# 2020 International Conference on INnovations in Intelligent SysTems and Applications (INISTA 2020)

Novi Sad, Serbia 24 – 26 August 2020



IEEE Catalog Number: ISBN: CFP2072N-POD 978-1-7281-6800-5

# Copyright © 2020 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:	CFP2072N-POD
ISBN (Print-On-Demand):	978-1-7281-6800-5
ISBN (Online):	978-1-7281-6799-2

#### 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



# TABLE OF CONTENTS

#### **Applications of deep learning**

Mohammad Amaz Uddin, Md Sayem Hossain, Refat Khan Pathan, Munmun Biswas, Gender Recognition from Human Voice using Multi-Layer Architecture	1
Tobias Wagner, Sara Sommer, <i>Bearing fault detection using deep neural network and weighted ensemble learning for multiple motor phase current sources</i>	8
Zeynep Hilal Kilimci, Hasan Yoruk, Selim Akyokus, Sentiment Analysis Based Churn Prediction in Mobile Games using Word Embedding Models and Deep Learning Algorithms	15
Veljko Petrovic, Gorana Gojic, Dinu Dragan, Dusan Gajic, Nebojsa Horvat, Radovan Turovic, Ana Oros, Robustness of Deep Learning Methods for Ocular Fundus Segmentation: Evaluation of Blur Sensitivity	22

## Algorithms and theoretical analyses

Amelia Badica, Costin Badica, Ion Buligiu, Liviu Ion Ciora, Felix Petcusin, <i>Quantifying Blocks World State Space</i>	29
Daniele Di Sarli, Claudio Gallicchio, Alessio Micheli, Gated Echo State Networks: a preliminary study	36
Claudio Gallicchio, Sparsity in Reservoir Computing Neural Networks	41
Sandeepak Bhandari, Vacius Jusas, The Phases Based Approach for Regeneration of Timeline in Digital Forensics	48

## Intelligent techniques in medical domains

Industrial Datasets

Simona Nedelcheva, Krasimira Georgieva, Petia Koprinkova-Hristova, Parallel Implementation of the Model of Retina Ganglion Cells Layer	54
Milana Grbic, Vukasin Crnogorac, Milan Predojevic, Aleksandar Kartelj, Dragan Matic, How well are known protein complexes supported in PPI networks?	60
Yan Kang, Wenbo Xu, Yan Zhu, Fang Xie, Shuangshuang Dai, Weihui Dai, Intelligent Analysis for Improving The Clinical Pathway of Lung Cancer	67
Cincar Kristijan, Sima Ioan, Machine Learning algorithms approach for Gastro-Intestinal Polyps classification	72
Armando Collado-Villaverde, Mario Cobos, Pablo Muñoz, Maria D. R-Moreno, Fall simulator for supporting supervised Machine Learning techniques in wearable devices	78
Smart and IoT systems	
Krisztian Buza, Aleksandra Revina, Speeding up the SUCCESS Approach for Massive	85

Yuan-Chih Yu, An Urban Intelligence Service for the impact of urbanization on National Park	91
Renato Soic, Marin Vukovic, Gordan Jezic, Speech Controlled IoT System Based on Context-Driven Rule Engine	96
Hasan Seckin Efendioglu, Ulas Asık, Canturk Karadeniz, Identification of Computer Displays Through Their Electromagnetic Emissions Using Support Vector Machines	103
Lazar Mrkela, Zorica Stanimirovic, A bi-objective maximal covering location problem: a service network design application	108

# Natural language processing and text mining

Abdul Wahab Qurashi, Violeta Holmes, Anju P. Johnson, <i>Document Processing: Methods</i> for Semantic Text Similarity Analysis	115
Omer Koksal, Tuning Turkish Text Classification Using Supervised Machine Learning- based Algorithms	121
Abdullah Al Nahas, Aysenur Kulunk, Burak Gozutok, Soner Can Kalkan, Hakki Yagiz Erdinc, How to Segment Turkish Words for Neural Text Classification?	128
Bernardo Leite, Henrique Lopes Cardoso, Luís Paulo Reis, Carlos Soares, Factual Question Generation for the Portuguese Language	133
Kareem Amin, Stelios Kapetanakis, Nikolaos Polatidis, Klaus-Dieter Althoff, Andreas Dengel, <i>DeepKAF: A Heterogeneous CBR &amp; Deep Learning Approach for NLP Prototyping</i>	140

#### Security and privacy in modern systems

Igor Parashchuk, Elena Doynikova, Igor Saenko, Igor Kotenko, Selection of147Countermeasures against Harmful Information based on the Assessment of Semantic147Content of Information Objects in the Conditions of Uncertainty147	1
Georgios Spanos, Konstantinos M. Giannoutakis, Konstantinos Votis, Brais Viano, Javier Augusto-Gonzalez, Georgios Aivatoglou, Dimitrios Tzovaras, <i>A Lightweight Cyber-</i> <i>Security Defense Framework for Smart Homes</i>	ł
Zumrut Muftuoglu, Merve Ayyuce Kizrak, Tulay Yildirim, <i>Differential Privacy Practice on</i> 161 Diagnosis of COVID-19 Radiology Imaging Using EfficientNet	l
Ibrahim Karsu, Tulay Yildirim, Split Feature Model for Adversarial Conditions167	7
Merton Lansley, Stelios Kapetanakis, Nikolaos Polatidis, <i>SEADer++ v2: Detecting Social</i> <i>Engineering Attacks using Natural Language Processing and Machine Learning</i>	ł

# Contemporary intelligent techniques in robotics

Simge Nur Aslan, Recep Ozalp, Aysegul Ucar, Cuneyt Guzelis, End-To-End Learning from Demonstration for Object Manipulation of Robotis-Op3 Humanoid Robot	180
Hasan Kivrak, Furkan Cakmak, Hatice Kose, Sirma Yavuz, A multilevel mapping based pedestrian model for social robot navigation tasks in unknown human environments	186

Sajjad Nematzadeh Miandoab, Farzad Kiani, Erkan Uslu, Generation of Automatic Six- Legged Walking Behavior Using Genetic Algorithms	193
Yesim Baysal, Ismail Hakkı Altas, <i>OPTIMALLY EFFICIENT LOCOMOTION OF SNAKE</i> ROBOT	198
Aysegul Ucar, Simge Nur Aslan, Cuneyt Guzelis, Fast Object Recognition for Humanoid Robots by Using Deep Learning Models with Small Structure	204
Advanced software engineering techniques	
Kristijan Kuk, Petar Milic, Stefan Denic, Object-oriented software metrics in software code vulnerability analysis	211
Verislav Djukic, Evolution from Modeling by Means of Function Block Diagrams to Domain-specific Modeling in Automation	217
Vassiliki Gkantouna, Vaios Papaioannou, Giannis Tzimas, Zlatan Sabic, A Semantic Approach for Domain-Specific Design Patterns Recommendations in CMS-based Web Development	225
Sasa Pesic, Milos Radovanovic, Mirjana Ivanovic, An MQTT-based Resource Management Framework for Edge Computing Systems	231
Drazen Brdjanin, Dragana Vukovic, Goran Banjac, Aleksandar Kelec, Igor Dujlovic, Nikola Obradovic, Danijela Banjac, <i>REDBUL: An Online System for Reverse Engineering of Relational Databases</i>	238
Drazen Brdjanin, Aleksandar Vukotic, Goran Banjac, Danijela Banjac and Slavko Maric, Automatic Derivation of Conceptual Database Model from a Set of Business Process Models	244
Machine learning in contemporary research	
Huyen Trang Phan, Dai Tho Dang, Ngoc-Thanh Nguyen, Dosam Hwang, A New Approach for Predicting an Important User on a Topic on Twitter	252

Zoltan Geler, Vladimir Kurbalija, Mirjana Ivanovic, Milos Radovanovic, Time-Series	258
Classification with Constrained DTW Distance and Inverse-Square Weighted k-NN	

Jelena Graovac, Marija Radovic, Berna Altınel Girgin, *ML-SPD: Machine Learning based* 265 Sentiment Polarity Detection

Dusica Knezevic, Milos Savic, Analysis of scientific fields using journal citation networks: 272 An empirical study

Salmi Cheikh, Bouchema Sara, Zaoui Sara, *A Hybrid Heuristic Community Detection* 279 *Approach* 

Sandro Radovanovic, Andrija Petrovic, Boris Delibasic, Milija Suknovic, Enforcing286fairness in logistic regression algorithm286

#### Computer vision and image processing

Veljko Aleksic, Dionysios Politis, The Characteristics of Virtual Reality Usage in	293
Educational Systems	

Adnan Brdjanin, Nadja Dardagan, Dzemil Dzigal, Amila Akagic, Single Object Tracking in OpenCV: A Benchmark	298
Hanife Guney, Melek Aydın, Murat Taskıran, Nihan Kahraman, Toddler Tracking System with Face Recognition and Object Tracking Using Deep Neural Network	304
Soner Can Kalkan, Burak Gozutok, Abdullah Al Nahas, Aysenur Kulunk, Hakkı Yagız Erdinc, Image Enhancement Effects On Adult Content Classification	310
Salih Sarp, Murat Kuzlu, Mecit Cetin, Cem Sazara, Ozgur Guler, Detecting Floodwater on Roadways from Image Data Using Mask-R-CNN	316
Grega Vrbancic, Spela Pecnik, Vili Podgorelec, Identification of COVID-19 X-ray Images using CNN with Optimized Tuning of Transfer Learning	322