

# **2020 IEEE 16th International Conference on Intelligent Computer Communication and Processing (ICCP 2020)**

**Cluj-Napoca, Romania  
3 – 5 September 2020**



**IEEE Catalog Number: CFP2009D-POD  
ISBN: 978-1-7281-9081-5**

**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:	CFP2009D-POD
ISBN (Print-On-Demand):	978-1-7281-9081-5
ISBN (Online):	978-1-7281-9080-8

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Table of Contents

Foreword	vii
Keynote Lecture - Knorr Moritz	ix
Keynote Lecture - Daniela Rus	x
Keynote Lecture - Doina Precup	xi
Part I: Intelligent Systems	1
<b>Intelligent Systems: Fuzzy Reasoning and Brain Signal Classification</b>	<b>3</b>
<b>Integration of Fuzzy Logic in Analogical Reasoning: A Prototype</b>	
<i>Moreno Colombo, Sara D’Onofrio, Edy Portmann</i>	5
<b>Data-Based Technique for Extracting Knowledge from Data Generated in Experiments</b>	
<i>Sergiu Zaporozjan, Viorel Carbune, Igor Calmicov</i>	13
<b>Using Symbolic Analysis of Local Field Potentials for Anesthesia Depth Prediction</b>	
<i>Ioana Onofrei, Andreea Sălăgean, Narcisa Sîrca, Vasile Vlad Moca, Adriana Nagy-Dabacan, Raul C. Mureşan, Rodica Potolea, Camelia Lemnaru, Mihaela Dinsoreanu</i>	21
<b>Enhancing the Classification of EEG Signals using Wasserstein Generative Adversarial Networks</b>	
<i>Vlad Mihai Petrutiu, Liana-Daniela Palcu, Camelia Lemnaru, Mihaela Dinsoreanu, Rodica Potolea, Raul C. Mureşan, Vasile Vlad Moca</i>	29
<b>Intelligent Systems: Intelligence in Software Projects</b>	<b>35</b>
<b>The Impact of Punishment Postponement on the Evolution of Honest Behavior</b>	
<i>Emil Bucur</i>	37
<b>Enhancing Scientific Collaborations using Community Detection and Document Clustering</b>	
<i>Iulia-Maria Rădulescu, Ciprian-Octavian Truică, Elena-Simona Apostol, Ciprian Dobre</i>	43
<b>Interactive call graph generation for software projects</b>	
<i>István-Attila Császár, Radu Razvan Slavescu</i>	51
<b>Predicting Structure &amp; Clarity of software projects with Machine Learning</b>	
<i>Darius Mihnea Bogdan, Anca Marginean</i>	59
<b>Intelligent Systems: Natural Language Processing</b>	<b>67</b>
<b>Speech Emotion Recognition method using time-stretching in the Preprocessing Phase and Artificial Neural Network Classifiers</b>	
<i>Valentin Cătălin Govoreanu, Mihai Neghină</i>	69
<b>Sentiment Analysis using Topic-Document Embeddings</b>	
<i>Mădălina Mitroi, Ciprian-Octavian Truică, Elena-Simona Apostol, Adina Magda Florea</i>	75
<b>Concept Identification with Sequence-to-Sequence Models in Abstract Meaning Representation Parsing</b>	
<i>Orsolya Bernadett Batiz, Robert Paul Helmer, Roxana Pop, Florin Macicasan, Camelia Lemnaru</i>	83
<b>A Two Stage Approach for AMR Parsing Using the Concept Inference Order</b>	
<i>Roxana Pop, Florin Macicasan, Camelia Lemnaru</i>	91

<b>Intelligent Systems: System Optimization</b>	<b>99</b>
<b>Automated Machine Learning using Evolutionary Algorithms</b>	
<i>Mihai Anton</i> . . . . .	101
<b>COVID-19 Preliminary Patient Filtering based on Regular Blood Tests using Auto-Adaptive Artificial Intelligence Platform</b>	
<i>Zoltan Czako, Gheorghe Sebestyen, Anca Hangan</i> . . . . .	109
<b>COVID-19 spread forecast using recurrent auto-encoders</b>	
<i>Radu Beche, Romina Băilă, Anca Marginean</i> . . . . .	117
<b>Optimising the pool test method for COVID-19 using evolutionary algorithms</b>	
<i>Cristian Lungu, Rodica Potolea</i> . . . . .	123
<b>Intelligent Systems: Knowledge and Rule Based Systems</b>	<b>129</b>
<b>A decision support system for B2B CRM Systems using belief rules</b>	
<i>Doru Rotovei, Daniela Zaharie, Viorel Negru, Daniel Pop</i> . . . . .	131
<b>onIQ: An Ontology-Independent Natural Language Interface for Building SPARQL Queries</b>	
<i>Ilie Cristian Dorobăț, Vlad Posea</i> . . . . .	139
<b>Fake news detector in the medical domain by reasoning with description logics</b>	
<i>Adrian Groza, Ana-Diana Pop</i> . . . . .	145
<b>MineFOL: a Game for Learning First Order Logic</b>	
<i>Adrian Groza, Maria Monalisa Baltatescu, Mihai Pomarlan</i> . . . . .	153
<b>Intelligent Systems: Applications 1</b>	<b>161</b>
<b>Detecting Injection Attacks using Long Short Term Memory</b>	
<i>Ioana-Crinela Potinteu, Robert Varga</i> . . . . .	163
<b>Towards Pentesting Automation Using the Metasploit Framework</b>	
<i>Ovidiu Valea, Ciprian Opreșă</i> . . . . .	171
<b>Privacy Oriented Ecosystem Comparable to Googles Ecosystem</b>	
<i>Emanuel Truța, Alin Suciu</i> . . . . .	179
<b>Detecting Malicious URLs Based on Machine Learning Algorithms and Word Embeddings</b>	
<i>Andrei Crișan, Gabriel Florea, Lorand Halasz, Camelia Lemnaru, Ciprian Opreșă</i> . . . . .	187
<b>Intelligent Systems: Applications 2</b>	<b>195</b>
<b>Evaluation of Deep Learning architectures for System Identification. Applications for a household heating system</b>	
<i>Cristian Vicas</i> . . . . .	197
<b>Human Activity Recognition using Smartphone Sensors and Beacon-based Indoor Localization for Ambient Assisted Living Systems</b>	
<i>Andreea Valeria Vesa, Simion Vlad, Renato Rus, Marcel Antal, Claudia Pop, Ionut Anghel, Tudor Cioara, Ioan Salomie</i> . . . . .	205
<b>A System for Managing and Processing Industrial Sensor Data: SMS</b>	
<i>Codrin-Mihai Chira, Raluca Portase, Ramona Tolas, Camelia Lemnaru, Rodica Potolea</i> . . . . .	213
<b>Modern approaches to preprocessing industrial data</b>	
<i>Eliza Maria Olariu, Ramona Tolas, Raluca Portase, Mihaela Dinsoreanu, Rodica Potolea</i> . . . . .	221
<b>Intelligent Systems: Learning</b>	<b>227</b>
<b>Conformal transformation of the metric for k-nearest neighbors classification</b>	
<i>Marius Claudiu Popescu, Lacrimioara Grama, Corneliu Rusu</i> . . . . .	229
<b>A Graph-Based Model for Combinatorial Auctions</b>	
<i>Paul Diac</i> . . . . .	235
<b>Enhancing Tokenization by Embedding Romanian Language Specific Morphology</b>	
<i>Mihaela Alexandra Vasii, Rodica Potolea</i> . . . . .	243
<b>Round Based Extension Algorithm for Gossip Learning</b>	
<i>Szabolcs-Márton Bagoly, Radu Danescu</i> . . . . .	251

<b>Part II: Computer Vision</b>	<b>259</b>
<b>Computer Vision: Autonomous Driving 1</b>	<b>261</b>
<b>Driver Assistance for Safe and Comfortable On-Ramp Merging Using Environment Models Extended through V2X Communication and Role-Based Behavior Predictions</b>	
<i>Lucas Eiermann, Florian Wirthmüller, Kay Massow, Gabi Breuel, Ilja Radusch</i>	263
<b>V2X-supported automated driving in modern 4G networks</b>	
<i>Pasi Pyykönen, Aki Lumiaho, Matti Kutila, Johan Scholliers, Geerd Kakes</i>	271
<b>A Comparison Study on Replacing Stereo Disparity with LiDAR in Visual Odometry Methods</b>	
<i>Catalin Golban, Petrut Cobarzan, Sergiu Nedevschi</i>	277
<b>PartID Individual Objects Tracking in Occupancy Grids Using Particle Identities</b>	
<i>Radu Danescu, Razvan Itu, Mircea Paul Muresan</i>	283
<b>Computer Vision: Autonomous Driving 2</b>	<b>291</b>
<b>Semantic 3D Obstacle Detection Using an Enhanced Probabilistic Voxel Octree Representation</b>	
<i>Sorana Baciu, Florin Oniga, Sergiu Nedevschi</i>	293
<b>Trajectory Based Motion Planning for On-Ramp Merging-Situations Considering Extended Evaluation Criteria</b>	
<i>Lucas Eiermann, Nick Bühner, Gabi Breuel, Ilja Radusch, Manfred Hauswirth</i>	299
<b>Feasibility Study for an Automatic Architecture for Pothole Detection in Asphalt Images: a Trade-off between Performance and Quality</b>	
<i>Leonardo de Abreu Schmidt, Marcia Pasin, Sarajane Peres</i>	307
<b>Autonomous Driving Architectures, Perception and Data Fusion: A Review</b>	
<i>Gustavo Velasco-Hernandez, De Jong Yeong, John Barry, Joseph Walsh</i>	315
<b>Computer Vision: Deep Learning Based Perception for Autonomous Systems - 1</b>	<b>323</b>
<b>MONet - Multiple Output Network for Driver Assistance Systems Based on a Monocular Camera</b>	
<i>Razvan Itu, Radu Danescu</i>	325
<b>Detecting Highway Code Violations using Artificial Intelligence</b>	
<i>Owen Xuereb, Frankie Inguanez, Thomas Gatt</i>	331
<b>Autonomous motor vehicle categorisation using a convolutional neural network</b>	
<i>Christian Paul Cassar, Thomas Gatt, Ivan Briffa</i>	337
<b>Detecting road potholes using computer vision techniques</b>	
<i>Neil Camilleri, Thomas Gatt</i>	343
<b>Computer Vision: Deep Learning Based Perception for Autonomous Systems - 2</b>	<b>351</b>
<b>A Critical Evaluation of Aerial Datasets for Semantic Segmentation</b>	
<i>Bianca-Cerasela-Zelia Blaga, Sergiu Nedevschi</i>	353
<b>Narrowing the semantic gap between real and synthetic data</b>	
<i>Radu Beche, Sergiu Nedevschi</i>	361
<b>Video Semantic Segmentation leveraging Dense Optical Flow</b>	
<i>Vasile Lup, Sergiu Nedevschi</i>	369
<b>Efficient spatio-temporal point convolution</b>	
<i>Bogdan Maxim, Sergiu Nedevschi</i>	377
<b>Computer Vision: Technologies and Applications - 1</b>	<b>383</b>
<b>Improving the Accuracy of Deep Neural Networks Through Developing New Activation Functions</b>	
<i>Marina Adriana Mercioni, Angel Marcel Tat, Stefan Holban</i>	385
<b>Shape and Contrast Adaptive Non-local Means Filter</b>	
<i>Claudiu Bic, Romulus Terebes, Raul Malutan</i>	393
<b>Face Retrieval in Videos using Face Quality Assessment and Convolution Neural Networks</b>	
<i>Rahma Abed, Sahbi Bahroun, Ezzeddine Zagrouba</i>	399
<b>Driver Drowsiness Detection Based on Joint Monitoring of Yawning, Blinking and Nodding</b>	
<i>Aicha Ghourabi, Haythem Ghazouani, Walid Barhoumi</i>	407

<b>Computer Vision: Technologies and Applications - 2</b>	<b>415</b>
<b>A Comparison of Deep Learning Models for Pallet Detection in Industrial Warehouses</b>	
<i>Michela Zaccaria, Riccardo Monica, Jacopo Aleotti</i> . . . . .	417
<b>Automatic Vision Inspection Solution for the Manufacturing Process of Automotive Components Through Plastic Injection Molding</b>	
<i>Mircea Paul Muresan, Dragos Gabriel Cireap, Ion Giosan</i> . . . . .	423
<b>Single-Ray LiDAR-based Scanner for Static Scenes Dense 3D Reconstruction</b>	
<i>Bogdan Mesesan, Ramona Voichita Galatus, Tiberiu Marita</i> . . . . .	431
<b>Intersection Management Systems and Internet of Things: A Review</b>	
<i>Gustavo Velasco-Hernandez, Eduardo Caicedo-Bravo, John Barry, Joseph Walsh</i> . . . . .	439
<b>Computer Vision: Medical Imaging</b>	<b>447</b>
<b>Adversarial Graph Learning and Deep Learning Techniques for improving diagnosis within CT and Ultrasound images</b>	
<i>Dan-Sebastian Bacea, Delia-Alexandrina Mitrea, Sergiu Nedeveschi, Radu Badea</i> . . . . .	449
<b>Teeth Detection and Dental Problem Classification in Panoramic X-Ray Images using Deep Learning and Image Processing Techniques</b>	
<i>Mircea Paul Muresan, Andrei Răzvan Barbura, Sergiu Nedeveschi</i> . . . . .	457
<b>3D Texture Feature Extraction and Classification using the BM3DELBP approach</b>	
<i>Stefania Barburiceanu, Romulus Terebes, Serban Meza</i> . . . . .	465
<b>A Two Step Approach for Joint Detection</b>	
<i>Irina Maria Sandu, Irina Mocanu, Lucia Rusu</i> . . . . .	473
<b>Part III: Distributed Computing and Networking</b>	<b>481</b>
<b>Distributed Computing And Networking: Blockchain Applications</b>	<b>483</b>
<b>Transactional Data Analytics for Inferring Behavioural Traits in Ethereum Blockchain Network</b>	
<i>M S Bhargavi, Sushmitha M Katti, M Shilpa, Vaishnavi P Kulkarni, Supraja Prasad</i> . . . . .	485
<b>An Ethereum-based implementation of English, Dutch and First-price sealed-bid auctions</b>	
<i>Claudia Pop, Mirela Prata, Marcel Antal, Tudor Cioara, Ionut Anghel, Ioan Salomie</i> . . . . .	491
<b>A Hyperledger integration for audit-enhanced decision support in a smart water distribution system</b>	
<i>Diana Arsene, Bogdan Pahonțu, Alexandru Predescu, Mariana Mocanu, Ciprian Lupu</i> . . . . .	499
<b>A Blockchain based solution for Managing Transplant Waiting Lists and Medical Records</b>	
<i>Ioana Andreea Daniel, Claudia Pop, Ionut Anghel, Marcel Antal, Tudor Cioara</i> . . . . .	505
<b>Distributed Computing And Networking: Systems Quality and Safety</b>	<b>511</b>
<b>LOKI: A Lightweight Cryptographic Key Distribution Protocol for Controller Area Networks</b>	
<i>Teri Lenard, Roland Bolboacă, Béla Genge</i> . . . . .	513
<b>Metric Semantics for Concurrent Languages Designed in Continuation-Passing Style</b>	
<i>Eneia Nicolae Todoran</i> . . . . .	521
<b>The Quality of Programs Conceived by Object Enhanced Time Petri Nets</b>	
<i>Dahlia Al-Janabi, Mihai Florian Enache, Tiberiu Stefan Letia</i> . . . . .	529
<b>A Physiotherapy Coaching System based on Kinect Sensor</b>	
<i>Timeea Sărătean, Marcel Antal, Claudia Pop, Tudor Cioara, Ionut Anghel, Ioan Salomie</i> . . . . .	535
<b>HiPerGRID: Modern Streaming and Infrastructure</b>	<b>541</b>
<b>A New Prefetching Scheme Based on Remote Control Inputs for Random Channel Change in IPTV Multicast Service</b>	
<i>Hyunchul Joo, Intai Kim, Kyungchul Kwak, Dai-Boong Lee</i> . . . . .	543
<b>FreeBSD as a compute node in OpenStack</b>	
<i>Andreea Mitran, Maria-Elena Mihăilescu, Darius Mihai, Sergiu Weisz, Mihai Carabaș, Nicolae Tăpuș</i> . . . . .	547
<b>RenderLink remote rendering platform for computer games. A WebRTC solution for streaming computer games</b>	
<i>Bogdan-Ioan Oros, Victor Ioan Bâcu</i> . . . . .	555

<b>Particle Swarm Optimization Based Deep Learning Ensemble for Manufacturing Processes</b>	
<i>Dorin Moldovan, Ionut Anghel, Tudor Cioara, Ioan Salomie</i>	563
<b>HiPerGRID: Satellite Data Processing</b>	<b>571</b>
<b>Landscape Change Monitoring using Satellite Data and Open Data Cube Platform</b>	
<i>Cătălin-Mihai Vâjâială-Tomici, Ion-Dorinel Filip, Florin Pop</i>	573
<b>Exploration of a Visual Technique in Asteroids Detection Process</b>	
<i>Denisa Copandean, Dorian Gorgan</i>	581
<b>Qualitative Classification of Local Satellite Data</b>	
<i>Razvan Cristian Margin, Dorian Gorgan</i>	589
<b>A Multi-threaded Particle-in-cell Approach for Kinetic Plasma Simulations</b>	
<i>Marius Joldos, Gabriel Voitcu, Alin Suci, Anca Hangan, Marius Echim, Anca Marginean</i>	597
<b>Development and Research on CLOUDUT Infrastructure</b>	
<i>Dorian Gorgan, Sergiu Nedevschi</i>	603
<b>Index</b>	<b>613</b>