

# **33rd AAI Conference on Artificial Intelligence (AAAI-19)**

## **Volume 6: AAI Technical Track**

- Machine Learning (continued)

Honolulu, Hawaii, USA  
27 January – 1 February 2019

Part 1 of 2

ISBN: 978-1-7138-2854-9

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2019) by Association for the Advancement of Artificial Intelligence  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact Association for the Advancement of Artificial Intelligence  
at the address below.

Association for the Advancement of Artificial Intelligence  
2275 East Bayshore Road  
Suite 160  
Palo Alto, California 94303  
USA

Phone: 1-650-328-3123  
Fax: 1-650-321-4457

<https://aaai.org/Press/press.php>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## PART 1

### AAAI TECHNICAL TRACK: MACHINE LEARNING (CONTINUED)

STATE-AUGMENTATION TRANSFORMATIONS FOR RISK-SENSITIVE REINFORCEMENT LEARNING .....	4512
<i>Shuai Ma, Jia Yuan Yu</i>	
LABELFOREST: NON-PARAMETRIC SEMI-SUPERVISED LEARNING FOR ACTIVITY RECOGNITION.....	4520
<i>Yuchao Ma, Hassan Ghasemzadeh</i>	
COMPLEX UNITARY RECURRENT NEURAL NETWORKS USING SCALED CAYLEY TRANSFORM.....	4528
<i>Kehelwala D. G. Maduranga, Kyle E. Helfrich, Qiang Ye</i>	
THE CURSE OF CONCENTRATION IN ROBUST LEARNING: EVASION AND POISONING ATTACKS FROM CONCENTRATION OF MEASURE.....	4536
<i>Saeed Mahloujifar, Dimitrios I. Diochnos, Mohammad Mahmoody</i>	
A DISTILLATION APPROACH TO DATA EFFICIENT INDIVIDUAL TREATMENT EFFECT ESTIMATION.....	4544
<i>Maggie Makar, Adith Swaminathan, Emre Kiciman</i>	
DYS: A FRAMEWORK FOR MIXTURE MODELS IN QUANTIFICATION .....	4552
<i>André Maletzke, Denis Dos Reis, Everton Cherman, Gustavo Batista</i>	
TOWARDS BETTER INTERPRETABILITY IN DEEP Q-NETWORKS.....	4561
<i>Raghuram Mandyam Annasamy, Katia Sycara</i>	
COST-SENSITIVE LEARNING TO RANK .....	4570
<i>Ryan McBride, Ke Wang, Zhouyang Ren, Wenyuan Li</i>	
A TWO-STREAM MUTUAL ATTENTION NETWORK FOR SEMI-SUPERVISED BIOMEDICAL SEGMENTATION WITH NOISY LABELS .....	4578
<i>Shaobo Min, Xuejin Chen, Zheng-Jun Zha, Feng Wu, Yongdong Zhang</i>	
A PROBABILISTIC DERIVATION OF LASSO AND L12-NORM FEATURE SELECTIONS .....	4586
<i>Di Ming, Chris Ding, Feiping Nie</i>	
COGRA: CONCEPT-DRIFT-AWARE STOCHASTIC GRADIENT DESCENT FOR TIME-SERIES FORECASTING .....	4594
<i>Kohei Miyaguchi, Hiroshi Kajino</i>	
WEISFEILER AND LEMAN GO NEURAL: HIGHER-ORDER GRAPH NEURAL NETWORKS.....	4602
<i>Christopher Morris, Martin Ritzert, Matthias Fey, William L. Hamilton, Jan Eric Lenssen, Gaurav Rattan, Martin Grohe</i>	
CLUSTERGAN: LATENT SPACE CLUSTERING IN GENERATIVE ADVERSARIAL NETWORKS.....	4610
<i>Sudipto Mukherjee, Himanshu Asnani, Eugene Lin, Sreeram Kannan</i>	

SUBSPACE SELECTION VIA DR-SUBMODULAR MAXIMIZATION ON LATTICES.....	4618
<i>So Nakashima, Takanori Maehara</i>	
NUMBER SEQUENCE PREDICTION PROBLEMS FOR EVALUATING COMPUTATIONAL POWERS OF NEURAL NETWORKS.....	4626
<i>Hyounghwook Nam, Segwang Kim, Kyomin Jung</i>	
EFFICIENT COUNTERFACTUAL LEARNING FROM BANDIT FEEDBACK.....	4634
<i>Yusuke Narita, Shota Yasui, Kohei Yata</i>	
MULTIGRID BACKPROJECTION SUPER-RESOLUTION AND DEEP FILTER VISUALIZATION.....	4642
<i>Pablo Navarrete Michelini, Hanwen Liu, Dan Zhu</i>	
BIOLOGICALLY MOTIVATED ALGORITHMS FOR PROPAGATING LOCAL TARGET REPRESENTATIONS.....	4651
<i>Alexander G. Ororbia, Ankur Mali</i>	
DETERMINANTAL REINFORCEMENT LEARNING.....	4659
<i>Takayuki Osogami, Rudy Raymond</i>	
NON-PARAMETRIC TRANSFORMATION NETWORKS FOR LEARNING GENERAL INVARIANCES FROM DATA.....	4667
<i>Dipan K. Pal, Marios Savvides</i>	
POLICY OPTIMIZATION WITH MODEL-BASED EXPLORATIONS.....	4675
<i>Feiyang Pan, Qingpeng Cai, An-Xiang Zeng, Chun-Xiang Pan, Qing Da, Hualin He, Qing He, Pingzhong Tang</i>	
COMPRESSING RECURRENT NEURAL NETWORKS WITH TENSOR RING FOR ACTION RECOGNITION.....	4683
<i>Yu Pan, Jing Xu, Maolin Wang, Jinmian Ye, Fei Wang, Kun Bai, Zenglin Xu</i>	
ON REINFORCEMENT LEARNING FOR FULL-LENGTH GAME OF STARCRAFT.....	4691
<i>Zhen-Jia Pang, Ruo-Ze Liu, Zhou-Yu Meng, Yi Zhang, Yang Yu, Tong Lu</i>	
ADVERSARIAL DROPOUT FOR RECURRENT NEURAL NETWORKS.....	4699
<i>Sungrae Park, Kyungwoo Song, Mingi Ji, Wonsung Lee, Il-Chul Moon</i>	
TRAINABLE UNDERSAMPLING FOR CLASS-IMBALANCE LEARNING.....	4707
<i>Minlong Peng, Qi Zhang, Xiaoyu Xing, Tao Gui, Xuanjing Huang, Yu-Gang Jiang, Keyu Ding, Zhigang Chen</i>	
EXPLOITING SYNTHETICALLY GENERATED DATA WITH SEMI-SUPERVISED LEARNING FOR SMALL AND IMBALANCED DATASETS.....	4715
<i>M. Pérez-Ortiz, P. Tino, R. Mantiuk, C. Hervás-Martínez</i>	
INTERPRETABLE PREFERENCE LEARNING: A GAME THEORETIC FRAMEWORK FOR LARGE MARGIN ON-LINE FEATURE AND RULE LEARNING.....	4723
<i>Mirko Polato, Fabio Aiolli</i>	
LEARNING TO SOLVE NP-COMPLETE PROBLEMS: A GRAPH NEURAL NETWORK FOR DECISION TSP.....	4731
<i>Marcelo Prates, Pedro H. C. Avelar, Henrique Lemos, Luis C. Lamb, Moshe Y. Vardi</i>	
ROBUST OPTIMIZATION OVER MULTIPLE DOMAINS.....	4739
<i>Qi Qian, Shenghuo Zhu, Jiasheng Tang, Rong Jin, Baigui Sun, Hao Li</i>	

COMPOSITE BINARY DECOMPOSITION NETWORKS.....	4747
<i>You Qiaoben, Zheng Wang, Jianguo Li, Yinpeng Dong, Yu-Gang Jiang, Jun Zhu</i>	
NEAREST-NEIGHBOUR-INDUCED ISOLATION SIMILARITY AND ITS IMPACT ON DENSITY-BASED CLUSTERING.....	4755
<i>Xiaoyu Qin, Kai Ming Ting, Ye Zhu, Vincent Cs Lee</i>	
TRAINING COMPLEX MODELS WITH MULTI-TASK WEAK SUPERVISION .....	4763
<i>Alexander Ratner, Braden Hancock, Jared Dunnmon, Frederic Sala, Shreyash Pandey, Christopher Ré</i>	
EXPLICITLY IMPOSING CONSTRAINTS IN DEEP NETWORKS VIA CONDITIONAL GRADIENTS GIVES IMPROVED GENERALIZATION AND FASTER CONVERGENCE .....	4772
<i>Sathya N. Ravi, Tuan Dinh, Vishnu Suresh Lokhande, Vikas Singh</i>	
REGULARIZED EVOLUTION FOR IMAGE CLASSIFIER ARCHITECTURE SEARCH .....	4780
<i>Esteban Real, Alok Aggarwal, Yanping Huang, Quoc V. Le</i>	
ON FAIR COST SHARING GAMES IN MACHINE LEARNING .....	4790
<i>Ievgen Redko, Charlotte Laclau</i>	
DEEP RECURRENT SURVIVAL ANALYSIS.....	4798
<i>Kan Ren, Jiarui Qin, Lei Zheng, Zhengyu Yang, Weinan Zhang, Lin Qiu, Yong Yu</i>	
REPEATNET: A REPEAT AWARE NEURAL RECOMMENDATION MACHINE FOR SESSION-BASED RECOMMENDATION .....	4806
<i>Pengjie Ren, Zhumin Chen, Jing Li, Zhaochun Ren, Jun Ma, Maarten De Rijke</i>	
DEVIL IN THE DETAILS: TOWARDS ACCURATE SINGLE AND MULTIPLE HUMAN PARSING.....	4814
<i>Tao Ruan, Ting Liu, Zilong Huang, Yunchao Wei, Shikui Wei, Yao Zhao</i>	
LATENT MULTI-TASK ARCHITECTURE LEARNING.....	4822
<i>Sebastian Ruder, Joachim Bingel, Isabelle Augenstein, Anders Søgaard</i>	
HOW MANY PAIRWISE PREFERENCES DO WE NEED TO RANK A GRAPH CONSISTENTLY? .....	4830
<i>Aadirupa Saha, Rakesh Shivanna, Chiranjib Bhattacharyya</i>	
COVARIATE SHIFT ADAPTATION ON LEARNING FROM POSITIVE AND UNLABELED DATA.....	4838
<i>Tomoya Sakai, Nobuyuki Shimizu</i>	
GRANGER-CAUSAL ATTENTIVE MIXTURES OF EXPERTS: LEARNING IMPORTANT FEATURES WITH NEURAL NETWORKS .....	4846
<i>Patrick Schwab, Djordje Miladinovic, Walter Karlen</i>	
CONGESTION GRAPHS FOR AUTOMATED TIME PREDICTIONS .....	4854
<i>Arik Senderovich, J. Christopher Beck, Avigdor Gal, Matthias Weidlich</i>	
UNSUPERVISED LEARNING WITH CONTRASTIVE LATENT VARIABLE MODELS .....	4862
<i>Kristen A. Severson, Soumya Ghosh, Kenney Ng</i>	
SPARSE REJECT OPTION CLASSIFIER USING SUCCESSIVE LINEAR PROGRAMMING.....	4870
<i>Kulin Shah, Naresh Manwani</i>	

GEOMETRIC HAWKES PROCESSES WITH GRAPH CONVOLUTIONAL RECURRENT NEURAL NETWORKS.....	4878
<i>Jin Shang, Mingxuan Sun</i>	
MEAL: MULTI-MODEL ENSEMBLE VIA ADVERSARIAL LEARNING .....	4886
<i>Zhiqiang Shen, Zhankui He, Xiangyang Xue</i>	
MULTI-VIEW ANOMALY DETECTION: NEIGHBORHOOD IN LOCALITY MATTERS .....	4894
<i>Xiang-Rong Sheng, De-Chuan Zhan, Su Lu, Yuan Jiang</i>	
VIRTUAL-TAOBAO: VIRTUALIZING REAL-WORLD ONLINE RETAIL ENVIRONMENT FOR REINFORCEMENT LEARNING.....	4902
<i>Jing-Cheng Shi, Yang Yu, Qing Da, Shi-Yong Chen, An-Xiang Zeng</i>	
AUTOMATIC CODE REVIEW BY LEARNING THE REVISION OF SOURCE CODE .....	4910
<i>Shu-Ting Shi, Ming Li, David Lo, Ferdian Thung, Xuan Huo</i>	
SUBLINEAR TIME NUMERICAL LINEAR ALGEBRA FOR STRUCTURED MATRICES .....	4918
<i>Xiaofei Shi, David P. Woodruff</i>	
LABEL EMBEDDING WITH PARTIAL HETEROGENEOUS CONTEXTS .....	4926
<i>Yaxin Shi, Donna Xu, Yuangang Pan, Ivor W. Tsang, Shirui Pan</i>	
EVALUATING RECOMMENDER SYSTEM STABILITY WITH INFLUENCE-GUIDED FUZZING.....	4934
<i>David Shriver, Sebastian Elbaum, Matthew B. Dwyer, David S. Rosenblum</i>	
SENSITIVITY ANALYSIS OF DEEP NEURAL NETWORKS.....	4943
<i>Hai Shu, Hongtu Zhu</i>	
TRANSFERABLE CURRICULUM FOR WEAKLY-SUPERVISED DOMAIN ADAPTATION.....	4951
<i>Yang Shu, Zhangjie Cao, Mingsheng Long, Jianmin Wang</i>	
UNSUPERVISED TRANSFER LEARNING FOR SPOKEN LANGUAGE UNDERSTANDING IN INTELLIGENT AGENTS .....	4959
<i>Aditya Siddhant, Anuj Goyal, Angeliki Metallinou</i>	
SAFE POLICY IMPROVEMENT WITH BASELINE BOOTSTRAPPING IN FACTORED ENVIRONMENTS .....	4967
<i>Thiago D. Simão, Matthijs T. J. Spaan</i>	
COMPOSABLE MODULAR REINFORCEMENT LEARNING .....	4975
<i>Christopher Simpkins, Charles Isbell</i>	

## PART 2

HIERARCHICAL CONTEXT ENABLED RECURRENT NEURAL NETWORK FOR RECOMMENDATION.....	4983
<i>Kyungwoo Song, Mingi Ji, Sungrae Park, Il-Chul Moon</i>	
DIVERSITY-DRIVEN EXTENSIBLE HIERARCHICAL REINFORCEMENT LEARNING .....	4992
<i>Yuhang Song, Jianyi Wang, Thomas Lukasiewicz, Zhenghua Xu, Mai Xu</i>	
ON THE PERSISTENCE OF CLUSTERING SOLUTIONS AND TRUE NUMBER OF CLUSTERS IN A DATASET.....	5000
<i>Amber Srivastava, Mayank Baranwal, Srinivasa Salapaka</i>	

SOFT FACIAL LANDMARK DETECTION BY LABEL DISTRIBUTION LEARNING .....	5008
<i>Kai Su, Xin Geng</i>	
PARTIAL MULTI-LABEL LEARNING BY LOW-RANK AND SPARSE DECOMPOSITION .....	5016
<i>Lijuan Sun, Songhe Feng, Tao Wang, Congyan Lang, Yi Jin</i>	
MULTI-PRECISION QUANTIZED NEURAL NETWORKS VIA ENCODING DECOMPOSITION OF $\{-1,+1\}$ .....	5024
<i>Qigong Sun, Fanhua Shang, Kang Yang, Xiufang Li, Yan Ren, Licheng Jiao</i>	
NON-ERGODIC CONVERGENCE ANALYSIS OF HEAVY-BALL ALGORITHMS .....	5033
<i>Tao Sun, Penghang Yin, Dongsheng Li, Chun Huang, Lei Guan, Hao Jiang</i>	
NETWORK STRUCTURE AND TRANSFER BEHAVIORS EMBEDDING VIA DEEP PREDICTION MODEL .....	5041
<i>Xin Sun, Zenghui Song, Junyu Dong, Yongbo Yu, Claudia Plant, Christian Böhm</i>	
LEARNING VINE COPULA MODELS FOR SYNTHETIC DATA GENERATION.....	5049
<i>Yi Sun, Alfredo Cuesta-Infante, Kalyan Veeramachaneni</i>	
MATRIX COMPLETION FOR GRAPH-BASED DEEP SEMI-SUPERVISED LEARNING .....	5058
<i>Fariborz Taherkhani, Hadi Kazemi, Nasser M. Nasrabadi</i>	
VARIATIONAL AUTOENCODER WITH IMPLICIT OPTIMAL PRIORS.....	5066
<i>Hiroshi Takahashi, Tomoharu Iwata, Yuki Yamanaka, Masanori Yamada, Satoshi Yagi</i>	
CHARACTER N-GRAM EMBEDDINGS TO IMPROVE RNN LANGUAGE MODELS.....	5074
<i>Sho Takase, Jun Suzuki, Masaaki Nagata</i>	
CORESET STOCHASTIC VARIANCE-REDUCED GRADIENT WITH APPLICATION TO OPTIMAL MARGIN DISTRIBUTION MACHINE.....	5083
<i>Zhi-Hao Tan, Teng Zhang, Wei Wang</i>	
REFINING COARSE-GRAINED SPATIAL DATA USING AUXILIARY SPATIAL DATA SETS WITH VARIOUS GRANULARITIES .....	5091
<i>Yusuke Tanaka, Tomoharu Iwata, Toshiyuki Tanaka, Takeshi Kurashima, Maya Okawa, Hiroyuki Toda</i>	
CROSS-VIEW LOCAL STRUCTURE PRESERVED DIVERSITY AND CONSENSUS LEARNING FOR MULTI-VIEW UNSUPERVISED FEATURE SELECTION .....	5101
<i>Chang Tang, Xinzhong Zhu, Xinwang Liu, Lizhe Wang</i>	
AN INTEGRAL TAG RECOMMENDATION MODEL FOR TEXTUAL CONTENT .....	5109
<i>Shijie Tang, Yuan Yao, Suwei Zhang, Feng Xu, Tianxiao Gu, Hanghang Tong, Xiaohui Yan, Jian Lu</i>	
SELF-PACED ACTIVE LEARNING: QUERY THE RIGHT THING AT THE RIGHT TIME.....	5117
<i>Ying-Peng Tang, Sheng-Jun Huang</i>	
A RADICAL-AWARE ATTENTION-BASED MODEL FOR CHINESE TEXT CLASSIFICATION.....	5125
<i>Hanqing Tao, Shiwei Tong, Hongke Zhao, Tong Xu, Binbin Jin, Qi Liu</i>	
OPTIMIZATION OF HIERARCHICAL REGRESSION MODEL WITH APPLICATION TO OPTIMIZING MULTI-RESPONSE REGRESSION K-ARY TREES.....	5133
<i>Pooya Tavallali, Peyman Tavallali, Mukesh Singhal</i>	

HOLOGRAPHIC FACTORIZATION MACHINES FOR RECOMMENDATION .....	5143
<i>Yi Tay, Shuai Zhang, Anh Tuan Luu, Siu Cheung Hui, Lina Yao, Tran Dang Quang Vinh</i>	
CLIPPED MATRIX COMPLETION: A REMEDY FOR CEILING EFFECTS.....	5151
<i>Takeshi Teshima, Miao Xu, Issei Sato, Masashi Sugiyama</i>	
A NON-CONVEX OPTIMIZATION APPROACH TO CORRELATION CLUSTERING .....	5159
<i>Erik Thiel, Morteza Haghiri Chehreghani, Devdatt Dubhashi</i>	
LEARNING COMPETITIVE AND DISCRIMINATIVE RECONSTRUCTIONS FOR ANOMALY DETECTION .....	5167
<i>Kai Tian, Shuigeng Zhou, Jianping Fan, Jihong Guan</i>	
NATURAL OPTION CRITIC .....	5175
<i>Saket Tiwari, Philip S. Thomas</i>	
LEARNING TRIGGERS FOR HETEROGENEOUS TREATMENT EFFECTS.....	5183
<i>Christopher Tran, Elena Zheleva</i>	
IMPROVING GAN WITH NEIGHBORS EMBEDDING AND GRADIENT MATCHING.....	5191
<i>Ngoc-Trung Tran, Tuan-Anh Bui, Ngai-Man Cheung</i>	
PREDICTING URBAN DISPERSAL EVENTS: A TWO-STAGE FRAMEWORK THROUGH DEEP SURVIVAL ANALYSIS ON MOBILITY DATA .....	5199
<i>Amin Vahedian, Xun Zhou, Ling Tong, W. Nick Street, Yanhua Li</i>	
AUTOMATIC BAYESIAN DENSITY ANALYSIS .....	5207
<i>Antonio Vergari, Alejandro Molina, Robert Peharz, Zoubin Ghahramani, Kristian Kersting, Isabel Valera</i>	
ROBUST ANOMALY DETECTION IN VIDEOS USING MULTILEVEL REPRESENTATIONS.....	5216
<i>Hung Vu, Tu Dinh Nguyen, Trung Le, Wei Luo, Dinh Phung</i>	
CAMO: A COLLABORATIVE RANKING METHOD FOR CONTENT BASED RECOMMENDATION.....	5224
<i>Chengwei Wang, Tengfei Zhou, Chen Chen, Tianlei Hu, Gang Chen</i>	
VIDEO INPAINTING BY JOINTLY LEARNING TEMPORAL STRUCTURE AND SPATIAL DETAILS .....	5232
<i>Chuan Wang, Haibin Huang, Xiaoguang Han, Jue Wang</i>	
BOUNDING UNCERTAINTY FOR ACTIVE BATCH SELECTION .....	5240
<i>Hanmo Wang, Runwu Zhou, Yi-Dong Shen</i>	
ADVERSARIAL BINARY COLLABORATIVE FILTERING FOR IMPLICIT FEEDBACK.....	5248
<i>Haoyu Wang, Nan Shao, Defu Lian</i>	
THEORETICAL ANALYSIS OF LABEL DISTRIBUTION LEARNING .....	5256
<i>Jing Wang, Xin Geng</i>	
ORDERLY SUBSPACE CLUSTERING .....	5264
<i>Jing Wang, Atsushi Suzuki, Linchuan Xu, Feng Tian, Liang Yang, Kenji Yamanishi</i>	
SVM-BASED DEEP STACKING NETWORKS.....	5273
<i>Jingyuan Wang, Kai Feng, Junjie Wu</i>	



AN EFFICIENT APPROACH TO INFORMATIVE FEATURE EXTRACTION FROM MULTIMODAL DATA.....	5281
<i>Lichen Wang, Jiaxiang Wu, Shao-Lun Huang, Lizhong Zheng, Xiangxiang Xu, Lin Zhang, Junzhou Huang</i>	
SCALABLE DISTRIBUTED DL TRAINING: BATCHING COMMUNICATION AND COMPUTATION.....	5289
<i>Shaoqi Wang, Aidi Pi, Xiaobo Zhou</i>	
HYPERADAM: A LEARNABLE TASK-ADAPTIVE ADAM FOR NETWORK TRAINING.....	5297
<i>Shipeng Wang, Jian Sun, Zongben Xu</i>	
A SHARPER GENERALIZATION BOUND FOR DIVIDE-AND-CONQUER RIDGE REGRESSION .....	5305
<i>Shusen Wang</i>	
ROBUSTNESS CAN BE CHEAP: A HIGHLY EFFICIENT APPROACH TO DISCOVER OUTLIERS UNDER HIGH OUTLIER RATIOS.....	5313
<i>Siqi Wang, En Zhu, Xiping Hu, Xinwang Liu, Qiang Liu, Jianping Yin, Fei Wang</i>	
SCNN: A GENERAL DISTRIBUTION BASED STATISTICAL CONVOLUTIONAL NEURAL NETWORK WITH APPLICATION TO VIDEO OBJECT DETECTION .....	5321
<i>Tianchen Wang, Jinjun Xiong, Xiaowei Xu, Yiyu Shi</i>	
EXPLAINABLE REASONING OVER KNOWLEDGE GRAPHS FOR RECOMMENDATION .....	5329
<i>Xiang Wang, Dingxian Wang, Canran Xu, Xiangnan He, Yixin Cao, Tat-Seng Chua</i>	
HYPERBOLIC HETEROGENEOUS INFORMATION NETWORK EMBEDDING .....	5337
<i>Xiao Wang, Yiding Zhang, Chuan Shi</i>	
TRANSFERABLE ATTENTION FOR DOMAIN ADAPTATION .....	5345
<i>Ximei Wang, Liang Li, Weirui Ye, Mingsheng Long, Jianmin Wang</i>	
MULTIPLE INDEPENDENT SUBSPACE CLUSTERINGS.....	5353
<i>Xing Wang, Jun Wang, Carlotta Domeniconi, Guoxian Yu, Guoqiang Xiao, Maozu Guo</i>	
DEEP METRIC LEARNING BY ONLINE SOFT MINING AND CLASS-AWARE ATTENTION.....	5361
<i>Xinshao Wang, Yang Hua, Elyor Kodirov, Guosheng Hu, Neil M. Robertson</i>	
UNIVERSAL APPROXIMATION PROPERTY AND EQUIVALENCE OF STOCHASTIC COMPUTING-BASED NEURAL NETWORKS AND BINARY NEURAL NETWORKS.....	5369
<i>Yanzhi Wang, Zheng Zhan, Liang Zhao, Jian Tang, Siyue Wang, Jiayu Li, Bo Yuan, Wujie Wen, Xue Lin</i>	
NON-AUTOREGRESSIVE MACHINE TRANSLATION WITH AUXILIARY REGULARIZATION.....	5377
<i>Yiren Wang, Fei Tian, Di He, Tao Qin, Chengxiang Zhai, Tie-Yan Liu</i>	
LEARNING COMPACT MODEL FOR LARGE-SCALE MULTI-LABEL DATA.....	5385
<i>Tong Wei, Yu-Feng Li</i>	
UNIFIED EMBEDDING ALIGNMENT WITH MISSING VIEWS INFERRING FOR INCOMPLETE MULTI-VIEW CLUSTERING.....	5393
<i>Jie Wen, Zheng Zhang, Yong Xu, Bob Zhang, Lunke Fei, Hong Liu</i>	

EXPLOITING LOCAL FEATURE PATTERNS FOR UNSUPERVISED DOMAIN ADAPTATION .....	5401
<i>Jun Wen, Risheng Liu, Nenggan Zheng, Qian Zheng, Zhefeng Gong, Junsong Yuan</i>	
ROBUSTSTL: A ROBUST SEASONAL-TREND DECOMPOSITION ALGORITHM FOR LONG TIME SERIES.....	5409
<i>Qingsong Wen, Jingkun Gao, Xiaomin Song, Liang Sun, Huan Xu, Shenghuo Zhu</i>	
EFFICIENT GAUSSIAN PROCESS CLASSIFICATION USING PÓLYA-GAMMA DATA AUGMENTATION.....	5417
<i>Florian Wenzel, Théo Galy-Fajou, Christan Donner, Marius Kloft, Manfred Opper</i>	
HOW DOES KNOWLEDGE OF THE AUC CONSTRAIN THE SET OF POSSIBLE GROUND- TRUTH LABELINGS?.....	5425
<i>Jacob Whitehill</i>	
UNCOVERING SPECIFIC-SHAPE GRAPH ANOMALIES IN ATTRIBUTED GRAPHS .....	5433
<i>Nannan Wu, Wenjun Wang, Feng Chen, Jianxin Li, Bo Li, Jinpeng Huai</i>	
POINT CLOUD PROCESSING VIA RECURRENT SET ENCODING.....	5441
<i>Pengxiang Wu, Chao Chen, Jingru Yi, Dimitris Metaxas</i>	
IMPROVING DOMAIN-SPECIFIC CLASSIFICATION BY COLLABORATIVE LEARNING WITH ADAPTATION NETWORKS.....	5450
<i>Si Wu, Jian Zhong, Wenming Cao, Rui Li, Zhiwen Yu, Hau-San Wong</i>	

**Author Index**