

2018 IEEE International Conference on Edge Computing (EDGE 2018)

**San Francisco, California, USA
2-7 July 2018**



**IEEE Catalog Number: CFP18L50-POD
ISBN: 978-1-5386-7239-6**

**Copyright © 2018 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:	CFP18L50-POD
ISBN (Print-On-Demand):	978-1-5386-7239-6
ISBN (Online):	978-1-5386-7238-9

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

CURRAN ASSOCIATES INC.
proceedings
.com

2018 IEEE International Conference on Edge Computing **EDGE 2018**

Table of Contents

Message from the IEEE EDGE 2018 Chairs	ix
IEEE EDGE 2018 Organizing Committee	x
IEEE EDGE 2018 Reviewers	xi

Regular Papers

Session 1: Platforms and Infrastructure for Edge Computing

Docker Container Deployment in Fog Computing Infrastructures	1
<i>Arif Ahmed (Univ Rennes, Inria, CNRS, IRISA) and Guillaume Pierre (Univ Rennes, Inria, CNRS, IRISA)</i>	
Fog at the Edge: Experiences Building an Edge Computing Platform	9
<i>Nam Ky Giang (University of British Columbia), Rodger Lea (Lancaster University), Michael Blackstock (Sense Tecnic System Inc.), and Victor C.M. Leung (University of British Columbia)</i>	
Semi-Autonomous Industrial Robotic Inspection: Remote Methane Detection in Oilfield	17
<i>Roberto Silva Filho (General Electric Global Research Center), Ching-Ling Huang (General Electric Global Research Center), Bo Yu (General Electric Global Research Center), Raju Venkataramana (General Electric Global Research Center), Ashraf El-Messidi (Baker Hughes, a GE Company), Dustin Sharber (Baker Hughes, a GE Company), John Westerheide (Baker Hughes, a GE Company), and Nasr Alkadi (Baker Hughes, a GE Company)</i>	

Session 2: Data Processing at Edge

Data Distillation at the Network's Edge: Exposing Programmable Logic with InLocus	25
<i>Lucas R.B. Brasilino (Indiana University), Alexander Shroyer (Indiana University), Naveen Marri (Indiana University), Saurabh Agrawal (Indiana University), Catherine Pilachowski (Indiana University), Ezra Kissel (Indiana University), and Martin Swany (Indiana University)</i>	
Optimizing Windowed Aggregation over Geo-Distributed Data Streams	33
<i>Hooman Peiro Sajjad (KTH Royal Institute of Technology, Stockholm), Ying Liu (Stockholm University), and Vladimir Vlassov (KTH Royal Institute of Technology, Stockholm)</i>	

Are Existing Knowledge Transfer Techniques Effective for Deep Learning with Edge Devices? .42.....
Ragini Sharma (Arizona State University), Saman Biokaghazadeh (Arizona State University), Baoxin Li (Arizona State University), and Ming Zhao (Arizona State University)

Session 3: Resource Allocation and Energy Awareness

Towards Mission-Critical Control at the Edge and Over 5G .50.....
Per Skarin (Ericsson and Lund University), William Tärneberg (Lund University), Karl-Erik Årzen (Lund University), and Maria Kihl (Lund University)

An Energy-Aware IoT Femtocloud System .58.....
Hend Gedawy (Hamad Bin Khalifa University), Karim Habak (Georgia Institute of Technology), Khaled Harras (Carnegie Mellon University), and Mounir Hamdi (Hamad Bin Khalifa University)

An Energy-Aware Edge Server Placement Algorithm in Mobile Edge Computing .66.....
Yuanzhe Li (State Key Laboratory of Networking and Switching Technology) and Shangguang Wang (State Key Laboratory of Networking and Switching Technology)

Workshop Papers

Session 1: Edge Cooperation

Cooperative Computation Offloading for UAVs: A Joint Radio and Computing Resource Allocation Approach .74.....
Shichao Zhu (Shanghai Jiao Tong University), Lin Gui (Shanghai Jiao Tong University), Jiacheng Chen (Shanghai Jiao Tong University), Qi Zhang (Shanghai Jiao Tong University), and Ning Zhang (Texas A&M University-Corpus Christi)

ECSim++: An INET-Based Simulation Tool for Modeling and Control in Edge Cloud Computing .80.....
Tien-Dung Nguyen (Kyung Hee University) and Eui-Nam Huh (Kyung Hee University)

Cross-Domain Based Data Sharing Scheme in Cooperative Edge Computing .87.....
Kai Fan (Xidian University), Qiang Pan (Xidian University), Junxiong Wang (Xidian University), Tingting Liu (Xidian University), Hui Li (Xidian University), and Yintang Yang (Xidian University)

Session 2: Emerging Edge Techniques and Applications

Edge-Centric Efficient Regression Analytics .93.....
Natascha Harth (University of Glasgow) and Christos Anagnostopoulos (University of Glasgow)

EDGESTORE: A Single Namespace and Resource-Aware Federation File System for Edge Servers
101

Awais Khan (Sogang University, Seoul), Attique Muhammad (Sogang University, Seoul), Youngjae Kim (Sogang University, Seoul), Sungyong Park (Sogang University, Seoul), and Byungchul Tak (Kyungpook National University, Daegu)

Enterprise Scale Privacy Aware Occupancy Sensing .109.....
Surya Shravan Kumar Sajja (IBM Research India), Ashok Pon Kumar Sree Prakash (IBM Research India), Rohun Tripathi (IBM Research India), Satyam Dwivedi (IBM Research India), Amith Singhee (IBM Research India), and Marnik Vermeulen (IBM India)

Work-in-Progress Papers

Session 1: Current Trends in Edge Computing

Towards Edge Computing over Named Data Networking .117.....
Abderrahmen Mtibaa (New Mexico State University), Reza Tourani (New Mexico State University), Satyajayant Misra (New Mexico State University), Jeff Burke (University of California, Los Angeles), and Lixia Zhang (University of California, Los Angeles)

SaRa: A Stochastic Model to Estimate Reliability of Edge Resources in Volunteer Cloud .121.....
Yousef Alsenani (Southern Illinois University Carbondale), Garth Crosby (Southern Illinois University Carbondale), and Tomas Velasco (Southern Illinois University Carbondale)

Real-Time Human Detection as an Edge Service Enabled by a Lightweight CNN .125.....
Seyed Yahya Nikouei (Binghamton University), Yu Chen (Binghamton University), Sejun Song (University of Missouri-Kansas City), Ronghua Xu (Binghamton University), Baek-Young Choi (University of Missouri-Kansas City), and Timothy R. Faughnan (Binghamton University)

Edge Powered Industrial Control: Concept for Combining Cloud and Automation Technologies .130..
Christoph Pallasch (RWTH Aachen University), Stephan Wein (RWTH Aachen University), Nicolai Hoffmann (RWTH Aachen University), Markus Obdenbusch (RWTH Aachen University), Tilman Buchner (BCG Digital Ventures), Josef Walzl (Amazon Web Services), and Christian Brecher (RWTH Aachen University)

Large Scale Stream Analytics Using a Resource-Constrained Edge .135.....
Roshan Bharath Das (Vrije Universiteit Amsterdam), Gabriele Di Bernardo (Vrije Universiteit Amsterdam), and Henri Bal (Vrije Universiteit Amsterdam)

Real-Time Traffic Pattern Collection and Analysis Model for Intelligent Traffic Intersection .140.....
Unnikrishnan Kizhakkemadam Sreekumar (San Jose State University), Revathy Devaraj (San Jose State University), Qi Li (San Jose State University), and Kaikai Liu (San Jose State University)

Author Index	145
---------------------	------------