# Table of Contents

## Complex Networks and Data Stream Mining

Community Detection by an Efficient Ant Colony Approach .......................... 1  
_Lúcio Pereira de Andrade, Rogério Pinto Espíndola, and Nelson Francisco Favilla Ebecken_

Adaptive XML Stream Classification Using Partial Tree-Edit Distance .......................... 10  
_Dariusz Brzezinski and Maciej Piernik_

RILL: Algorithm for Learning Rules from Streaming Data with Concept Drift .......................... 20  
_Magdalena Deckert and Jerzy Stefanowski_

Community Detection for Multiplex Social Networks Based on Relational Bayesian Networks .......................... 30  
_Jiuchuan Jiang and Manfred Jaeger_

Mining Dense Regions from Vehicular Mobility in Streaming Setting .......................... 40  
_Corrado Loglisci and Donato Malerba_

Mining Temporal Evolution of Entities in a Stream of Textual Documents .......................... 50  
_Gianvito Pio, Pasqua Fabiana Lanotte, Michelangelo Ceci, and Donato Malerba_

An Efficient Method for Community Detection Based on Formal Concept Analysis .......................... 61  
_Selmane Sid Ali, Fadila Bentayeb, Rokia Missaoui, and Omar Boussaid_

## Data Mining Methods

On Interpreting Three-Way Decisions through Two-Way Decisions .......................... 73  
_Xiaofei Deng, Yiyu Yao, and JingTao Yao_

FHM: Faster High-Utility Itemset Mining Using Estimated Utility Co-occurrence Pruning .......................... 83  
_Philippe Fournier-Viger, Cheng-Wei Wu, Souleymane Zida, and Vincent S. Tseng_

Automatic Subclasses Estimation for a Better Classification with HNNP .......................... 93  
_Ruth Janning, Carlotta Schatten, and Lars Schmidt-Thieme_
A Large-Scale, Hybrid Approach for Recommending Pages Based on Previous User Click Pattern and Content .......................... 103
Mohammad Amir Sharif and Vijay V. Raghavan

EverMiner Prototype Using LISp-Miner Control Language .......... 113
Milan Šimůnek and Jan Rauch

Local Characteristics of Minority Examples in Pre-processing of Imbalanced Data ......................................................... 123
Jerzy Stefanowski, Krystyna Napierała, and Małgorzata Trzcienińska

Visual-Based Detection of Properties of Confirmation Measures ....... 133
Robert Susmaga and Izabela Szczęch

Intelligent Systems Applications

A Recursive Algorithm for Building Renovation in Smart Cities ........ 144
Andrés Felipe Barco, Elise Vareilles, Michel Aldanondo, and Paul Gaborit

Spike Sorting Based upon PCA over DWT Frequency Band Selection ... 154
Konrad Ciecierski, Zbigniew W. Raś, and Andrzej W. Przybyszewski

Neural Network Implementation of a Mesoscale Meteorological Model ................................................................. 164
Robert Firth and Jianhua Chen

Spectral Machine Learning for Predicting Power Wheelchair Exercise Compliance ......................................................... 174
Robert Fisher, Reid Simmons, Cheng-Shiu Chung, Rory Cooper, Garrett Grindle, Annmarie Kelleher, Hsinyi Liu, and Yu Kuang Wu

Mood Tracking of Radio Station Broadcasts ............................ 184
Jacek Grekow

Evidential Combination Operators for Entrapment Prediction in Advanced Driver Assistance Systems .............................. 194
Alexander Karlsson, Anders Dahlbom, and Hui Zhong

Influence of Feature Sets on Precision, Recall, and Accuracy of Identification of Musical Instruments in Audio Recordings .......... 204
Elżbieta Kubera, Alicja A. Wieczorkowska, and Magdalena Skrzypiec

Multi-label Ferns for Efficient Recognition of Musical Instruments in Recordings ......................................................... 214
Miron B. Kursa and Alicja A. Wieczorkowska
Computer-Supported Polysensory Integration Technology for Educationally Handicapped Pupils .......................... 224
Michal Lech, Andrzej Czyzewski, Waldemar Kucharski, and Bozena Kostek

Integrating Cluster Analysis to the ARIMA Model for Forecasting Geosensor Data ........................................ 234
Sonja Pravilovic, Annalisa Appice, and Donato Malerba

Unsupervised and Hybrid Approaches for On-line RFID Localization with Mixed Context Knowledge .................. 244
Christoph Scholz, Martin Atzmueller, and Gerd Stumme

Mining Surgical Meta-actions Effects with Variable Diagnoses' Number ...................................................... 254
Hakim Touati, Zbigniew W. Raś, James Studnicki, and Alicja A. Wieczorkowska

Knowledge Representation in Databases and Systems

A System for Computing Conceptual Pathways in Bio-medical Text Models .................................................. 264
Troels Andreasen, Henrik Bulskov, Jørgen Fischer Nilsson, and Per Anker Jensen

Putting Instance Matching to the Test: Is Instance Matching Ready for Reliable Data Linking? ......................... 274
Silviu Homoceanu, Jan-Christoph Kalo, and Wolf-Tilo Balke

Improving Personalization and Contextualization of Queries to Knowledge Bases Using Spreading Activation and Users’ Feedback .... 285
Ana Belen Pelegrina, Maria J. Martin-Bautista, and Pamela Faber

Plethoric Answers to Fuzzy Queries: A Reduction Method Based on Query Mining ...................................... 295
Olivier Pivert and Grégory Smits

Generating Description Logic ALC from Text in Natural Language .......... 305
Ryan Ribeiro de Azevedo, Fred Freitas, Rodrigo Rocha, José António Alves de Menezes, and Luis F. Alves Pereira

DBaaS-Expert: A Recommender for the Selection of the Right Cloud Database ............................................. 315
Soror Sahri, Rim Moussa, Darrell D.E. Long, and Salima Benbernou

Context-Aware Decision Support in Dynamic Environments:
Methodology and Case Study ........................................ 325
Alexander Smirnov, Tatiana Levashova, Alexey Kashevnik, and Nikolay Shilov
Textual Data Analysis and Mining

Unsupervised Aggregation of Categories for Document Labelling ........ 335
  Piotr Borkowski, Krzysztof Ciesielski, and Mieczysław A. Klopotek

Classification of Small Datasets: Why Using Class-Based Weighting Measures? ................................. 345
  Flavien Bouillot, Pascal Poncelet, and Mathieu Roche

Improved Factorization of a Connectionist Language Model for Single-Pass Real-Time Speech Recognition ......................... 355
  Łukasz Brocki, Danijel Koržinek, and Krzysztof Marasek

Automatic Extraction of Logical Web Lists ................................ 365
  Pasqua Fabiana Lanotte, Fabio Fumarola, Michelangelo Ceci,
  Andrea Scarpino, Michele Damiano Torelli, and Donato Malerba

Combining Formal Logic and Machine Learning for Sentiment Analysis ...................................................... 375
  Niklas Christoffer Petersen and Jørgen Villadsen

Clustering View-Segmented Documents via Tensor Modeling ............ 385
  Salvatore Romeo, Andrea Tagarelli, and Dino Ienco

Searching XML Element Using Terms Propagation Method .......... 395
  Samia Berchiche-Fellag and Mohamed Mezghiche

Special Session: Challenges in Text Mining and Semantic Information Retrieval

AI Platform for Building University Research Knowledge Base ........ 405
  Jakub Koperwas, Łukasz Skonieczny, Marek Kozlowski,
  Piotr Andruszkiewicz, Henryk Rybiński, and Wacław Struk

A Seed Based Method for Dictionary Translation ........................ 415
  Robert Krajewski, Henryk Rybiński, and Marek Kozlowski

SAUText — A System for Analysis of Unstructured Textual Data ...... 425
  Grzegorz Protaziuk, Jacek Lewandowski, and Robert Bembensk

Evaluation of Path Based Methods for Conceptual Representation of the Text ............................................. 435
  Łukasz Kucharczyk and Julian Szymański
Special Session: Warehousing and OLAPing Complex, Spatial and Spatio-Temporal Data

Restructuring Dynamically Analytical Dashboards Based on Usage Profiles ......................................................... 445
Orlando Belo, Paulo Rodrigues, Rui Barros, and Helena Correia

Enhancing Traditional Data Warehousing Architectures with Real-Time Capabilities ............................................... 456
Alfredo Cuzzocrea, Nickerson Ferreira, and Pedro Furtado

Inference on Semantic Trajectory Data Warehouse Using an Ontological Approach ................................................... 466
Thouraya Sakouhi, Jalel Akaichi, Jamal Malki, Alain Bouju, and Rouaa Wannous

Combining Stream Processing Engines and Big Data Storages for Data Analysis ..................................................... 476
Thomas Steinmaurer, Patrick Traxler, Michael Zwick, Reinhard Stumptner, and Christian Lettner

ISMIS Posters

Representation and Evolution of User Profile in Information Retrieval Based on Bayesian Approach ........................ 486
Farida Achemoukh and Rachid Ahmed-Ouamer

Creating Polygon Models for Spatial Clusters ......................................................... 493
Fatih Akdag, Christoph F. Eick, and Guoning Chen

Skeleton Clustering by Autonomous Mobile Robots for Subtle Fall Risk Discovery ............................................... 500
Yutaka Deguchi and Einoshin Suzuki

Sonar Method of Distinguishing Objects Based on Reflected Signal Specifics ......................................................... 506
Teodora Dimitrova-Grekow and Marcin Jarczewski

Endowing Semantic Query Languages with Advanced Relaxation Capabilities ......................................................... 512
Géraud Fokou, Stéphane Jean, and Allel Hadjali

A Business Intelligence Solution for Monitoring Efficiency of Photovoltaic Power Plants .................................. 518
Fabio Fumarola, Annalisa Appice, and Donato Malerba
WBPL: An Open-Source Library for Predicting Web Surfing Behaviors .................................................. 524
   Ted Gueniche, Philippe Fournier-Viger, Roger Nkambou, and Vincent S. Tseng

Data-Quality-Aware Skyline Queries .................................................. 530
   Hélène Jaudoin, Olivier Pivert, Grégory Smits, and Virginie Thion

Neuroscience Rough Set Approach for Credit Analysis of Branchless Banking ........................................ 536
   Rory Lewis

Collective Inference for Handling Autocorrelation in Network Regression .............................................. 542
   Corrado Loglisci, Annalisa Appice, and Donato Malerba

On Predicting a Call Center’s Workload: A Discretization-Based Approach ........................................... 548
   Luis Moreira-Matias, Rafael Nunes, Michel Ferreira, João Mendes-Moreira, and João Gama

Improved Approximation Guarantee for Max Sum Diversification with Parameterised Triangle Inequality 554
   Marcin Sydow

Learning Diagnostic Diagrams in Transport-Based Data-Collection Systems ........................................... 560
   Vu The Tran, Peter Eklund, and Chris Cook

Author Index ................................................................. 567