Jiancheng Sun	150
Classification of Polarimetric SAR Data Based on Multidimensional Watershed Clustering Wen Yang, Hao Wang, Yongfeng Cao, Haijian Zhang	157
An Effective Combination Based on Class-Wise Expertise of Diverse Classifiers for Predictive Toxicology Data Mining Daniel Neagu, Gongde Guo, Shanshan Wang	165
Robust Collective Classification with Contextual Dependency Network Models Yonghong Tian, Tiejun Huang, Wen Gao	173
User-Centered Image Semantics Classification Hongli Xu, De Xu, Fangshi Wang	181
A Performance Study of Gaussian Kernel Classifiers for Data Mining Applications Miyoung Shin	189

TTLSC – Transductive Total Least Square Model for Classification and Its Application in Medicine Qun Song, Tian Min Ma, Nikola Kasabov	197
Forecasting Electricity Market Price Spikes Based on Bayesian Expert with Support Vector Machines Wei Wu, Jianzhong Zhou, Li Mo, Chengjun Zhu	205
Integrating Local One-Class Classifiers for Image Retrieval Yiqing Tu, Gang Li, Honghua Dai	213
Incremental Discretization for Naïve-Bayes Classifier Jingli Lu, Ying Yang, Geoffrey I. Webb	223
Distance Guided Classification with Gene Expression Programming Lei Duan, Changjie Tang, Tianqing Zhang, Dagang Wei, Huan Zhang	239
Research on Multi-valued and Multi-labeled Decision Trees Hong Li, Rui Zhao, Jianer Chen, Yao Xiang	247
Clustering	
A Spatial Clustering Algorithm Based on SOFM Zhong Qu, Lian Wang	255
Mining Spatial-temporal Clusters from Geo-databases Min Wang, Aiping Wang, Anbo Li	263
A Fuzzy Subspace Algorithm for Clustering High Dimensional Data Guojun Gan, Jianhong Wu, Zijiang Yang	271
Robust Music Information Retrieval on Mobile Network Based on Multi-Feature Clustering Won-Jung Yoon, Sanghun Oh, Kyu-Sik Park	279
Joint Cluster Based Co-clustering for Clustering Ensembles Tianming Hu, Liping Liu, Chao Qu, Sam Yuan Sung	284
Mining Gait Pattern for Clinical Locomotion Diagnosis Based on Clustering Techniques Guandong Xu, Yanchun Zhang, Rezaul Begg	296
Combining Multiple Clusterings Via k-Modes Algorithm Huilan Luo, Fansheng Kong, Yixiao Li	308

HOV ³ : An Approach to Visual Cluster Analysis Ke-Bing Zhang, Mehmet A. Orgun, Kang Zhang	316
A New Fuzzy Co-clustering Algorithm for Categorization of Datasets with Overlapping Clusters William-Chandra Tjhi, Lihui Chen	328
Quantum-Behaved Particle Swarm Optimization Clustering Algorithm Jun Sun, Wenbo Xu, Bin Ye	340
Clustering Mixed Data Based on Evidence Accumulation Huilan Luo, Fansheng Kong, Yixiao Li	348
Mining Maximal Local Conserved Gene Clusters from Microarray Data Yuhai Zhao, Guoren Wang, Ying Yin, Guangyu Xu	356
Novel Algorithms	
A Novel P2P Information Clustering and Retrieval Mechanism Huaxiang Zhang, Peide Liu	364
Keeping Track of Customer Life Cycle to Build Customer Relationship Sung Ho Ha, Sung Min Bae	372
Mining of Flexible Manufacturing System Using Work Event Logs and Petri Nets Hesuan Hu, Zhiwu Li, Anrong Wang	380
Improved Genetic Algorithm for Multiple Sequence Alignment Using Segment Profiles (GASP) Yanping Lv, Shaozi Li, Changle Zhou, Wenzhong Guo, Zhengming Xu	388
A Novel Visual Clustering Algorithm for Finding Community in Complex Network Shuzhong Yang, Siwei Luo, Jianyu Li	396
Self-Organizing Network Evolving Model for Mining Network Community Structure Bo Yang	404
An Interactive Visualization Environment for Data Exploration Using Points of Interest David Da Costa, Gilles Venturini	416

Guanghui Yan, Zhanhuai Li, Liu Yuan

542

Feature Selection for Complex Patterns Peter Schenkel, Wanqing Li, Wanquan Liu	550
Naïve Bayesian Tree Pruning by Local Accuracy Estimation Zhipeng Xie	558
A New Visualization Method for Patent Map: Application to Ubiquitous Computing Technology Jong Hwan Suh, Sang Chan Park	566
Local Linear Logistic Discriminant Analysis with Partial Least Square Components Jangsun Baek, Young Sook Son	574
Activity Mining: Challenges and Prospects Longbing Cao	582
Finding the Optimal Cardinality Value for Information Bottleneck Method Gang Li, Dong Liu, Yiqing Tu, Yangdong Ye	594
A New Algorithm for Enumerating All Maximal Cliques in Complex Network Li Wan, Bin Wu, Nan Du, Qi Ye, Ping Chen	606
Modeling and Mining the Rule Evolution Ding Pan	618
Knowledge Reduction in Inconsistent Decision Tables Qihe Liu, Leiting Chen, Jianzhong Zhang, Fan Min	626
Text Mining	
Semantic Scoring Based on Small-World Phenomenon for Feature Selection in Text Mining Chong Huang, Yonghong Tian, Tiejun Huang, Wen Gao	636
A Comparative Study on Text Clustering Methods Yan Zheng, Xiaochun Cheng, Ronghuai Huang, Yi Man	644
Concept Based Text Classification Using Labeled and Unlabeled Data Ping Gu, Qingsheng Zhu, Xiping He	652
Learning Semantic User Profiles from Text M. Degemmis, P. Lops, G. Semeraro	661

Multimedia Mining

Audiovisual Integration for Racquet Sports Video Retrieval Yaqin Zhao, Xianzhong Zhou, Guizhong Tang	673
A Correlation Approach for Automatic Image Annotation David R. Hardoon, Craig Saunders, Sandor Szedmak, John Shawe-Taylor	681
Sequential Data Mining and Time Series Mining	
Fast Discovery of Time-Constrained Sequential Patterns Using Time-Indexes Ming-Yen Lin, Sue-Chen Hsueh, Chia-Wen Chang	693
Multi-dimensional Sequential Pattern Mining Based on Concept Lattice Yang Jin, Wanli Zuo	702
Mining Time-Delayed Coherent Patterns in Time Series Gene Expression Data Linjun Yin, Guoren Wang, Keming Mao, Yuhai Zhao	711
Mining Delay in Streaming Time Series of Industrial Process Haijie Gu, Gang Rong	723
Segmental Semi-Markov Model Based Online Series Pattern Detection Under Arbitrary Time Scaling Guangjie Ling, Yuntao Qian, Sen Jia	731
Diagnosis of Inverter Faults in PMSM DTC Drive Using Time-Series Data Mining Technique Dan Sun, Jun Meng, Zongyuan He	741
Applications of Data Mining Time Series to Power Systems Disturbance Analysis Jun Meng, Dan Sun, Zhiyong Li	749
Mining Compressed Sequential Patterns Lei Chang, Dongqing Yang, Shiwei Tang, Tengjiao Wang	761
Effective Feature Preprocessing for Time Series Forecasting Jun Hua Zhao, Zhao Yang Dong, Zhao Xu	769
On Similarity of Financial Data Series Based on Fractal Dimension Jian-rong Hou, Hui Zhao, Pei Huang	782

Web Mining

A Hierarchical Model of Web Graph Jie Han, Yong Yu, Chenxi Lin, Dingyi Han, Gui-Rong Xue	790
Web Scale Competitor Discovery Using Mutual Information Rui Li, Shenghua Bao, Jin Wang, Yuanjie Liu, Yong Yu	798
Biomedical Mining	
Co-expression Gene Discovery from Microarray for Integrative Systems Biology Yutao Ma, Yonghong Peng	809
Cardiovascular Disease Diagnosis Method by Emerging Patterns Heon Gyu Lee, Kiyong Noh, Bum Ju Lee, Ho-Sun Shon, Keun Ho Ryu	819
DNA Microarray Data Clustering by Hidden Markov Models and Bayesian Information Criterion Phasit Charoenkwan, Aompilai Manorat, Jeerayut Chaijaruwanich, Sukon Prasitwattanaseree, Sakarindr Bhumiratana	827
Application of Factor Analysis on Mycobacterium Tuberculosis Transcriptional Responses for Drug Clustering, Drug Target, and Pathway Detections Jeerayut Chaijaruwanich, Jamlong Khamphachua, Sukon Prasitwattanaseree, Saradee Warit, Prasit Palittapongarnpim	835
First Steps to an Audio Ontology-Based Classifier for Telemedicine Cong Phuong Nguyen, Ngoc Yen Pham, Eric Castelli	845
Obstacles and Misunderstandings Facing Medical Data Mining Ashkan Sami	856
SVM-Based Tumor Classification with Gene Expression Data Shulin Wang, Ji Wang, Huowang Chen, Boyun Zhang	864
GEPCLASS: A Classification Rule Discovery Tool Using Gene Expression Programming Wagner R. Weinert, Heitor S. Lopes	871

Advanced Applications

CBR-Based Knowledge Discovery on Results of Evolutionary Design of Logic Circuits Shuguang Zhao, Mingying Zhao, Jin Li, Change Wang	881
Data Summarization Approach to Relational Domain Learning Based on Frequent Pattern to Support the Development of Decision Making Rayner Alfred, Dimitar Kazakov	889
Extreme Value Dependence in Problems with a Changing Causation Structure Marlon Núñez, Rafael Morales	899
A Study on Object Recognition Technology Using PCA in the Variable Illumination Jong-Min Kim, Hwan-Seok Yang	911
Pattern Recurring in Three-Dimensional Graph Based on Data Mining Yanbing Liu, Menghao Wang	919
Mining the Useful Skyline Set Based on the Acceptable Difference Zhenhua Huang, Wei Wang	927
Modeling Information-Sharing Behaviors in BitTorrent System Based on Real Measurement Jinkang Jia, Changjia Chen	934
Financial Distress Prediction Based on Similarity Weighted Voting CBR Jie Sun, Xiao-Feng Hui	947
Customer Churn Prediction by Hybrid Model Jae Sik Lee, Jin Chun Lee	959
Base Vector Selection for Kernel Matching Pursuit Qing Li, Licheng Jiao	967
WaveSim Transform for Multi-channel Signal Data Mining Through Linear Regression PCA R. Pradeep Kumar, P. Nagabhushan	977
Research on Query-by-Committee Method of Active Learning and Application Yue Zhao, Ciwen Xu, Yongcun Cao	985
1 40 2.440, 0 40 11 4, 1 0 10 your 0 40	500

Traffic Management Genetic Algorithm Supporting Data Mining and QoS in Sensor Networks Yantao Pan, Wei Peng, Xicheng Lu
Comparison of Data Pre-processing in Pattern Recognition of Milk Powder Vis/NIR Spectra Haiyan Cen, Yidan Bao, Min Huang, Yong He
Semi-automatic Hot Event Detection Tingting He, Guozhong Qu, Siwei Li, Xinhui Tu, Yong Zhang, Han Ren
Security and Privacy Issues
Profile-Based Security Against Malicious Mobile Agents Hua Li, Glena Greene, Rafael Alonso
A Comprehensive Categorization of DDoS Attack and DDoS Defense Techniques Usman Tariq, ManPyo Hong, Kyung-suk Lhee
Structural Analysis and Mathematical Methods for Destabilizing Terrorist Networks Using Investigative Data Mining Nasrullah Memon, Henrik Legind Larsen
Alert Correlation Analysis in Intrusion Detection Moon Sun Shin, Kyeong Ja Jeong
Spatial Data Mining
OSDM: Optimized Shape Distribution Method Ashkan Sami, Ryoichi Nagatomi, Makoto Takahashi, Takeshi Tokuyama
View-Angle of Spatial Data Mining Shuliang Wang, Haning Yuan
Streaming Data Mining
Maintaining Moving Sums over Data Streams Tzu-Chiang Wu, Arbee L.P. Chen
MFIS—Mining Frequent Itemsets on Data Streams Zhi-jun Xie, Hong Chen, Cuiping Li

Table of Contents	XXI
am Classifiers by Mining	

Improving the Performance of Data Stream Classifiers by Mining
Recurring Contexts
Yong Wang, Zhanhuai Li, Yang Zhang, Longbo Zhang, Yun Jiang 1094
Author Index