2021 Second International Conference on Intelligent Data Science Technologies and Applications (IDSTA 2021)

Tartu, Estonia 15 – 17 November 2021



IEEE Catalog Number: CFP21Y20-POD

ISBN: 978-1-6654-2181-2

Copyright © 2021 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:
 CFP21Y20-POD

 ISBN (Print-On-Demand):
 978-1-6654-2181-2

 ISBN (Online):
 978-1-6654-2180-5

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Phone: (845) 758-0400 Fax: (845) 758-2633

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



Table of Contents

Keynote Speeches	
Keynote 1: Leveraging Cloud and Fog Computing for Real-Time Applications: Resource	1
Allocation and Scheduling Issues	
Professor Helen D. Karatza, Aristotle University of Thessaloniki, Greece	
Keynote 2: Extending the Data Science pipeline: Integrating Machine Learning into Edge	2
Environments	
Professor Omer F. Rana, School of Computer Science and Informatics, Cardiff University, UK	
Keynote 3: 6G – The Journey Towards a New Breeze of Cloud-Native Mobile Networking	3
Professor Tarik Taleb, Communications and Networking Department, School of Electrical	
Engineering, Aalto University, Finland	
Industrial Talk: Machine Learning at Scale	4
Dr. Srijith Rajamohan, Senior Data Science Advocate, Databricks, USA	
IDSTA2021	
SiloSolver: Algorithm for Aggregating Siloed Customer Segments in Facebook Ads Campaigns	
Joni Salminen, Tommi Salenius, Bernard Jansen	
Predicting Individual Actions from Aggregate User Behaviors	11
Bernard Jansen, Soon-Gyo Jung, Joni Salminen	
Performance Comparison of Several Deep Learning-Based Object Detection Algorithms	16
Utilizing Thermal Images	
Yousef Sharrab, Sana'a Al-Shboul, Mohammad Alsmirat, Alaa Khalifah, Zyad Dwekat, Izzat	
Alsmadi, Ahmad Al-Khasawneh	
Extreme learning machine with confidence interval based bias initialization	23
Audi Issa Mohammad Al-Btoush, Manuel Fernández-Delgado, Eva Cernadas, Senén Barro	
Material and Cost estimation of a Customized Product based on the Customer's description	31
Kevin Baboolal, Patrick Hosein	
ShoBeVODSDT: Shodan and Binary Edge based vulnerable open data sources detection tool or	38
what Internet of Things Search Engines know about you	
Anastasija Nikiforova, Artjoms Daskevics	
Impact of Running Dynamic/Static Scans on the Performance of an App Running in a GKE	46
Clusters	
Malek Athamnah, Mohamed Fazil Hussain, Salwa Sayeedul Hasan	
Method for Analyzing Interactions in Pedagogical Environments Using Environmental Sound	54
Analysis	
Mitsuru Kawamoto, Akio Sashima	
Marketing Channel Recommendations in Banking	60
Aqeel Mohammed, Karesia Ramlal, Patrick Hosein, Nigel Henry	
Stakeholder-centered Identification of Data Quality Issues: Knowledge that Can Save Your	66
Business	
Anastasija Nikiforova, Natalija Kozmina	
A Decision Tree Approach to Customer Surveys	74
Rafael Guerrero, Navin Dookeram, Patrick Hosein	
Estimating Deforestation using Machine Learning Algorithms	82
Keanu Nichols, Patrick Hosein	
Using Recurrent Neural Networks to approximate orientation with Accelerometers and	88
Magnetometers	
Akil Hosang, Nicholas Hosein, Patrick Hosein	
A Hybrid Deep Learning Model for Emotion Detection in Emotion-sensitive Robo-advisors	93
Wenda He, Raymond Y.K. Lau	

Toward Smart Internet of Things (IoT) for Apparel Retail Industry: Automatic Customer's	99
Body Measurements and Size Recommendation System using Computer Vision Techniques	
Sherin Aly, Abdallah Abdallah, Sandra Sherif, Adel Atef, Rimon Adel, Mohammed Hatem	
Using Transfer Learning in Building Federated Learning Models on Edge Devices	105
Jordan Suzuki, Saba Lameh, Yasaman Amannejad	
Hybrid Dynamic Scheduling of MapReduce and Spark Services Based on the Profit Model in	114
the Cloud Computing Platform	
Jing Hu	
Exploring Ranked Local Selectors for Stable Explanations of ML Models	122
Johan Garcia, Topi Korhonen	
Estimating tropical forest stand volume using Sentinel-2A image	130
Huong Thi Thanh Nguyen, Quynh Thi Nhu Chau, Dinh Duc Nguyen, Hoai Thi Cao, Hang Thi Phan,	
Bao Dinh Ho, Son The Ngo, Dan Quang Le, Anh Tuan Pham	
Clustering and Network Analysis for the Embedding Spaces of Sentences and Sub-Sentences	138
Yuan An, Alex Kalinowski, Jane Greenberg	
Using Machine Learning for malware traffic prediction in IoT networks	146
Jayant Singh Bains, Hemanth Varma Kopanati, Rahul Goyal, Bhargav Krishna Savaram, Sergey	
Butakov	
Hybrid scatter and ant search feature subset selection: applications in classification problems	150
Antonio J. Tallón-Ballesteros, Luís Correia, Simon Fong	
Towards a Learning-enabled Virtual Sensor Forensic Architecture Compliant with Edge	154
Intelligence	
Victor R. Kebande, Feras M. Awaysheh, Richard Adeyemi Ikuesan, Sadi Alawadi	
Arabic Question Answering System for Information Retrieval on large-scale Image Objects	162
Sawsan Al-Zubi, Feras M. Awaysheh, Bashar Awad Al-Shboul	
Detecting Arabic Fake News Using Machine Learning	171
Ashwaq Khalil, Moath Jarrah, Monther Aldwairi, Yaser Jararweh	