# Table of Contents

## Preface

---

## Conference Committees and Reviewers

---

## Keynote Talks

---

## Session A: Data Acquisition, Cleansing and Categorization

- Improved Fine-Grained Component-Conditional Class Labeling with Active Learning
  - David J. Miller, Chu-Fang Lin, George Kesidis, and Christopher M. Collins

- A Novel Noise Filtering Algorithm for Imbalanced Data
  - Jason Van Hulse, Taghi M. Khoshgoftaar, and Amri Napolitano

- Dynamic Batch Size Selection for Batch Mode Active Learning in Biometrics
  - Shayok Chakraborty, Vineeth Balasubramanian, and Sethuraman Panchanathan

- A Study of Smoothing Algorithms for Item Categorization on e-Commerce Sites
  - Dan Shen, Jean-David Ruvini, Rajyashree Mukherjee, and Neel Sundaesran

## Session B: Planning and Reinforcement Learning

- From Serve-on-Demand to Serve-on-Need: A Game Theoretic Approach
  - Yong Lin and Fillia Makedon

- Autonomous Navigation in Dynamic Environments with Reinforcement Learning and Heuristic
  - Elizabeth Duane S. Costa and Maury M. Gouvea Jr.

- Public Goods Game Simulator with Reinforcement Learning Agents
  - ManChon U and Zhen Li

- MMM-PHC: A Particle-Based Multi-Agent Learning Algorithm
  - Philip R. Cook and Michael A. Goodrich
Session C: Supervised Learning

An All-at-once Unimodal SVM Approach for Ordinal Classification ................................................................. 59
Joaquim F. Pinto da Costa, Ricardo Sousa, and Jaime S. Cardoso

Centroid-based Classification Enhanced with Wikipedia ...................................................................................... 65
Abdullah Bawakid and Mourad Oussalah

Classification Models with Global Constraints for Ordinal Data ........................................................................... 71
Jaime S. Cardoso and Ricardo Sousa

Appearance Based Recognition Using Spatial and Discriminant Influence .................................................. 78
Qi Li and Chang-Tien Lu

Multi-Class Classification Using a New Sigmoid Loss Function for Minimum Classification Error (MCE) ...................................................................................................................... 84
Madhavi V. Ratnagiri, Lawrence Rabiner, and Biing–Hwang (Fred) Juang

Session D: Multi-party, Multi-modal, Multi-objective Learning

A Multimodel Approach of Complex Systems Identification and Control Using Neural and Fuzzy Clustering Algorithms ................................................................................................................................. 93
N. ElFelly, J.-Y. Dieulot, P. Borne, and M. Benrejeb

Learning Collaborative Behavior by Observation .................................................................................................. 99
Cynthia L. Johnson and Avelino J. Gonzalez

Heterogeneous Imitation Learning from Demonstrators of Varying Physiology and Skill .................................................. 105
Jeff Allen and John Anderson

Multimodal Parameter-exploring Policy Gradients ................................................................................................. 113
Frank Sehnke, Alex Graves, Christian Osendorfer, and Jürgen Schmidhuber

Discovering Knowledge Rules with Multi-Objective Evolutionary Computing ................................................. 119
Rafael Giusti and Gustavo E.A.P.A. Batista

Session E: Feature Selection

How Dependencies Affect the Capability of Several Feature Selection Approaches to Extract the Key Features ........................................................................................................................................ 127
Qin Yang and Robin Gras

A Comparative Study of Ensemble Feature Selection Techniques for Software Defect Prediction ......................... 135
Huanjing Wang, Taghi M. Khoshgoftaar, and Amri Napolitano

A New Approach to Classification with the Least Number of Features ................................................................... 141
Sascha Klement and Thomas Martinetz

Comparative Analysis of DNA Microarray Data through the Use of Feature Selection Techniques .................. 147
David J. Dittman, Taghi M. Khoshgoftaar, Randall Wald, and Jason Van Hulse
Session F: Probabilistic and Model Based Learning

A Probabilistic Graphical Model of Quantum Systems ................................................................. 155
Chen-Hsiang Yeang

Heuristic Method for Discriminative Structure Learning of Markov Logic Networks ..................... 163
Quang-Thang Dinh, Matthieu Exbrayat, and Christel Vrain

Learning Viewpoint Planning in Active Recognition on a Small Sampling Budget: A Kriging Approach ........................................................................................................................................ 169
Joseph Defretin, Julien Marzatz, and Hélène Piet-Lahanierz

Model-Based Co-clustering for Continuous Data ............................................................................ 175
Mohamed Nadif and Gérard Govaert

Session G: Similarity Learning for Pattern Recognition

Similarity Learning in Nearest Neighbor and Relief Algorithm .......................................................... 183
Ali Mustafa Qamar and Eric Gaussier

An Improved Co-Similarity Measure for Document Clustering ...................................................... 190
Syed Fawad Hussain, Gilles Bisson, and Clément Grimal

Multilayer Ferns: A Learning-based Approach of Patch Recognition and Homography
Extraction ................................................................................................................................................ 198
Gao Ce, Song Yixu, and Jia Peifa

A Binocular Framework for Face Liveness Verification under Unconstrained Localization ................. 204
Qi Li, Zhonghang Xia, and Guangming Xing

A Chunking Method for Euclidean Distance Matrix Calculation on Large Dataset
Using Multi-GPU ....................................................................................................................................... 208
Qi Li, Vojislav Kecman, and Raied Salman

Session H: Kernel Learning Methods

Modeling and Training Radial Basis Functions with Integrate-and-Fire Neurons .............................. 217
Richard Hudson, Jeremy Marvel, and Wyatt Newman

Multiple Kernel Learning by Conditional Entropy Minimization .................................................. 223
Hidetatsu Hino, Nima Reyhani, and Noboru Murata

Kernel-based Approaches for Collaborative Filtering .................................................................... 229
Zhonghang Xia, Wenke Zhang, Manghui Tu, and I-Ling Yen

Kernel Learning for Efficiency Maximization in the Conformal Predictions Framework ................. 235
Vineeth Balasubramanian, Shayok Chakraborty, Sethuraman Panchanathan, and Jieping Ye

Validating Meronymy Hypotheses with Support Vector Machines and Graph Kernels ..................... 243
Tim vor der Brück and Hermann Helbig
Session I: Unsupervised Learning

Improved Unsupervised Clustering over Watershed-Based Clustering ................................................................. 253
   Sai Venu Gopal Lolla and Lawrence L. Hoberock

Pairwise Constrained Clustering with Group Similarity-Based Patterns ............................................................. 260
   Tianming Hu, Chuanren Liu, Jing Sun, Sam Yuan Sung, and Peter A. Ng

Parallel Projections for Manifold Learning ........................................................................................................... 266
   Harry Strange and Reyer Zwiggelaar

Learning from Multiple Related Data Streams with Asynchronous Flowing Speeds ........................................... 272
   Zhi Qiao, Peng Zhang, Jing He, Jinghua Yan, and Li Guo

Session J: Machine Learning in Bioinformatics and Computational Biology

Identification of Transcriptional Regulatory Networks by Learning the Marginal Function of Outlier Sum Statistic ................................................................. 281
   Jinghua Gu, Jianhua Xuan, Yue Wang, Rebecca B. Riggins, and Robert Clarke

Computational Analysis of Muscular Dystrophy Sub-types Using a Novel Integrative Scheme ................................................................. 287
   Chen Wang, Sook Ha, Yue Wang, Jianhua Xuan, and Eric Hoffman

A Classification Approach for Risk Prognosis of Patients on Mechanical Ventricular Assistance ................................................................. 293
   Yajuan Wang, Carolyn Penstein Rosé, Antonio Ferreira, Dennis M. McNamara,
   Robert L. Kormos, and James F. Antaki

Neuropathic Pain Scale Based Clustering for Subgroup Analysis in Pain Medicine ........................................... 299
   Guangzhi Qu, Hui Wu, Ishwar Sethi, and Craig T. Hartrick

Session K: Machine Learning and Parallel Computing

Parallel Training of a Back-Propagation Neural Network Using CUDA .................................................................. 307
   Xavier Sierra-Canto, Francisco Madera-Ramirez, and Victor Uc-Cetina

Support Vector Machines on GPU with Sparse Matrix Format ........................................................................ 313
   Tsung-Kai Lin and Shao-Yi Chien

Space Partitioning for Scalable K-Means ................................................................................................................. 319
   David Pettinger and Giuseppe Di Fatta

Speeding Up Greedy Forward Selection for Regularized Least-Squares ............................................................... 325
   Tapio Pahikkala, Antti Airola, and Tapio Salakoski

Session L: Applications I

Clustering High-frequency Stock Data for Trading Volatility Analysis ................................................................. 333
   Xiao-Wei Ai, Tianming Hu, Xi Li, and Hui Xiong

Plant Species Classification Using a 3D LIDAR Sensor and Machine Learning .................................................... 339
   Ulrich Weiss, Peter Biber, Stefan Laible, Karsten Bohlmann, and Andreas Zell
Generalized Data Field and its Application for Facial Expression Recognition ........................................346
        Shuliang Wang, Ying Li, Yuan Xie, and Hanning Yuan

Detecting Quasars in Large-Scale Astronomical Surveys ......................................................................352
        Fabian Gieseke, Kai Lars Polsterer, Andreas Thom, Peter Zinn, Dominik Bomanns,
        Ralf-Jürgen Dettmar, Oliver Kramer, and Jan Vahrenhold

Session M: Ensemble Learning

Boosted Dynamic Cognitive Activity Recognition from Brain Images .....................................................361
        Jun Li and Dacheng Tao

Boosting Multi-Task Weak Learners with Applications to Textual and Social Data ......................................367
        Jean Baptiste Faddoul, Boris Chidlovskii, Fabien Torre, and Remi Gilleron

The Upper and Lower Bounds of the Prediction Accuracies of Ensemble Methods
for Binary Classification ..........................................................................................................................373
        Xueyi Wang and Nicholas J. Davidson

Evolutionary Selection of Regressional Predictors to Enhance the Performance
of Microfossil-Based Paleotemperature Proxies ......................................................................................379
        Amin Assareh, L. Gwenn Volkert, and Joseph D. Ortiz

Session N: Reinforcement Learning

Decentralized and Partially Decentralized Reinforcement Learning for Distributed
Combinatorial Optimization Problems ...................................................................................................389
        Omkar Tilak and Snehasis Mukhopadhyay

Multi-Agent Inverse Reinforcement Learning ..........................................................................................395
        Sriraam Natarajan, Gautam Kunapuli, Kshitij Judah, Prasad Tadepalli, Kristian Kersting,
        and Jude Shavlik

Ensembles of Neural Networks for Robust Reinforcement Learning .......................................................401
        Alexander Hans and Steffen Udluft

Enhancing Inference in Relational Reinforcement Learning Via Truth Maintenance
Systems .........................................................................................................................................................407
        Mandana Hamidi, Amir Fijany, and Jean-Guy Fontaine

Section O: Bayesian Learning

Learning Bayesian Networks for Improved Instruction Cache Analysis ................................................417
        Mark Bartlett, Iain Bate, and James Cussens

Bayesian Classification of Flight Calls with a Novel Dynamic Time Warping Kernel ................................424
        Theodoros Damoulas, Samuel Henry, Andrew Farnsworth, Michael Lanzone, and Carla Gomes

Evolutionary Algorithm Using Random Multi-point Crossover Operator for Learning
Bayesian Network Structures ....................................................................................................................430
        Edimilson B. dos Santos, Estevam R. Hruschka Jr., and Nelson F.F. Ebecken

Semi-Supervised Anomaly Detection for EEG Waveforms Using Deep Belief Nets ................................436
        Drausin Wulsin, Justin Blanco, Ram Mani, and Brian Litt
Session P: Online and Incremental Learning

Incremental kNN Classifier Exploiting Correct-Error Teacher for Activity Recognition .................................................. 445
Kilian Förster, Samuel Monteleone, Alberto Calatroni, Daniel Roggen, and Gerhard Tröster

Incremental Learning of Relational Action Rules ........................................................................................................... 451
Christophe Rodrigues, Pierre Gérard, Céline Rouveirol, and Henry Soldano

On-Line Adaptation of Exploration in the One-Armed Bandit with Covariates Problem ..................................................... 459
Adam M. Sykulski, Niall M. Adams, and Nicholas R. Jennings

On-line, Incremental Learning for Real-Time Vision Based Movement Recognition .......................................................... 465
Anuraag Sridhar, Arcot Sowmya, and Paul Compton

Special Session Q: Machine Learning Methods for Biomedical Literature Analysis and Text Retrieval

Building a Biomedical Tokenizer Using the Token Lattice Design Pattern and the Adapted Viterbi Algorithm .......................................................... 473
Neil Barrett and Jens Weber-Jahnke

A Structural SVM Approach for Reference Parsing .............................................................................................................. 479
Xiaoli Zhang, Jie Zou, Daniel X. Le, and George R. Thoma

A System for De-identifying Medical Message Board Text ........................................................................................................... 485
Adrian Benton, Shawndra Hill, Lyle Ungar, Annie Chung, Charles Leonard, Cristin Freeman, and John H. Holmes

Improving a Gold Standard: Treating Human Relevance Judgments of MEDLINE Document Pairs .......................................................... 491
Won Kim and W. John Wilbur

Identifying Abbreviation Definitions Machine Learning with Naturally Labeled Data ............................................................. 499
Lana Yeganova, Donald C. Comeau, and W. John Wilbur

Special Session R: Machine Learning in Bioinformatics and Computational Biology

A Parallel Algorithm for Predicting the Secondary Structure of Polycistronic MicroRNAs ........................................................................................................... 509
Dianwei Han, Guiliang Tang, and Jun Zhang

A Heuristic Algorithm for Finding the Longest Pathways in a Biochemical Network .............................................................. 515
Chunmei Liu, Hui Li, Alison Leonce, Legand Burge, John Trimble, Peter Keiller, and Abdul-Aziz Yakubu

Using Randomised Vectors in Transcription Factor Binding Site Predictions .............................................................................. 523
Faisal Rezwan, Yi Sun, Neil Davey, Rod Adams, Alistair G. Rust, and Mark Robinson

Automatic Detection of HIV Drug Resistance-Associated Mutations ...................................................................................... 528
Betty Y. Cheng and Jaime G. Carbonell

Selection of Classifier and Feature Selection Method for Microarray Data .............................................................................. 534
Boseon Byeon and Khaled Rasheed
Smoothing Gene Expression Using Biological Networks ................................................................. 540
Yue Fan, Mark Kon, Shinuk Kim, and Charles DeLisi

Non-Alignment Features Based Enzyme/Non-Enzyme Classification Using an Ensemble Method ................................................................. 546
Nicholas J. Davidson and Xueyi Wang

Special Session T: Dynamic Learning in Non-Stationary Environments
Learning in Dynamic Environments: Application to the Identification of Hybrid Dynamic Systems .................................................................................. 555
Moamar Sayed Mouchaweh

Incremental Nyström Low-Rank Decomposition for Dynamic Learning ........................................ 561
Lin Zhang and Hongyu Li

Dynamic Decision Method Based on Contextual Selection of Representation Subspaces ............................................................. 567
Pierre Beauseroy, André Smolarz, Yuan Dong, and Xiyan He

On Dynamic Selection of the Most Informative Samples in Classification Problems ......................... 573
Edwin Lughofer

A Hybrid Multi-classifier to Characterize and Interpret Hemiparetic Patients Gait Coordination .............................................................. 580
Laurent Hartert and Moamar Sayed Mouchaweh

Improving Premise Structure in Evolving Takagi-Sugeno Neuro-Fuzzy Classifiers .......................... 586
Abdullah Almaksour and Eric Anquetil

Special Session U: Autonomous Machine Learning
Learning to Be a Good Tour-Guide Robot .......................................................................................... 595
J. Javier Rainer and Ramón Galán

Self-Optimizing a Clustering-based Tag Recommender for Social Bookmarking Systems ................ 601
Malik Tahir Hassan, Asim Karim, Fahad Javed, and Naveed Arshad

Autonomous Clustering Characterization for Categorical Data ....................................................... 607
Nistor Grozavu, Lazhar Labiod, and Younès Bennani

Special Session V: Business Intelligent Applications and Technologies
Extreme Volume Detection for Managed Print Services ................................................................... 617
John C. Handley, Marie-Luise Schneider, Victor Ciriza, and Jeffrey Earl

Predicting Remaining Useful Life Based on the Failure Time Data with Heavy-Tailed Behavior and User Usage Patterns Using Proportional Hazards Model ......................................................... 623
Zhiguo Li and Gregory Kott

Semi-Automatic WordNet Based Emotion Dictionary Construction ................................................ 629
David B. Bracewell
Intelligent Classification System Using a Pruned Bayes Fuzzy Rule Set ..............................................................635
  I-Hsien Yin, Estevam R. Hruschka Jr., and Heloisa de A. Camargo

Special Session W: Machine Learning with Multimedia Data

Interestingness Detection in Sports Audio Broadcasts .................................................................643
  Sam Davies and Denise Bland

Feature Selection in Clustering with Constraints: Application to Active Exploration
of Music Collections ..................................................................................................................649
  Pedro Mercado and Hanna Lukashevich

Prediction of Time-Varying Musical Mood Distributions Using Kalman Filtering ...................655
  Erik M. Schmidt and Youngmoo E. Kim

Multi-view Clustering of Visual Words Using Canonical Correlation Analysis
for Human Action Recognition ................................................................................................661
  Behrouz Saghafi and Deepu Rajan

Special Session X: Machine Learning in Energy Applications (I)

Energy Production and Economic Growth: A Causality Analysis for Turkey Based
on Computer .............................................................................................................................669
  Omer Ozkan, Muharrem Aktaş, Huseyin Serdar Kuyuk, and Serkan Bayraktaroğlu

Control of Doubly-Fed Induction Generator System Using PIDNNs ...........................................675
  Faa-Jeng Lin, Jonq-Chin Hwang, Kuang-Hsiung Tan, Zong-Han Lu, and Yung-Ruei Chang

Modelling Turkey’s Energy Consumption Based on Artificial Neural Network .........................681
  Huseyin Serdar Kuyuk, Ömer Özkan, Ramazan Kayikci, and Serkan Bayraktaroğlu

Wind Speed Forecasting Based on Second Order Blind Identification
and Autoregressive Model .........................................................................................................686
  Umut Firat, Seref Naci Engin, Murat Saraclar, and Aysin Baytan Ertuzun

DC Bus Voltage Regulation of an Active Power Filter Using a Fuzzy Logic Controller ..............692
  Ilhami Colak, Ramazan Bayindir, Orhan Kaplan, and Ferhat Tas

Special Session Y: Machine Learning in Energy Applications (II)

Hardware Implementation of a Real-Time Neural Network Controller Set for Reactive
Power Compensation Systems ..................................................................................................699
  Ramazan Bayindir and Alper Gorgun

The Personal Assessment Tool: A System Providing Environmental Feedback to Users
of Shared Printers for Providing Environmental Feedback ....................................................704
  Antonietta Grasso, Jutta Willamowski, Victor Ciriza, and Yves Hoppenot

Determination of Vocational Fields with Machine Learning Algorithm ....................................710
  Halil Ibrahim Bulbul and Özkan Ünsal
Determining Suitability of Locations for Installation of Solar Power Station Based on Probabilistic Inference ................................................................. 714
  Ilhami Colak, Seref Sagiroglu, Mehmet Demirtas, and Hamdi Tolga Kahraman

A New Prediction Based Digital Control DC-DC Converter ........................................ 720
  Fujio Kurokawa, Hidenori Maruta, Junya Sakemi, Akihiro Nakamura, and Hiroyuki Osuga

Modeling Occupancy Behavior for Energy Efficiency and Occupants Comfort Management in Intelligent Buildings .................................................. 726
  Tina Yu

**Special Session Z: Machine Learning Methods in Cancer and Radiation Therapy**

Predicting Local Failure in Lung Cancer Using Bayesian Networks ............................ 735
  Jung Hun Oh, Jeffrey Craft, Rawan Al-Lozi, Manushka Vaidya, Yifan Meng, Joseph O. Deasy, Jeffrey D. Bradley, and Issam El Naqa

Using a Bayesian Feature-selection Algorithm to Identify Dose-response Models Based on the Shape of the 3D Dose-distribution: An Example from a Head-and-neck Cancer Trial ................................................................. 740
  Florian Buettner, Sarah L. Gulliford, Steve Webb, Mike Partridge, Aisha B. Miah, Kevin J. Harrington, and Christopher M. Nutting

Using an Infinite Von Mises-Fisher Mixture Model to Cluster Treatment Beam Directions in External Radiation Therapy ............................................. 746
  Mark Bangert, Philipp Hennig, and Uwe Oelfke

Automatic Segmentation of the Prostate Using a Genetic Algorithm for Prostate Cancer Treatment Planning .............................................................. 752
  Melanie Mitchell, James A. Tanyi, and Arthur Y. Hung

A Novel Application of Principal Surfaces to Segmentation in 4D-CT for Radiation Treatment Planning ................................................................. 758
  Sheng You, Esra Ataer-Cansizoglu, Deniz Erdogmus, James Tanyi, and Jayashree Kalpathy-Cramer

**Poster Session**

Bayesian Inferences and Forecasting in Spatial Time Series Models .......................... 767
  Sung Duck Lee and Duck-Ki Kim

Consensus Feature Ranking in Datasets with Missing Values .................................... 771
  Shobeir Fakhraei, Hamid Soltanian-Zadeh, Farshad Fotouhi, and Kost Elisevich

Hybridization of Base Classifiers of Random Subsample Ensembles for Enhanced Performance in High Dimensional Feature Spaces ................................. 776
  Santhosh Pathical and Gursel Serpen

Patient-Specific Seizure Detection from Intra-cranial EEG Using High Dimensional Clustering .................................................................................... 782
  Haimonti Dutta, David Waltz, Karthik M. Ramasamy, Phil Gross, Ansaf Salleb-Aouissi, Hatim Diab, Manoj Pooleery, Catherine A. Schevon, and Ronald Emerson

xiii
Aggregating Multiple Biological Measurements Per Patient ................................................................. 788
Valentina Bayer Zubek and Faisal M. Khan

Empowering Simultaneous Feature and Instance Selection in Classification Problems
through the Adaptation of Two Selection Algorithms ........................................................................... 793
Rafael Augusto Ferreira do Carmo, Fabricio Gomes de Freitas, and Jerffeson Teixeira de Souza

Feature Transformation and Model Design Using Minimum Classification Error ................................ 797
Madhavi Vedula Ratnagiri, Lawrence Rabiner, and Biing-Hwang (Fred) Juang

On the Scalability of Supervised Learners in Metagenomics ............................................................... 803
ManChon U, Vasim Mahamuda, and Khaled Rasheed

On Estimation of Quantiles for Pairwise Distances .............................................................................. 808
Sai Venu Gopal Lolla and Lawrence L. Hoberock

Overcoming Alpha-Beta Limitations Using Evolved Artificial Neural Networks .................................. 813
Yarin Gal and Mireille Avigal

A Comparison of Techniques for Handling Incomplete Input Data with a Focus
on Attribute Relevance Influence ........................................................................................................ 819
M. Millán Giraldo, J.S. Sánchez, and V.J. Traver

Effective Virtual Machine Monitor Intrusion Detection Using Feature Selection
on Highly Imbalanced Data .................................................................................................................... 823
Malak Alshawabkeh, Micha Moffie, Fatemeh Azmandian, Javed A. Aslam, Jennifer Dy, and David Kaeli

Pre-Processing Structured Data for Standard Machine Learning Algorithms
by Supervised Graph Propositionalization - A Case Study with Medicinal Chemistry
Datasets .................................................................................................................................................. 828
Thashmee Karunaratne, Henrik Boström, and Ulf Norinder

Novel Approach for Test Methods Automatic Selection in Product Reliability:
Improved Method for Acquiring Part-Whole Relation ......................................................................... 834
Nobuyuki Ohmori and Tatsunori Mori

System Identification with Multi-Agent-based Evolutionary Computation Using
a Local Optimization Kernel .................................................................................................................. 840
Sebastian Bohlmann, Volkhard Klinger, and Helena Szczerbicka

Power Iteration Denoising .................................................................................................................. 846
Panganai Gomo and Mike Spann

Combining Rule Induction and Reinforcement Learning: An Agent-based Vehicle
Routing .................................................................................................................................................. 851
Bartlomiej Sniezynski, Wojciech Wójcik, Jan D. Gehrke, and Janusz Wojtusiak

Domain Adaptation in Sentiment Classification .................................................................................... 857
Diego Uribe

The Influence Machine: Nonnegative Instance-Space Learning with Differentiated
Regularization ........................................................................................................................................ 861
Jian Zhang
Nonlinear Dynamical Multi-Scale Model of Associative Memory .............................................................. 867
Alexander M. Duda and Stephen E. Levinson

Map-TreeMaps: A New Approach for Hierarchical and Topological Clustering ........................................... 873
Hanene Azzag, Mustapha Lebbah, and Aymen Arfaoui

A Comparison of Linear Support Vector Machine Algorithms on Large Non-Sparse Datasets .............................................................. 879
Alina Lazar

Deep Spatiotemporal Feature Learning with Application to Image Classification ........................................... 883
Thomas P. Karnowski, Itamar Arel, and Derek Rose

Learning Gene Regulatory Networks with Predefined Attractors for Sequential Updating Schemes Using Simulated Annealing .................................................... 889
Gonzalo A. Ruz and Eric Goles

Neuro-Fuzzy Function Approximations Using Feedforward Networks - An Application of Sigmoidal Signal ........................................................................................................... 895
V. Suresh Kumar, S. Vijaya Chandra, and C. Susil Kumar

Boolean Factor Analysis for Data Preprocessing in Machine Learning .......................................................... 899
Jan Outrata

Classification of Live Moths Combining Texture, Color and Shape Primitives .................................................. 903
Gustavo E.A.P.A. Batista, Bilson Campana, and Eamonn Keogh

Unsupervised and Online Update of Boosted Temporal Models: The UAL2Boost ......................................... 907
Pedro Canotilho Ribeiro, Plinio Moreno, and José Santos-Victor

Discovering and Characterizing Hidden Variables in Streaming Multivariate Time Series .......................................................... 913
Soumi Ray and Tim Oates

Predicting End-to-end Network Load .............................................................................................................. 917
Akshay Vashist, Siun-Chuon Mau, Alexander Poylisher, Ritu Chadha, and Abhrajit Ghosh

Pre-image Problem in Manifold Learning and Dimensional Reduction Methods ........................................... 921
Omar Arif, Patricio Vela, and Wayne Daley

Spatial Based Feature Generation for Machine Learning Based Optimization Compilation .......................................................... 925
Abid M. Malik

Variable Selection: A Statistical Dependence Perspective .............................................................................. 931
Sohan Seth and José C. Príncipe

An Optimal Regression Algorithm for Piecewise Functions Expressed as Object-Oriented Programs .................. 937
Juan Luo and Alexander Brodsky

Robust Learning for Adaptive Programs by Leveraging Program Structure .................................................. 943
Jervis Pinto, Alan Fern, Tim Bauer, and Martin Erwig

A Relative Tendency Based Stock Market Prediction System ........................................................................ 949
ManChon U and Khaled Rasheed
Constrained Nonnegative Tensor Factorization for Clustering .................................................................954

Wei Peng

Automatic Synonym and Phrase Replacement Show Promise for Style Transformation ............................................958

Foaad Khosmood and Robert Levinson

Posters from Special Sessions

Query Expansion for UMLS Metathesaurus Disambiguation Based on Automatic Corpus Extraction .................................................................965

Antonio Jimeno Yepes and Alan R. Aronson

A Bayesian Nonparametric Model for Joint Relation Integration and Domain Clustering ..........................................................969

Dazhuo Li, Fahim Mohammad, and Eric Rouchka

Discovering and Counting Biomedical Verbs .................................................................................................975

Sonjia Waxmonsky, John Goldsmith, and Andrey Rzhetsky

Peptide Sequence Tag-Based Blind Identification-based SVM Model ........................................................................979

Hui Li, Chunmei Liu, Xumin Liu, Macire Diakite, Legand Burge, Abdul-Aziz Yakubu, and William Southerland

A Framework for Comprehensive Electronic QA in Radiation Therapy .................................................................985

J. Kildea, M. Evans, and W. Parker

Applying Permutation Tests for Assessing the Statistical Significance of Wrapper Based Feature Selection ...........................................................................989

Antti Airola, Tapio Pahikkala, Jorma Boberg, and Tapio Salakoski

A Textual Representation Scheme for Identifying Clinical Relationships in Patient Records ..................................................................................995

Rezarta Islamaj Doan, Aurélie Névéol, and Zhiyong Lu

The Design and Application of the Public Booking Service System ........................................................................999

Liu Dan and Yue KaiDuan

ICMLA Challenge Posters

Unsupervised Speaker Clustering in a Linear Discriminant Subspace ........................................................................1005

Theodoros Giannakopoulos and Sergios Petridis

Speaker Clustering Using Trails in Feature Space ...............................................................................................1010

Ondej Sýkora

Sequential Data Clustering ........................................................................................................................................1015

Jianfei Wu, Loai Al Nimer, Omar Al Azzam, Charith Chitraranjan, Saeed Salem, and Anne M. Denton

Author Index ........................................................................................................................................................1021