

2019 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom 2019)

**Sochi, Russia
3 – 6 June 2019**



**IEEE Catalog Number: CFP1905W-POD
ISBN: 978-1-7281-3235-8**

**Copyright © 2019 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:	CFP1905W-POD
ISBN (Print-On-Demand):	978-1-7281-3235-8
ISBN (Online):	978-1-7281-3234-1

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

CURRAN ASSOCIATES INC.
proceedings
.com

Tuesday, June 4 9:00 - 10:40

FP: Resource Allocation

Chair: Luis Suárez (Huawei Moscow Research Center, Russia)

Analysis of YouTube DASH Traffic..... 1

Kamila Ragimova (Moscow Institute of Physics and Technology, Russia); Vyacheslav Loginov and Evgeny Khorov (IITP RAS, Russia)

Resource Allocation for Downlink OFDMA in Underwater Visible Light Communications..... 6

Mohammed Elamassie (Özyeğin Üniversitesi, Turkey); Mehdi Karbalayghareh (Ozyegin University, Turkey); Farshad Miramirkhani (Isik University, Turkey); Murat Uysal (Ozyegin University, Turkey); Mohamed M. Abdallah (Hamad Bin Khalifa University (HBKU), Qatar); Khalid A. Qaraqe (Texas A&M University at Qatar, USA)

Efficient Recurrent Low-Latency Scheduling in IEEE 802.15.4e TSCN Networks..... 12

Glenn Daneels (University of Antwerp & Imec, Belgium); Steven Latré (University of Antwerp - imec, Belgium); Jeroen Famaey (University of Antwerp & Imec, Belgium)

Cloud-based Management of Energy-Efficient Dense IEEE 802.11ax Networks..... 18

Evgeny Khorov and Anton Kiryanov (IITP RAS, Russia); Aleksandr Krotov (The Institute for Information Transmission Problems, Russia)

Energy-Efficient Rotary-Wing UAV Deployment Under Flight Dynamics and QoS Constraints..... 23

Uygar Demir (Hacettepe University, Turkey); Merve Ipek (Aselsan, Turkey); Cenk Toker and Özgür Ekici (Hacettepe University, Turkey)

Tuesday, June 4 16:00 - 16:40

FP: MIMO

Diversity Gain Analysis of Underwater Vertical MIMO VLC Links in the Presence of Turbulence..... 28

Anil Yilmaz and Mohammed Elamassie (Özyeğin Üniversitesi, Turkey); Murat Uysal (Ozyegin University, Turkey)

Reduced Redundancy Indexing for Beam-Time Delay CSI Compression in 5G FDD Massive MIMO Systems..... 34

Luis Suárez, Alexander Sherstobitov and Vladimir Lyashev (Huawei Moscow Research Center, Russia)

Tuesday, June 4 16:40 - 17:40

FP: Security

About the Use of a New Set of Quadrphase Sequences for Increasing Security of PMR over LTE Primary Synchronization..... 39

Claudio Sacchi (University of Trento, Italy)

Prevention of false data injections in smart infrastructures..... 45

Maxim Kalinin and Vasiliy Krundyshev (Peter the Great St. Petersburg Polytechnic University, Russia)

On Lightweight Method for Intrusions Detection in the Internet of Things..... 50

Vladimir V. Shakhov and Insoo Koo (University of Ulsan, Korea)

Wednesday, June 5 9:00 - 9:40

FP: Internet of Things

Chair: Cenk Toker (Hacettepe University, Turkey)

Estimating the sustainability of cyber-physical systems based on spectral graph theory..... 55

Evgeny Pavlenko, Dmitry Zegzhda and Anna Shtyrkina (Peter the Great St. Petersburg Polytechnic University, Russia)

Performance Analysis of MM-SPEED Routing Protocol Implemented in 6LoWPAN Environment..... 60

Georgi Iliev, Kamelia Nikolova and Ravinder Beniwal (Technical University of Sofia, Bulgaria)

Wednesday, June 5 9:40 - 10:40

FP: MAC

Chair: Claudio Sacchi (University of Trento, Italy)

IEEE 802.11ba - Extremely Low Power Wi-Fi for Massive Internet of Things - Challenges, Open Issues, Performance Evaluation..... 65

Dmitry Bankov, Evgeny Khorov, Andrey Lyakhov and Ekaterina Stepanova (IITP RAS, Russia)

Performance Analysis of LBT with Limited Reservation Signal Duration for Fair LTE-LAA/Wi-Fi Coexistence..... 70

Vyacheslav Loginov and Andrey Lyakhov (IITP RAS, Russia); Vyacheslav Zhdanovskiy (IITP RAS, MIPT, Russia)

An Experimental Study of a novel MAC protocol using UHF- RFID Passive Backscatter Modulation for Brain Computer Interface (BCI) Applications... 75

Albena Mihovska (Aarhus University, Denmark); Harshini Hari Krishnan (SDSU, USA); Mahasweta Sarkar and Santosh V Nagaraj (San Diego State University, USA)

Wednesday, June 5 12:00 - 12:30

SP: Coding Theory

Chair: Igor V. Zhilin (Institute for Information Transmission Problems, Russia)

Signal-Code Construction Based on Codes on Gilbert-Varshamov Bound for Multiple Access System over Vector-Disjunctive Channel.....80

Anastasii Smeshko (Institute for Information Transmission Problems & Moscow Institute of Physics and Technology, Russia); Fedor Ivanov (Institute for Information Transmission Problems & National Research University Higher School of Economics, Russia)

Interleaved Cyclic Group Decomposition Length Adaptive MET QC-LDPC Codes.....83

German Svistunov (Huawei Technologies, Russia); Vasilii Usatyuk (Huawei Technologies Co. & South-West University, Russia)

Wednesday, June 5 14:00 - 15:00

SP: BlockChain and Security

Chair: Pierluigi Gallo (University of Palermo, Italy)

Avalanche blockchain protocol for distributed computing security.....86

Dmitry Dmitrievich Tanana (Ural Federal University, Russia)

Building a Private Currency Service Using Exonum.....89

Darya Korepanova (Bitfury, Russia); Maria Nosyk and Alex Ostrovsky (Bitfury, Ukraine); Yury Yanovich (Institute for Information Transmission Problems, Russia)

Using GRU neural network for cyber-attack detection in automated process control systems.....92

Daria Lavrova, Anastasiia Yarmak and Dmitry Zegzhda (Peter the Great St. Petersburg Polytechnic University, Russia)

Benefits of Physical Layer Security to Cryptography: Tradeoff and Applications.....95

Lorenzo Mucchi and Francesca Nizzi (University of Florence, Italy); Tommaso Pecorella (Università degli Studi di Firenze, Italy); Romano Fantacci (University of Florence, Italy); Flavio Esposito (Saint Louis University, USA)

Wednesday, June 5 15:00 - 15:30

SP: Services

Chair: Andrey Lyakhov (IITP RAS, Russia)

Forming of Smart City Resident Digital Identity Based On the City Sources Analysis.....98

Nikolay Teslya, Igor Ryabchikov and Sergey Mikhailov (ITMO University, Russia)

Improving Performance of Web Services in 5G New Radio Systems.....101

Ilya Gerasin (IITP RAS, MIPT, Russia); Artem Krasilov (IITP RAS, NRU HSE, Russia)

Wednesday, June 5 16:00 - 17:45

SP: Internet of Things

Chair: Artem Krasilov (IITP RAS, NRU HSE, Russia)

Digital Signage Personalization for Smart City: Major Requirements and Approach.....104

Nikolay Shilov (SPIIRAS, Russia); Oksana Smirnova (SPIIRAS Hi-Tech Research and Development Office Ltd, Russia); Polina Morozova and Nikolay Turov (ITMO University, Russia); Maksim Shchekotov (SPIIRAS, Russia); Nikolay Teslya (ITMO University, Russia)

A battery lifetime comparison between LoraWAN and Wireless MBus smart meters.....107

Lorenzo Vangelista (University of Padova, Italy); Luca Dell'Anna (Independent Consultant, Italy); Pierpaolo Palazzoli (A2ASmartCity, Italy)

OFDMA Resource Allocation for Real-Time Applications in IEEE 802.11ax Networks.....110

Evgeny Avdotin (IITP RAS & MIPT, Russia); Dmitry Bankov, Evgeny Khorov and Andrey Lyakhov (IITP RAS, Russia)

LTE-Based Network Virtualization Schemes Adaptation for M2M Deployments.....113

Sylvia Gendy and Yasser Gadallah (The American University in Cairo, Egypt)

Distributed Reinforcement Learning Algorithm for Energy Harvesting Sensor Networks.....116

Hanan Al-Tous and Imad Barhumi (United Arab Emirates University, United Arab Emirates)

AOA Measurement Processing for Positioning using Unmanned Aerial Vehicles.....119

Grigoriy Fokin (The Bonch-Bruевич St. Petersburg State University of Telecommunications, Russia)

BioMT: Blockchain for the Internet of Medical Things.....122

Mohamed Selim (University of Louisiana at Lafayette, USA); Khalid Elgazzar (University of Ontario Institute of Technology, Canada)

Thursday, June 6 9:00 - 10:40

FP: Applications

Chair: Nikolay Teslya (ITMO University, Russia)

Challenges and Opportunities using MultiChain for Real Estate..... 126
Mirko Avantaggiato and Pierluigi Gallo (University of Palermo, Italy)

GreenBroker: Optimal Electric Vehicle Park-and-Charge Control via Vehicle-to-Infrastructure Communication..... 131
Qiao Xiang (Yale University, USA); Linghe Kong (Shanghai Jiao Tong University, P.R. China); Xi Chen (Nuance Communications Inc., Canada); Zhe Wang (Shanghai Jiao Tong University, P.R. China); Lei Rao (Huawei Technologies, USA); Xue Liu (McGill University, Canada)

From LTE-A to LTE-M: a Futuristic Convergence between Terrestrial and Martian Mobile Communications..... 136
Claudio Sacchi and Stefano Bonafini (University of Trento, Italy)

Drone Base Station Trajectory Planning for Optimal Resource Scheduling in LTE Sparse M2M Networks..... 141
Zeinab El Sayed and Yasser Gadallah (The American University in Cairo, Egypt)

Conservative Link Adaptation for Ultra Reliable Low Latency Communications..... 147
Andrey Belogaev and Evgeny Khorov (IITP RAS, Russia); Artem Krasilov (IITP RAS, NRU HSE, Russia); Dmitri Shmelkin. (Huawei Technologies, Russia); Suwen Tang (Huawei Shanghai Research Institute, P.R. China)

Thursday, June 6 11:00 - 12:40

FP: PHY

Chair: Claudio Sacchi (University of Trento, Italy)

Power Efficient Beam-Forming Algorithm for Ultra-Reliable Low Latency Millimeter-Wave Communications..... 152
Nilooofar Mehrnia (Koc University Ford Otosan Automotive Technologies Laboratory (KUFOTAL), Turkey); Sinem Coleri Ergen (Koc University, Turkey)

Self-energized Full Duplex UAV-Assisted Cooperative Communication Systems..... 157
Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia); Tharindu Perera (Sri Lanka Institute of Information Technology, Sri Lanka); Muthu Palanivel Chidambara Nathan (National Institute of Technology, India); Mazen Omar Hasna (Qatar University, Qatar)

Joint compensation of power amplifier nonlinear distortions on transmitter and receiver sides..... 163
Pavel Plotnikov and Dmitry Dolgikh (Huawei Technologies Co., Ltd., Russia)

On the Maximum Likelihood Decoding of the coded M-FSK in Rayleigh Channel with Probabilistic Interference..... 168
Igor V. Zhilin (Institute for Information Transmission Problems, Russia)

Vertical Underwater VLC Links over Cascaded Gamma-Gamma Turbulence Channels with Pointing Errors..... 172
Mohammed Elamassie (Özyeğin Üniversitesi, Turkey); Murat Uysal (Ozyegin University, Turkey)

Thursday, June 6 14:00 - 15:00

SP: Selected topics

Chair: Dmitry Bankov (IITP RAS, Russia)

High-performance NIDS Architecture for Enterprise Networking..... 177
Maria Poltavtseva, Dmitry Zegzhda and Evgeny Pavlenko (Peter the Great St. Petersburg Polytechnic University, Russia)

Optimizing Router Bypass Granularity Based on Traffic Behaviour..... 180
Fahad Ghonaim (Taibah University, Saudi Arabia)

Research of characteristics of Visible Light Communications system implemented on Arduino Uno platform..... 183
German Dmitriev, Konstantin Chumak, Andrey Bobrovsky, Roman Andreev and Oleg Vorobyov (Bonch-Bruевич Saint-Petersburg State University of Telecommunications, Russia)

Estimation of Kerr nonlinearity distortion in coherent dense wavelength-division multiplexing fiber-optic communication lines..... 186
Alexey Lotsmanov, Vladislav Neskorniuk, Gleb Sidelnikov and Pavel Plotnikov (Huawei Technologies Co., Ltd., Russia)