2017 16th IEEE International Conference on Machine Learning and Applications (ICMLA 2017)

Cancun, Mexico
18-21 December 2017

Pages 1-579

IEEE Catalog Number: CFP17592-POD
ISBN: 978-1-5386-1419-8

Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17592-POD
ISBN (Print-On-Demand):	978-1-5386-1419-8
ISBN (Online):	978-1-5386-1418-1

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
E-mail: curran@proceedings.com
Web: www.proceedings.com

Proceedings

16th IEEE International Conference on Machine Learning and Applications

ICMLA 2017

18–21 December 2017
Cancun, Mexico

Proceedings

16th IEEE International Conference on Machine Learning and Applications

ICMLA 2017

18–21 December 2017
Cancun, Mexico

Editors
Xuewen Chen, Bo Luo, Feng Luo, Vasile Palade, and M. Arif Wani

CPS
Conference Publishing Services

2017 16th IEEE International Conference on Machine Learning and Applications

ICMLA 2017

Table of Contents

Preface ..... **xxvi**
Organizing Committee ..... **xxviii**
Program Commitee ..... **xxix**
Keynotes ..... **xxxii**

C1A: Deep Learning I

Deep Learning of Cell Classification Using Microscope Images of Intracellular Microtubule Networks 1
Aleksei Shpilman (Saint Petersburg National Research Academic University of the Russian Academy of Sciences), Dmitry Boikiy (Saint Petersburg National Research Academic University of the Russian Academy of Sciences), Marina Polyakova (Moscow Institute of Physics and Technology), Daniel Kudenko (Department of Computer Science), Anton Burakov (A.N. Belozersky Intstitute of Physico-Chemical Biology), and Elena Nadezhdina (Institute of Protein Research of the Russian Academy of Sciences)

DeepPositioning: Intelligent Fusion of Pervasive Magnetic Field and WiFi Fingerprinting for Smartphone Indoor Localization via Deep Learning 7
Wei Zhang (Northeastern University), Rahul Sengupta (National Science Foundation Center for Big Learning), John Fodero (National Science Foundation Center for Big Learning), and Xiaolin Li (National Science Foundation Center for Big Learning)

Learning to Coordinate with Deep Reinforcement Learning in Doubles Pong Game 14
Elhadji Amadou Oury Diallo (Waseda University), Ayumi Sugiyama (Waseda University), and Toshiharu Sugawara (Waseda University)

Deep Learning for Microalgae Classification 20
Iago Correa (Federal University of Rio Grande), Paulo Drews (Federal University of Rio Grande), Silvia Botelho (Federal University of Rio Grande), Marcio Silva de Souza (Federal University of Rio Grande), and Virgínia Maria Tavano (Federal University of Rio Grande)

C1B: Clustering Methods with Applications

Anomaly Prediction Based on k-Means Clustering for Memory-Constrained Embedded Devices 26
Yuto Kitagawa, Tasuku Ishigoka (Center for Technology Innovation-Controls), and Takuya Azumi (Graduate School of Engineering Science Osaka University)

Clustering Distributed Short Time Series with Dense Patterns 34
Josenildo Costa da Silva (IFMA), Gustavo H. B. S. Oliveira (IFMA), Stefano Lodi (Universitá di Bologna), and Matthias Klusch (DFKI)

Modeling Over-Dispersion for Network Data Clustering 42
Lu Wang (Wayne State University), Dongxiao Zhu (Wayne State University), Ming Dong (Wayne State University), and Yan Li (University of Michigan)

Deep Learning Based Car Damage Classification 50
Kalpesh Patil (IIT Bombay), Mandar Kulkarni (TCS Innovation Labs), Anand Sriraman (TCS Innovation Labs), and Shirish Karande (TCS Innovation Labs)

C2A: Machine Learning Applications I

Attribute Assisted Interpretation Confidence Classification Using Machine Learning 55
Wolfgang Weinzierl (Schlumberger Danmark A/S)

A Hybrid Scheme for Fault Diagnosis with Partially Labeled Sets of Observations 61
Roozbeh Razavi-Far (University of Windsor), Ehsan Hallaji (University of Windsor), Mehrdad Saif (University of Windsor), and Luis Rueda (University of Windsor)

Predictive Modelling Strategies to Understand Heterogeneous Manifestations of Asthma in Early Life 68
Danielle Belgrave (Imperial College), Rachel Cassidy (Imperial College), Daniel Stamate (University of London), Adnan Custovic (Imperial College), Louise Fleming (NHLI), Andrew Bush (NHLI), and Sejal Saglani (NHLI)

Home Appliance Energy Disaggregation Using Low Frequency Data and Machine Learning Classifiers 76
Yan Gao (Clarkson University), Alan Schay (Clarkson University), Daqing Hou (Clarkson University), and Jorge Ortiz (IBM Research Center)

C2B: Computer Vision

On the Impacts of Noise from Group-Based Label Collection for Visual Classification 84
Maggie Wigness (US Army Research Laboratory) and Steven Gutstein (US Army Research Laboratory)

Learning Robust Video Synchronization without Annotations 92
Patrick Wieschollek (University of Tuebingen), Ido Freeman (University of Tuebingen), and Hendrik P.A. Lensch (University of Tuebingen)

Google's Cloud Vision API is Not Robust to Noise 101
Hossein Hosseini (University of Washington), Baicen Xiao (University of Washington), and Radha Poovendran (University of Washington)

Machine Learning in Appearance-Based Robot Self-Localization 106
Alexander Kuleshov (Skolkovo Institute of Science and Technology), Alexander Bernstein (Skolkovo Institute of Science and Technology), Evgeny Burnaev (Skolkovo Institute of Science and Technology), and Yury Yanovich (Kharkevich Institute for Information Transmission Problems RAS)

C3A: Text and Natural Language Processing

Learning Antecedent Structures for Event Coreference Resolution 113
Jing Lu (University of Texas at Dallas) and Vincent Ng (University of Texas at Dallas)

Automatic Generation and Recommendation for API Mashups 119
Qinghan Xue (Lehigh University), Lei Liu (Fujitsu Laboratories of America), Weipeng Chen (Fujitsu Laboratories of America), and Mooi Choo Chuah (Lehigh University)

Classification-Based Adaptive Web Scraper 125
Ujwal B V S (Samsung Research Institute), Bharat Gaind (Samsung Research Institute), Abhishek Kundu (Samsung Research Institute), Anusha Holla (Samsung Research Institute), and Mukund Rungta (Indian Institute of Technology)

C3B: Optimization and Advanced Learning Methods

Stochastic Primal-Dual Method on Riemannian Manifolds of Bounded Sectional Curvature 133
Masoud Badiei Khuzani (Harvard University) and Na Li (Harvard University)

Anytime Exploitation of Stragglers in Synchronous Stochastic Gradient Descent 141
Nuwan Ferdinand (University of Toronto), Benjamin Gharachorloo (University of Toronto), and Stark C. Draper (University of Toronto)

An Evolutionary Learning Approach to Self-configuring Image Pipelines in the Context of Carbon Fiber Fault Detection 147
Andreas Margraf (Fraunhofer IGCV), Anthony Stein (University of Augsburg), Leonhard Engstler (Fraunhofer IGCV), Steffen Geinitz (Fraunhofer IGCV), and Jörg Hähner (University of Augsburg)

Online Structure-Search for Sum-Product Networks 155
Aaron Dennis (Brigham Young University) and Dan Ventura (Brigham Young University)

C4A: Machine Learning Applications II

A Machine Learning Approach to Detecting Sensor Data Modification Intrusions in WBANs 161
Alexander Verner (Nova Southeastern University) and Dany Butvinik (The Open University of Israel)

Automatic Algorithm Recognition of Source-Code Using Machine Learning 170
Maged Shalaby (German University in Cairo), Tarek Mehrez (German University in Cairo), Amr El Mougy (German University in Cairo), Khalid Abdulnasser (German University in Cairo), and Aysha Al-Safty (German University in Cairo)

Realistic Traffic Generation for Web Robots 178
Kyle Brown (Wright State University) and Derek Doran (Wright State University)

C4B: Neural Networks

Incomplete Dot Products for Dynamic Computation Scaling in Neural Network Inference 186
Brad McDanel (Harvard University), Surat Teerapittayanon (Harvard University), and HT Kung (Harvard University)

Time-Sensitive Adaptation of Regularization Strength of Recurrent Neural Networks for Accurate Learning 194
Kangil Kim (Konkuk University)

Recognition of Acoustic Events Using Masked Conditional Neural Networks 199
Fady Medhat (University of York), David Chesmore (University of York), and John Robinson (University of York)

C5A: Deep Learning II

Parametric Exponential Linear Unit for Deep Convolutional Neural Networks 207
Ludovic Trottier (Laval University), Philippe Giguère (Laval University), and Brahim Chaib-draa (Laval University)

Understading Image Restoration Convolutional Neural Networks with Network Inversion 215
Églen Protas (Universidade Federal do Rio Grande - FURG), José Bratti (Universidade Federal do Rio Grande - FURG), Joel Gaya (Universidade Federal do Rio Grande - FURG), Paulo Drews (Universidade Federal do Rio Grande - FURG), and Silvia Botelho (Universidade Federal do Rio Grande - FURG)

Lecture Vdeo Indexing Using Boosted Margin Maximizing Neural Networks 221
Di Ma (Illinois Institute of Technology), Xi Zhang (Illinois Institute of Technology), Xu Ouyang (Illinois Institute of Technology), and Gady Agam (Illinois Institute of Technology)

C5B: Ensemble Methods

Direct Multiclass Boosting Using Base Classifiers' Posterior Probabilities Estimates 228
Mathias Bourel (Universidad de la Republica) and Badih Ghattas (Université Aix-Marseilled)

Classification of Pollen Grain Images Based on an Ensemble of Classifiers 234
David Gutierrez Arias (Institute of Computing - UNICAMP), Marcos Vinicius Mussel Cirne (Institute of Computing - UNICAMP), Josimar Edinson Chire, and Helio Pedrini (Institute of Computing - UNICAMP)

UoI-NMF Cluster: A Robust Nonnegative Matrix Factorization Algorithm for Improved Parts-Based Decomposition and Reconstruction of Noisy Data 241
Shashanka Ubaru (University of Minnesota at Twin Cities), Kesheng Wu (Lawrence Berkeley National Laboratory), and Kristofer E. Bouchard (Lawrence Berkeley National Laboratory)

C6A: Speech and Signal Processing

Deep Transductive Nonnegative Matrix Factorization for Speech Separation 249
Yalin Liu (National University of Defense Technology), Naiyang Guan (National University of Defense Technology), and Jie Liu (National University of Defense Technology)

An Empirical Study of Cross-Lingual Transfer Learning Techniques for Small-Footprint Keyword Spotting 255
Ming Sun (Alexa Machine Learning), Andreas Schwarz (Alexa Machine Learning), Minhua Wu (Alexa Machine Learning), Nikko Strom (Alexa Machine Learning), Spyros Matsoukas (Alexa Machine Learning), and Shiv Vitaladevuni (Alexa Machine Learning)

Wearable Motion Sensor Based Analysis of Swing Sports 261
Akash Anand (Samsung R&D Institute), Manish Sharma (Samsung R&D Institute), Rupika Srivastava (Samsung R&D Institute), Lakshmi Kaligounder (Samsung R&D Institute), and Divya Prakash (Samsung R&D Institute)

Multiple Kernel Representation Learning for WiFi-Based Human Activity Recognition 268
Han Zou (Department of Electrical Engineering and Computer Sciences), Yuxun Zhou (Department of Electrical Engineering and Computer Sciences), Jianfei Yang (School of Electrical and Electronics Engineering), Weixi Gu (Tsinghua-Berkeley Shenzhen Institute), Lihua Xie (School of Electrical and Electronics Engineering), and Costas Spanos (Department of Electrical Engineering and Computer Sciences)

C6B: Advanced Classification Methods

Multilabel Classification with Weighted Labels Using Learning Classifier Systems 275
Shabnam Nazmi (North Carolina A&T state university), Mohammad Razeghi-Jahromi (North Carolina A&T state university), and Abdollah Homaifar (North Carolina A&T state university)

Integrated Framework for Improving Large-Scale Hierarchical Classification 281
Azad Naik (George Mason University) and Huzefa Rangwala (George Mason University)

Stacking Methods for Hierarchical Classification 289
Felipe kenji Nakano (Federal University of Sao Carlos), Saulo Martiello Mastelini (State University of Londrina), Sylvio Barbon Jr. (State University of Londrina), and Ricardo Cerri (Federal University of Sao Carlos)

NMF-Based Label Space Factorization for Multi-label Classification 297
Mohammad Firouzi (University of Toronto), Mahmood Karimian (Sharif University of Technology), and Mahdieh Soleymani (Sharif University of Technology)

C7A: Machine Learning Applications III

Automatic Scoring of a Nonword Repetition Test 304
Meysam Asgari (Oregon Health & Science University), Jan Van Santen (Oregon Health & Science University), and Katina Papadakis (Oregon Health & Science University)

Geometrical Analysis of Machine Learning Security in Biometric Authentication Systems 309
Koosha Sadeghi (Arizona State University), Ayan Banerjee (Arizona State University), Javad Sohankar (Arizona State University), and Sandeep K. S. Gupta (Arizona State University)

Thyme: Improving Smartphone Prompt Timing Through Activity Awareness 315
Samaneh Aminikhanghahi (Washington State University), Ramin Fallahzadeh (Washington State University), Matthew Sawyer (Washington State University), Diane J. Cook (Washington State University), and Lawrence B. Holder (Washington State University)

EyeQual: Accurate, Explainable, Retinal Image Quality Assessment 323
Pedro Costa (INESC TEC), Aurelio Campilho (INESC TEC), Bryan Hooi (School of Computer Science), Asim Smailagic (Department of Electrical and Computer Engineering), Kris Kitani (Robotics Institute), Shenghua Liu (CAS Key Lab of Network Data Science and Technology Institute of Computing Technology), Christos Faloutsos (School of Computer Science), and Adrian Galdran (INESC TEC)

C8A: Advanced Learning Methods

The Effect of Communication on Noncooperative Multiplayer Multi-armed Bandit Problems 331
Noyan Evirgen (ETH Zurich) and Alper Kose (EPFL)

Comparing Transfer Learning and Traditional Learning Under Domain Class Imbalance 337
Karl R. Weiss (Florida Atlantic University) and Taghi M. Khoshgoftaar (Florida Atlantic University)

RobustSPAM for Inference from Noisy Longitudinal Data and Preservation of Privacy 344
Anna Palczewska (University of Leeds), Jan Palczewski (University of Leeds), Georgios Aivaliotis (University of Leeds), and Lukasz Kowalik (University of Warsaw)

On the Limitation of Convolutional Neural Networks in Recognizing Negative Images 352
Hossein Hosseini (University of Washington), Baicen Xiao (University of Washington), Mayoore Jaiswal (University of Washington), and Radha Poovendran (University of Washingto)

Special Session: Machine Learning Algorithms Systems and Applications

A New Framework for Fine Tuning of Deep Networks 359
M. Arif Wani (University of Kashmir) and Saduf Afzal (University of Kashmir)

HDLTex: Hierarchical Deep Learning for Text Classification 364
Kamran Kowsari (University of Virginia), Donald E. Brown (University of Virginia), Mojtaba Heidarysafa (University of Virginia), Kiana Jafari Meimandi (University of Virginia), Matthew S. Gerber (University of Virginia), and Laura E. Barnes (University of Virginia)

A Noise Prediction and Time-Domain Subtraction Approach to Deep Neural Network Based Speech Enhancement 372
Babafemi O. Odelowo (Georgia Institute of Technology) and David V. Anderson (Georgia Institute of Technology)

Granular Computing with Compatibility Based Intuitionistic Fuzzy Rough Sets 378
Sibasis Bandyopadhyay (University of Regina), JingTao Yao (University of Regina), and Yan Zhang (University of Regina)

Subject-Dependent SSVEP Identification Using GMM Training and Adaptation 384
Omid Dehzangi (University of Michigan-Dearborn) and Muhamed Farooq (University of Michigan-Dearborn)

Supervised Machine Learning Based Surface Inspection by Synthetizing Artificial Defects 390
Matthias Haselmann (Polymer Competence Center Leoben GmbH) and Dieter Gruber (Polymer Competence Center Leoben GmbH)

Adventure Game with a Neural Network Controlled Non-playing Character 396
Michael Weeks (Georgia State University), David Binnion (Georgia State University), Andre Chase Randall (Georgia State University), and Vibhuti Patel (Georgia State University)

A New Approach to Segment Hemorrhagic Stroke in Computed Tomography via Optimum Path Snakes 402
Solon A. Peixoto (Programa de Pós-Graduação em Ciência da Computação (PPGCC)), Aldisio G. Medeiros (Programa de Pós-Graduação em Ciência da Computação (PPGCC)), Antonio Carlos. S. Barros (Programa de Pós-Graduação em Ciência da Computação (PPGCC)), Victor Hugo C. de Albuquerque (Programa de Pós-Graduação em Informática Aplicada (PPGIA)), and Pedro Pedrosa Rebouças Filho (Programa de Pós-Graduação em Ciência da Computação (PPGCC))

Automated Patent Classification Using Word Embedding 408
Mattyws F. Grawe (Federal University of Mato Grosso), Claudia A. Martins (Federal University of Mato Grosso), and Andreia G. Bonfante (Federal University of Mato Grosso)

Anomaly Detection in Multivariate Non-stationary Time Series for Automatic DBMS Diagnosis 412
Doyup Lee (POSTECH)

RBF-FIRMLP Architecture for Digit Recognition 420
Cristinel Codrescu (University of Salzburg)

Incremental Dynamic Search Solver 426
Ali Hmer (University of Regina) and Malek Mouhoub (University of Regina)

Special Session: Machine Learning in Big Data and Information Security

DDoS Attack Modeling and Detection Using SMO 432
Salva Daneshgadeh (Middle East Technical University), Nazife Baykal (Middle East Technical University), and eyda Ertekin (Middle East Technical University)

Cybersecurity Automated Information Extraction Techniques: Drawbacks of Current Methods, and Enhanced Extractors 437
Robert A. Bridges (Oak Ridge National Laboratory), Kelly M.T. Huffer (Oak Ridge National Laboratory), Corinne L. Jones (University of Washington), Michael D. Iannacone (Oak Ridge National Laboratory), and John R. Goodall (Oak Ridge National Laboratory)

Privacy Preserving Record Linkage Using MetaSoundex Algorithm 443
Keerthi Koneru (Florida State University) and Cihan Varol (Sam Houston State University)

Machine Learning Methods Used in Evaluations of Secure Biometric System Components 448
Bilgehan Arslan (Gazi University), Mehtap Ulker (Gazi University), and Seref Sagiroglu (Gazi University)

Automated Behavioral Analysis of Malware: A Case Study of WannaCry Ransomware 454
Qian Chen (The University of Texas at San Antonio) and Robert A. Bridges (Oak Ridge National Laboratory)

Automatic Bitcoin Address Clustering 461
Dmitry Ermilov (Skolkovo Institute of Science and Technology (Skoltech)), Maxim Panov (Skolkovo Institute of Science and Technology (Skoltech)), and Yury Yanovich (Kharkevich Institute for Information Transmission Problems RAS)

Special Session: Machine Learning in Energy Applications

Forecasting Domestic Hot Water Demand in Residential House Using Artificial Neural Networks 467
Alexandra Delorme-Costil (IMT) and Jean-Jacques Bezian (IMT)

A Learning Framework for Control-Oriented Modeling of Buildings 473
Javier Rubio-Herrero (St. Mary's University), Vikas Chandan (Pacific Northwest National Laboratory), Charles Siegel (Pacific Northwest National Laboratory), Abhinav Vishnu (Pacific Northwest National Laboratory), and Draguna Vrabie (Pacific Northwest National Laboratory)

Multistep-ahead Streamflow and Reservoir Level Prediction Using ANNs for Production Planning in Hydroelectric Stations 479
Jorge Hernandez-Ambato (ESPOCH), Gabriel Asqui-Santillan (ESPOCH), Alberto Arellano (ESPOCH), and Carlos Cunalata (CELEC-EP HidroAgoyán)

Modelling of Fuzzy Logic Controller of a Maximum Power Point Tracker Based on Artificial Neural Network 485
Rabah Benkercha (University of Médéa), Samir Moulahoum (University of Médéa), and Ilhami Colak (Nisantasi University)

Efficient Prediction of Dynamic Tariff in Smart Grid Using CGP Evolved Artificial Neural Networks 493
Gul Muhammad Khan (University of Engineering and Technology Peshawar), Rabia Arshad (University of Engineering and Technology Peshawar), and Nadia Masood Khan (University of Engineering and Technology Peshawar)

Solar Radiation Prediction Improvement Using Weather Forecasts 499
Sam Sanders (University of Georgia), Chris Barrick (University of Georgia), Frederick Maier (University of Georgia), and Khaled Rasheed (University of Georgia)

Prediction of Power Grid Failure Using Neural Network Learning 505
Carmen Haseltine (University of West Florida) and Eman El-Sheikh Eman (Unversity of West Florida)

Special Session: Machine Learning in Smart Grid

A Review of Deep Learning Methods Applied on Load Forecasting 511
Abdulaziz Almalaq (University of Denver) and George Edwards (University of Denver)

Mitigating IoT-based Cyberattacks on the Smart Grid 517
Yasin Yilmaz (University of South Florida) and Suleyman Uludag (University of Michigan)

A Novel Application of Naive Bayes Classifier in Photovoltaic Energy Prediction 523
Ramazan Bayindir (Gazi University), Mehmet Yesilbudak (Nevsehir Haci Bektas Veli University), Medine Colak (Gazi University), and Naci Genc (Yuzuncu Yil University)

Special Session: Machine Learning Applications in Education

Application of Decision Trees for Detection of Student Dropout Profiles 528
Ricardo Timaran Pereira (Universidad de Nariño) and Javier Caicedo Zambrano (Universidad de Nariño)

Student Retention Pattern Prediction Employing Linguistic Features Extracted from Admission Application Essays 532
Mitsunori Ogihara (University of Miami) and Gang Ren (University of Miami)

Component Based Architecture for the Control of Crossing Regions in Railway Networks 540
Farooq Ahmad (COMSATS Institute of Information Technology Lahore), Ayesha Sadiq (Monash University), Ana Maria Martinez-Enriquez (CINVESTAV-IPN), Aslam Muhammad (University of Engineering and Technology), Muhammad Waqas Anwar (COMSATS Institute of Information Technology Lahore), Usama Ujaz Bajwa (COMSATS Institute of Information Technology Lahore), Mudasser Naseer (Wenzhou-Kean University), and Sher Afzal Khan (King Abdul Aziz University)

Classification of ECG Arrhythmia with Machine Learning Techniques 546
Halil Ibrahim Bülbül (Gazi University), Nese Usta (Gazi University), and Musa Yildiz (Hoca Ahmet Yesevi University)

Human Motion Trajectory Analysis Based Video Summarization 550
Muhammad Ajmal (Department of Computer Science COMSATS Institute of Information Technology Lahore), Mudasser Naseer (Department of Computer Science Wenzhou-Kean University Wenzhou), Farooq Ahmad (Department of Computer Science COMSATS Institute of Information Technology Lahore), and Asma Saleem (Division of Science and Technology University of Education Lahore)

A Simple Neuro-Heuristic Computational Intelligence Algorithm for Thin Film Flow Equation Arising in Physical Models 556
Iftikhar Ahmad (University of Gujrat), Bushra Mukhtar (Department of Mathematics University of Gujrat), Kadir Kutlu (Recep Tayyip Erdogan University Rize), and Farooq Ahmad (COMSAT)

Special Session: Machine Learning for Predictive Models in Engineering Applications

Support Vector Regression for Predicting the Enhancement Duration of Software Projects 562
Cuauhtemoc Lopez-Martin (Universidad de Guadalajara), Shadi Banitaan (University of Detroit Mercy), Andres Garcia-Floriano (Universidad Mexiquense del Bicentenario), and Cornelio Yanez-Marquez

Audio Signal Reconstruction Using Cartesian Genetic Programming Evolved Artificial Neural Network (CGPANN) 568
Nadia Masood Khan (University of Engineering and Technology Peshawar) and Gul Muhammad Khan (University of Engineering and Technology Peshawar)

Forward Looking Sonar Scene Matching Using Deep Learning 574
Pedro Otávio Cardozo de Souza Ribeiro (Universidade Federal do Rio Grande), Matheus Machado dos Santos (Universidade Federal do Rio Grande), Paulo Lilles Jorge Drews-Jr (Universidade Federal do Rio Grande), and Silvia Silva da Costa Botelho (Universidade Federal do Rio Grande)

Brace Treatment Monitoring Solution for Idiopathic Scoliosis Patients 580
Bhavani Anantapur Bache (University of Michigan-Dearborn), Omar Iftikhar (University of Michigan-Dearborn), and Omid Dehzangi (University of Michigan-Dearborn)

Exploring the Impact of Clone Refactoring on Test Code Size in Object-Oriented Software 586
Badri Mourad (University of Quebec at Trois-Rivières), Linda Badri (University of Quebec at Trois-Rivières), Oussama Hachemane (University of Quebec at Trois-Rivières), and Alexandre Ouellet (University of Quebec at Trois-Rivières)

Evaluating Non-personalized Single-Heuristic Active Learning Strategies for Collaborative Filtering Recommender Systems 593
Georges Chaaya (Cedric Laboratory), Elisabeth Metais (Cedric Laboratory), Jacques Bou Abdo (Department of Computer Science), Raja Chiky (LISITE Laboratory), Jacques Demerjian (LARIFA-EDST Laboratory), and Kablan Barbar (LARIFA-EDST Laboratory)

Railway Incident Ranking with Machine Learning 601
Evgeni Bikov (Skolkovo Institute of Science and Technology, Moscow, Russia), Pavel Boyko (Skolkovo Institute of Science and Technology, Moscow, Russia), Evgeny Sokolov (JSC Russian Railways, Moscow, Russia), and Dmitry Yarotsky (Skolkovo Institute of Science and Technology, Moscow, Russia)

A Spatio - Temporal Hedonic House Regression Model 607
Timothy Oladunni (Bowie State University), Sharad Sharma (Bowie State University), and Raymond Tiwang (Bowie State University)

Foreclosure Sale and House Value: Correlation or Causation? 613
Timothy Oladunni (Bowie State University), Sharad Sharma (Bowie State University), and Raymond Tiwang (Bowie State University)

Predictive Models of Hard Drive Failures Based on Operational Data 619
Nicolas Aussel (Zodiac Inflight Innovations), Samuel Jaulin (Zodiac Inflight Innovations), Guillaume Gandon (Zodiac Inflight Innovations), Yohan Petetin (Universite Paris-Saclay), Eriza Fazli (Zodiac Inflight Innovations), and Sophie Chabridon (Universite Paris-Saclay)

Bayesian Networks for Inverse Inference in Manufacturing Bayesian Networks 626
Avadhut Sardeshmukh (TRDDC, TCS Research, Tata Consultancy Services Pune, India), Sreedhar Reddy (TRDDC, TCS Research, Tata Consultancy Services Pune, India), BP Gautham (TRDDC, TCS Research, Tata Consultancy Services Pune, India), and Amol Joshi (TRDDC, TCS Research, Tata Consultancy Services Pune, India)

Special Session: Machine Learning on Big Data

Novel Trends in Scaling Up Machine Learning Algorithms 632
Noel Lopes (UDI) and Bernardete Ribeiro (CISUC)

MapReduce Based Classification for Fault Detection in Big Data Applications 637
M. Omair Shafiq (Carleton University), Maryam Fekri (Carleton University), and Rami Ibrahim (Carleton University)

Learning Effective Query Management Strategies from Big Data 643
Loredana Caruccio (University of Salerno), Vincenzo Deufemia (University of Salerno), and Giuseppe Polese (University of Salerno)

A Machine Learning Tool for Supporting Advanced Knowledge Discovery from Chess Game Data 649
James A. Brown (University of Manitoba), Alfredo Cuzzocrea (University of Trieste), Michael Kresta (University of Manitoba), Korbin D.L. Kristjanson (University of Manitoba), Carson K. Leung (University of Manitoba), and Timothy W. Tebinka (University of Manitoba)

Advanced ECHMM-Based Machine Learning Tools for Complex Big Data Applications 655
Alfredo Cuzzocrea (University of Trieste and ICAR-CNR), Enzo Mumolo (University of Trieste), and Gianni Vercelli (University of Genova)

Special Session: Machine Learning Applications in Psychiatric Research

A Cluster Analysis of Challenging Behaviors in Autism Spectrum Disorder 661
Elizabeth Stevens (Chapman University), Abigail Atchison (Chapman University), Laura Stevens (University of Colorado), Esther Hong (Center for Autism and Related Disorders), Doreen Granpeesheh (Center for Autism and Related Disorders), Dennis Dixon (Center for Autism and Related Disorders), and Erik Linstead (Chapman University)

Predicting Psychosis Using the Experience Sampling Method with Mobile Apps 667
Daniel Stamate (University of London), Andrea Katrinecz (University of London), Wajdi Alghamdi (University of London), Daniel Stahl (King's College London), Philippe Delespaul (Maastricht University Medical Centre), Jim van Os (Maastricht University Medical Centre), and Sinan Guloksuz (Maastricht University Medical Centre)

Bayesian Nonparametric Clustering of Patients with Advanced Cancer on Anxiety and Depression 674
Yuelin Li (Memorial Sloan Kettering Cancer Center), Barry Rosenfeld (Fordham University), Hayley Pessin (Memorial Sloan Kettering Cancer Center), and William Breitbart (Memorial Sloan Kettering Cancer Center)

Conference Poster Papers

On Classifying Facial Races with Partial Occlusions and Pose Variations 679
Tarik Alafif (Umm Al-Qura University), Zeyad Hailat (Wayne State University), Melih Aslan (Wayne State University), and Xuewen Chen (Wayne State University)

Anomaly Detection in Earth Dam and Levee Passive Seismic Data Using Multivariate Gaussian 685
Wendy Fisher (Colorado School of Mines), Blake Jackson (Colorado School of Mines), Tracy Camp (Colorado School of Mines), and Valeria V. Krzhizhanovskaya (University of Amsterdam)

Image Analysis Tool with Laws' Masks to Bone Texture 691
Norma Ramirez Hernandez (University of Guadalajara), Maria Citlalli Hernandez Escareno (University of Guadalajara), and Juan Rodolfo Maestre Rendon (Universidad Politecnica de Sinaloa)

Multiple Kernel Learning Using Sparse Representation 695
Nicholas Klausner (Information System Technologies) and Mahmood R. Azimi-Sadjadi (Information System Technologies)

Ant Colony Optimization with Stepwise Localization of the Discrete Search Space to Solve Function Optimization Problems 701
Ryouei Takahashi (The Kyoto College of Graduate Studies for Informatics) and Yukihiro Nakamura (The Kyoto College of Graduate Studies for Informatics)

Putting Self-Supervised Token Embedding on the Tables 707
Marc Szafraniec (Ecole polytechnique), Gautier Marti (Route de Saclay), and Philippe Donnat (Michelin House)

Machine Learning Methods for 1D Ultrasound Breast Cancer Screening 711
Neil Joshi (The Johns Hopkins University), Seth Billings (The Johns Hopkins University), Erika Schwartz (The Johns Hopkins University), Susan Harvey (The Johns Hopkins University), and Philippe Burlina (The Johns Hopkins University)

A Hybrid Approach for Incorporating Deep Visual Features and Side Channel Information with Applications to AMD Detection 716
Arnaldo Horta (The Johns Hopkins University), Neil Joshi (The Johns Hopkins University), Michael Pekala (The Johns Hopkins University), Katia D. Pacheco (The Johns Hopkins University), Jun Kong (The Johns Hopkins University), Neil Bressler (The Johns Hopkins University), David E Freund (The Johns Hopkins University), and Philippe Burlina (The Johns Hopkins University)

Deep Mixture of Experts with Diverse Task Spaces 721
Jianping Fan (UNC-Charlotte), Tianyi Zhao (UNC-Charlotte), Zhenzhong Kuang (Hangzhou Dianzi University), Zhou Yu (Hangzhou Dianzi University), and Jun Yu (Hangzhou Dianzi University)

Privacy Setting Recommendation for Image Sharing 726
Jun Yu (Hangzhou Dianzi University), Zhenzhong Kuang (Hangzhou Dianzi University), Zhou Yu (Hangzhou Dianzi University), Dan Lin (Missouri University), and Jianping Fan (UNC-Charlotte)

An Investigation of How Neural Networks Learn from the Experiences of Peers Through Periodic Weight Averaging 731
Joshua Smith (University of Arkansas) and Michael Gashler (University of Arkansas)

Detection of Exfiltration and Tunneling over DNS 737
Anirban Das (Samsung Research America), Min-Yi Shen (Hewlett Packard Enterprise), Madhu Shashanka (Charles Schwab), and Jisheng Wang (Hewlett Packard Enterprise)

An Evolutionary Approach to General-Purpose Automated Speed and Lane Change Behavior 743
Carl-Johan Hoel (Chalmers University of Technology), Mattias Wahde (Chalmers University of Technology), and Krister Wolff (Chalmers University of Technology)

Computable Expert Knowledge in Computer Games 749
Kevin Fujii (UC Davis Department of Statistics), Fushing Hsieh (UC Davis Department of Statistics), and Cho-Jui Hsieh (UC Davis Department of Computer Science and Statistics)

SUBIC: A Supervised Bi-Clustering Approach for Precision Medicine 755
Milad Zafar Nezhad (Wayne State University), Dongxiao Zhu (Wayne State University), Najibesadat Sadati (Wayne State University), Kai Yang (Wayne State University), and Phillip Levi (Wayne State University)

Reverse Engineering Regulatory Networks in Cells Using a Dynamic Bayesian Network and Mutual Information Scoring Function 761
Haodi Jiang (New Jersey Institute of Technology), Turki Turki (King Abdulaziz University), and Jason T. L. Wang (New Jersey Institute of Technology)

Relevancy Ranking of User Recommendations of Services Based on Browsing Patterns 765
Suresh Kumar Gudla (Samsung R and D Institute Bangalore), Joy Bose (Samsung), Venugopal Gajam (NIT Warangal), and Srinath Srinivasa (IIIT Bangalore)

A Neural Network Approach to Derive the Horizontal Spaces in Typefaces 769
Ayantha Randika (University of Colombo School of Computing) and Manjusri Ishwara Ellepola Wickramasinghe (University of Colombo School of Computing)

Human Action Recognition Based on a Two-stream Convolutional Network Classifier 774
Vinicius de Oliveira Silva (University of Brasilia), Flavio de Barros Vidal (University of Brasilia), and Alexandre Ricardo Soares Romariz (University of Brasilia)

Multidisciplinary Optimization in Decentralized Reinforcement Learning 779
Thanh Nguyen (Indiana University) and Snehasis Mukhopadhyay (Indiana University)

Bias Discovery in News Articles Using Word Vectors 785
Anish Anil Patankar (Samsung R and D Institute Bangalore) and Joy Bose (Samsung R and D Institute Bangalore)

Adjusting Real-Time Mode Transitions via Genetic Algorithms 789
Gordon Chalmers (University of Georgia) and Shelby H. Funk (University of Georgia)

Towards Self-Learning Optical Music Recognition 795
Alexander Pacha (TU Wien) and Horst Eidenberger (TU Wien)

Human Action Recognition Using Optical Flow and Convolutional Neural Networks 801
Marco Wrzalik (RheinMain University of Applied Sciences) and Dirk Krechel (RheinMain University of Applied Sciences)

Deep Learning Based Link Failure Mitigation 806
Shubham Khunteta (Advanced Modem) and Ashok Kumar Reddy Chavva (Advanced Modem)

Conformal Prediction Using Random Survival Forests 812
Henrik Boström (KTH Royal Institute of Technology), Lars Asker (Stockholm University), Ram Gurung (Stockholm University), Isak Karlsson (Stockholm University), Tony Lindgren (Stockholm University), and Panagiotis Papapetrou (Stockholm University)

A Hierarchical, Bulk-Synchronous Stochastic Gradient Descent Algorithm for Deep-Learning Applications on GPU Clusters 818
Guojing Cong (IBM Research) and Onkar Bhardwaj (IBM)

Deep Uncertainty Interpretation in Dyadic Human Activity Prediction 822
Maryam Ziaeefard (Laval University), Robert Bergevin (Laval University), and Jean-Francois Lalonde (Laval University)

Unsupervised Anomaly Detection for Digital Radio Frequency Transmissions 826
Michael Walton (SPAWAR Systems Center Pacific), Maurice Ayache (SPAWAR Systems Center Pacific), Logan Straatemeier (SPAWAR Systems Center Pacific), Daniel Gebhardt (SPAWAR Systems Center Pacific), and Benjamin Migliori (SPAWAR Systems Center Pacific)

ADL Classification Based on Autocorrelation Function of Inertial Signals 833
Walid Gomaa (1. Cyber-Physical Systems Lab.), Reda Elbasiony (1. Cyber-Physical Systems Lab.), and Sara Ashry (1. Cyber-Physical Systems Lab.)

Inferring Time when People Visit a Location Using Social Network Data 838
Md Moniruzzaman (University of Calgary) and Ken Barker (University of Calgary)

Predicting Waiting Time Overflow on Bank Teller Queues 842
Ricardo Silva Carvalho (University of Brasília), Rommel Novaes Carvalho (University of Brasília), Guilherme Novaes Ramos (University of Brasília), and Roberto Nunes Mourão (University of Brasília)

Deep Multi-camera People Detection 848
Tatjana Chavdarova (Idiap Research Institute and École polytechnique fédérale de Lausanne) and François Fleuret (Idiap Research Institute and École polytechnique fédérale de Lausanne)

Surface Roughness Discrimination Using Unsupervised Machine Learning Algorithms 854
Longhui Qin (Nanyang Technological University) and Yilei Zhang (Nanyang Technological University)

Medicare Fraud Detection Using Machine Learning Methods 858
Richard A. Bauder (Florida Atlantic University) and Taghi M. Khoshgoftaar (Florida Atlantic University)

Exposing Computer Generated Images by Eye's Region Classification via Transfer Learning of VGG19 CNN. 866
Tiago Carvalho (Federal Institute of São Paulo (IFSP)), Edmar R. S. de Rezende (CTI Renato Archer), Matheus T. P. Alves (Federal Institute of São Paulo (IFSP)), Fernanda K. C. Balieiro (Federal Institute of São Paulo (IFSP)), and Ricardo B. Sovat (Federal Institute of São Paulo (IFSP))

Real-Time Patient Adaptivity for Freezing of Gait Classification Through Semi-Supervised Neural Networks 871
Val Mikos (National University of Singapore), Chun-Huat Heng (National University of Singapore), Arthur Tay (National University of Singapore), Nicole Shuang Yu Chia (National Neuroscience Institute), Karen Mui Ling Koh (National Neuroscience Institute), Dawn May Leng Tan (Singapore General Hospital), and Wing Lok Au (National Neuroscience Institute)

HWBI : Health and Well-Being Index. A Neural Network Based Index Which Quantifies the Cumulative Impact of Lifestyle Habits on Personal Health and Well-Being and Demonstration of Its Application in Managing the Risk of Diabetes 877
Yesoda Bhargava (Samsung Research Institute) and Raj Roy (Samsung Research Institute)

An Empirical Study of the Hidden Matrix Rank for Neural Networks with Random Weights 883
Pablo A. Henriquez (Facultad de ingenieria y Ciencias) and Gonzalo A. Ruz (Facultad de ingenieria y Ciencias)

Better Worst-Case Complexity Analysis of the Block Coordinate Descent Method for Large Scale Machine Learning 889
Ziqiang Shi (Fujitsu Research and Development Center) and Rujie Liu (Fujitsu Research and Development Center)

Collaborative Filtering Based on the Latent Class Model for Attributes 893
Manabu Kobayashi (Shonan Institute of Technology), Kenta Mikawa (Shonan Institute of Technology), Masayuki Goto (Waseda University), Toshiyasu Matsushima (Waseda University), and Shigeichi Hirasawa (Waseda University)

Evolving Adaptive Traffic Signal Controllers for a Real Scenario Using Genetic Programming with an Epigenetic Mechanism 897
Esteban Ricalde (Memorial University of Newfoundland) and Wolfgang Banzhaf (Memorial University of Newfoundland)

Sequential Inverse Approximation of a Regularized Sample Covariance Matrix 903
Tomer Lancewicki (EBay Inc.)

Deep Ensembles for Imbalanced Classification 908
Nataliia Kozlovskaia (Yandex.Taxi) and Alexey Zaytsev (Skoltech)

Modeling a Classifier for Solving Safety-Critical Binary Classification Tasks 914
Ibrahim Alagoz, Thomas Hoiss (Automotive Safety Technologies GmbH), and Reinhard German (Department of Computer Science 7)

Integrating Prior Knowledge into Deep Learning 920
Michelangelo Diligenti (Universita' di Siena), Soumali Roychowdhury (IMT Lucca), and Marco Gori (Universita' di Siena)

Catch It If You Can: Real-Time Network Anomaly Detection with Low False Alarm Rates 924
Georgios Kathareios (IBM Research - Zurich), Andreea Anghel (IBM Research - Zurich), Akos Mate (IBM Research - Zurich), Rolf Clauberg (IBM Research - Zurich), and Mitch Gusat (IBM Research - Zurich)

Generalized Convolutional Neural Networks for Point Cloud Data 930
Aleksandr Savchenkov (Cylance), Andrew Davis (Cylancec), and Xuan Zhao (Cylance)

OP-DCI: A Riskless K-Means Clustering for Influential User Identification in MOOC Forum 936
Xiangyu Hou (The University of Hong Kong), Chi-Un Lei (The University of Hong Kong), and Yu-Kwong Kwok (The University of Hong Kong)

Identifying Anomalies in Parliamentary Expenditures of Brazilian Chamber of Deputies with Deep Autoencoders 940
Thiago Alencar Gomes (University of Brasilia), Rommel Novaes Carvalho (University of Brasilia), and Ricardo Silva Carvalho (University of Brasilia)

Recognition of Human Activities Using Fast and Adaptive Sparse Representation Based on Wearable Sensors 944
Long Cheng (Kiwii Power Technology Corporation), Yiyi Yu (Johns Hopkins University), Xinyang Liu (Rensselaer Polytechnic Institute), Jinyu Su (Rensselaer Polytechnic Institute), and Yani Guan (Rensselaer Polytechnic Institute)

Use of Machine Learning for Detection of Unaware Facial Recognition Without Individual Training 950
Christopher Bellman (University of Ontario Institute of Technology) and Miguel Vargas Martin (University of Ontario Institute of Technology)

Performance Comparison of Algorithms for Movie Rating Estimation 955
Alper Kose (EPFL), Can Kanbak (EPFL), and Noyan Evirgen (ETH Zurich)

Analyzing Facebook Activities for Personality Recognition 960
Asadzadeh Laleh (Southern Illinois University) and Rahimi Shahram (Southern Illinois University)

Using Short URLs in Tweets to Improve Twitter Opinion Mining 965
Andrei Pavel (Coventry University), Vasile Palade (Coventry University), Rahat Iqbal (Coventry University), and Diana Hintea (Coventry University)

Tree-Structured Curriculum Learning Based on Semantic Similarity of Text 971
Sanggyu Han (KAIST) and Sung-Hyon Myaeng (KAIST)

An Ensembled RBF Extreme Learning Machine to Forecast Road Surface Temperature 977
Bo Liu (Beijing Advanced Innovation Center for Future Internet Technology), Shuo Yan (School of Software Engineering), Huanling You (Institute of Urban Meteorology), Yan Dong (Institute of Urban Meteorology), Jianqiang Li (School of Software Engineering), Yong Li (School of Software Engineering), Jianlei Lang (Key Laboratory of Beijing on Regional Air Pollution Control), and Rentao Gu (Beijing Laboratory of Advanced Information Networks)

Schemes for Labeling Semantic Code Clones using Machine Learning 981
Abdullah Sheneamer, Hanan Hazazi (Regis University), Swarup Roy (North-Eastern Hill University), and Jugal Kalita (UCCS)

Evaluation of Microgesture Recognition Using a Smartwatch 986
Sonu Agarwal (Samsung R&D Institute) and Sanjay Ghosh (Samsung R&D Institute)

Automatic Fault Diagnosis of Drills Using Artificial Neural Networks 992
Caleb Vununu (Pukyong National University), Ki-Ryong Kwon (Pukyong National University), Eung-Joo Lee (Tongmyong University), Kwang-Seok Moon (Pukyong National University), and Suk-Hwan Lee (Tongmyong University)

Actively Discover Knowledge by Structural Risk Estimation 996
Weining Wu (Harbin Engineering University)

Learning Long-Term Situation Prediction for Automated Driving 1000
Stefan Hoermann (Institute of Measurement), Martin Bach (Institute of Measurement), and Klaus Dietmayer (Institute of Measurement)

Transfer Learning for Large Scale Data Using Subspace Alignment 1006
Nassara Elhadji-Ille-Gado (Universite de Technologie de Troyes), Edith Grall-Maes (Universite de Technologie de Troyes), and Malika Kharouf (Universite de Technologie de Troyes)

Malicious Software Classification Using Transfer Learning of ResNet-50 Deep Neural Network 1011
Edmar Rezende (University of Campinas), Guilherme Ruppert (Center for Information Technology Renato Archer), Tiago Carvalho (Federal Institute of São Paulo), Fabio Ramos (University of Sydney), and Paulo de Geus (University of Campinas)

Text Classification Using Hierarchical Sparse Representation Classifiers 1015
Neeraj Sharma (Indian Institute of Technology Mandi), A. D. Dileep (Indian Institute of Technology Mandi), and Veena Thenkanidiyoor (National Institute of Technology Goa)

Two-phase Parallel Learning to Identify Similar Structures Among Relational Databases 1020
Debora G. Reis (Ministry of Social Development of Brazil), Rommel N. Carvalho (University of Brasilia - UnB), Ricardo S. Carvalho (University of Brasilia - UnB), and Marcelo Ladeira (University of Brasilia - UnB)

Predicting Waiting Times in Radiation Oncology Using Machine Learning 1024
A. Joseph, Tarek Hijal (McGill University Health Centre), John Kildea (McGill University Health Centre), Laurie Hendren (McGill University), and David Herrera (McGill University)

Evaluating the Use of Brazilian Companies' Financial Footnotes Texts for Debt Variation Prediction 1030
Augusto Cesar Araujo Maeda (University of Brasilia (UnB)), Ricardo Silva Carvalho (Department of Research and Strategic Information), and Rommel Novaes Carvalho (University of Brasilia (UnB))

Human Action Recognition from Body-Part Directional Velocity Using Hidden Markov Models 1035
Sid Ahmed Walid Talha (IMT Lille Douai), Anthony Fleury (IMT Lille Douai), and Sebastien Ambellouis (Cosys Dept. - Leost)

Autoencoder-Enhanced Sum-Product Networks 1041
Aaron Dennis (Brigham Young University) and Dan Ventura (Brigham Young University)

Performance and Security Strength Trade-Off in Machine Learning Based Biometric Authentication Systems 1045
Koosha Sadeghi (Arizona State University), Ayan Banerjee (Arizona State University), Javad Sohankar (Arizona State University), and Sandeep K. S. Gupta (Arizona State University)

Predicting Hotel Bookings Cancellation with a Machine Learning Classification Model 1049
Nuno Antonio (ISCTE-IUL: Department of Information Technology), Ana de Almeida (ISCTE-IUL: Department of Information Science and Technology), and Luis Nunes (ISCTE-IUL: Department of Information Science and Technology)

Structured Causal Inference for Rare Events: An Industrial Application to Analyze Heating-Cooling Device Failure 1055
Pranjul Yadav (Criteo), Unmesh Kurup (Robert Bosch LLC), and Mohak Shah (Robert Bosch LLC)

Monitoring Health Changes in Congestive Heart Failure Patients Using Wearables and Clinical Data 1061
Robert Fisher (Carnegie Mellon University), Asim Smailagic (Carnegie Mellon University), and George Sokos (West Virginia University School of Medicine)

Histogram-Based Asymmetric Relabeling for Learning from Only Positive and Unlabeled Data 1065
Tom Arjannikov (University of Victoria) and George Tzanetakis (University of Victoria)

FIT-EVE&ADAM: Estimation of Velocity & Energy for Automated Diet Activity Monitoring 1071
Junghyo Lee (Arizona State University), Prajwal Paudyal (Arizona State University), Ayan Banerjee (Arizona State University), and Sandeep K. S. Gupta (Arizona State University)

Early Prediction of College Attrition Using Data Mining 1075
Luiz Carlos Barbosa Martins (University of Brasilia), Rommel N. Carvalho (University of Brasilia (UnB)), Ricardo S. Carvalho (Ministry of Transparency), Márcio C. Victorino (University of Brasilia (UnB)), and Maristela Holanda (University of Brasilia (UnB))

Model Guided Deep Learning Approach Towards Prediction of Physical System Behavior 1079
Subhasish Das (Arizona State University), Anurag Agrawal (Arizona State University), Ayan Banerjee (Arizona State University), and Sandeep K. S. Gupta (Arizona State University)

Time-Sensitive Behavior Prediction in a Health Social Network 1083
Amnay Amimeur (University of Oregon), NhatHai Phan (New Jersey Institute of Technology), Dejing Dou (University of Oregon), David Kil (Health Mantic Inc.), and Brigitte Piniewski (PeaceHealth Laboratories)

Incremental Open Set Intrusion Recognition Using Extreme Value Machine 1089
James Henrydoss (University of Colorado Colorado Springs), Steve Cruz (University of Colorado Colorado Springs), Ethan M. Rudd (University of Colorado Colorado Springs), Manuel Günther (University of Colorado Colorado Springs), and Terrance E. Boult (University of Colorado Colorado Springs)

Mixed Type Multi-attribute Pairwise Comparisons Learning 1094
Nunung Nurul Qomariyah (University of York) and Dimitar Kazakov (University of York)

Classification of UXO Using Convolutional Networks Trained on a Limited Dataset 1098
Anderson Lebbad (Villanova University), Garrett Clayton (Villanova University), and C. Nataraj (Villanova University)

Rank Learning by Ordinal Gerrymandering 1102
Stefano Fenu (Georgia Institute of Technology) and Chris Rozell (Georgia Institute of Technology)

Efficient Deep Learning Model for Text Classification Based on Recurrent and Convolutional Layers 1108
Abdalraouf Hassan (University of Bridgeport) and Ausif Mahmood (University of Bridgeport)

Special Session Poster Papers

An Exploratory Study of Oral and Dental Health in Canada 1114
Andrei Belcin (University of Ottawa), Sean Floyd (University of Ottawa), Areej Asiri (University of Ottawa), and Herna Viktor (University of Ottawa)

A Retrieval-Based Dialogue System Utilizing Utterance and Context Embeddings 1120
Alexander Bartl (Maastricht University) and Gerasimos Spanakis (Maastricht University)

Strength Training: A Fitness Application for Indoor Based Exercise Recognition and Comfort Analysis 1126
Dipankar Das (Samsung R & D Institute India), Shiva Murthy Busetty (Samsung R & D Institute India), Vishal Bharti (Samsung R & D Institute India), and Prakhyath Kumar Hegde (Samsung R & D Institute India)

Recognition of Dynamic Hand Gestures from 3D Motion Data Using LSTM and CNN Architectures 1130
Chinmaya R. Naguri (Ohio University) and Razvan C. Bunescu (Ohio University)

A Mask-Based Post Processing Approach for Improving the Quality and Intelligibility of Deep Neural Network Enhanced Speech 1134
Babafemi O. Odelowo (Georgia Institute of Technology) and David V. Anderson (Georgia Institute of Technology)

Feature Extraction and K-means Clustering Approach to Explore Important Features of Urban Identity 1139
Mei-Chih Chang (Chair of Information Architecture ETH Zürich), Peter Bus (Chair of Information Architecture ETH Zürich), and Gerhard Schmitt (Chair of Information Architecture ETH Zürich)

Applying Reinforcement Learning and Supervised Learning Techniques to Play Hearthstone 1145
Ilya Kachalsky (ITMO University), Ilya Zakirzyanov (ITMO University), and Vladimir Ulyantsev (ITMO University)

Semi-Automated Segmentation of Glioblastomas in Brain MRI Using Machine Learning Techniques 1149
Naomi Joseph (National University of Singapore Singapore), Parita Sanghani (National University of Singapore Singapore), and Hongliang Ren (National University of Singapore Singapore)

Author Index