

# **2017 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom 2017)**

**Istanbul, Turkey  
5 – 8 June 2017**



**IEEE Catalog Number: CFP1705W-POD  
ISBN: 978-1-5090-5050-5**

**Copyright © 2017 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:	CFP1705W-POD
ISBN (Print-On-Demand):	978-1-5090-5050-5
ISBN (Online):	978-1-5090-5049-9

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

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Program

### 2017 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom)

#### S01: Mobile Communications and Networking - I

<i>An Efficient Transceiver Design for Superimposed Waveforms with Orthogonal Polynomials</i> Evren Catak (Yildiz Technical University, Turkey), Lutfiye Durak-Ata (Istanbul Technical University, Turkey) .....	1
<i>Pilot Contamination Mitigation in TDD Massive MIMO Systems</i> Makram Alkhaled (The University of Manchester, United Kingdom (Great Britain)), Emad Alsusa (Manchester University, United Kingdom (Great Britain)), Ammar Hadi (University of Manchester, United Kingdom (Great Britain)), Abdurrahman Alfitouri (Manchester University, United Kingdom (Great Britain)) .....	6
<i>A Flexible Hybrid Waveform</i> Mahyar Nemati (Istanbul Medipol University, Turkey), Hengameh Takshi (Istanbul Medipol University, Turkey), Huseyin Arslan (University of South Florida, USA) .....	11
<i>Adaptive OFDM-Based Acoustic Underwater Transmission: System Design and Experimental Verification</i> Mohammad Sadeghi (Ozyegin University, Turkey), Mohammed Elamassie (Özyeğin Üniversitesi, Turkey), Murat Uysal (Ozyegin University, Turkey) .....	16
<i>Performance Analysis of Underwater-Wireless Communication with Zero Forcing Precoder</i> Abdurrahman Alfitouri (Manchester University, United Kingdom (Great Britain)), Khairi A. Hamdi (University of Manchester, United Kingdom (Great Britain)), Ammar Hadi (University of Manchester, United Kingdom (Great Britain)), Makram Alkhaled (The University of Manchester, United Kingdom (Great Britain)) .....	21

#### S02: Software Defined Networks

<i>Protecting SDN Controller with Per-Flow Buffering inside OpenFlow Switches</i> Ali Volkan Atli (ARGELA, Turkey), M. Serkant Uluderya (ARGELA, Turkey), Sinan Tatlicioglu (ARGELA, Turkey), Burak Gorkemli (ARGELA, Turkey), Ali Balci (ARGELA, Turkey) .....	26
<i>Joint Server and Route Selection in SDN Networks</i> Hasan Anil Akyıldız (Istanbul Technical University & Ericsson, Turkey), Ibrahim Hokelek (TUBITAK BILGEM, Turkey), Mervan Ileri (Ericsson, United Arab Emirates), Ece Saygun (Ericsson, Turkey), Hakan A. Çirpan (Istanbul Technical University, Turkey) .....	31
<i>Interference Coordination in SDN-Based Heterogeneous Mobile Networks</i> Omer Narmanlioglu (P. I. Works & Ozyegin University, Turkey), Engin Zeydan (Türk Telekom Labs, Turkey) .....	36
<i>Link Utility and Traffic Aware Energy Saving in Software Defined Networks</i> Beakal Gizachew Assefa (Koc University, Turkey), Oznur Ozkasap (Koc University, Turkey) .....	42

#### S03: Molecular Communications

<i>Throughput Optimization for Molecule-as-a-Frame Communications</i> Mustafa Gursoy (Bogazici University, Turkey), Ali E. Pusane (Bogazici University, Turkey), Tuna Tugcu (Bogazici University, Turkey) .....	47
--	----

<i>A Machine Learning Approach to Model the Received Signal in Molecular Communications</i> H. Birkan Yilmaz (Yonsei University, Yonsei Institute of Convergence Technology, Korea), Changmin Lee (Yonsei University, Korea), Yae Jee Cho (School of Integrated Technology, Yonsei Institute of Convergence Technology, Yonsei University, Korea), Chan-Byoung Chae (Yonsei University, Korea) .....	52
<i>Two-way Communication Systems in Molecular Communication</i> Bayram Akdeniz (Bogazici University, Turkey), Ali E. Pusane (Bogazici University, Turkey), Tuna Tugcu (Bogazici University, Turkey) .....	57

## **S04: Cooperative Communications - I**

<i>Wireless-Powered Cooperative Systems With Relay Selection in Spectrum-Sharing Scenario</i> Mohammadali Mohammadi (Shahrekord University, Iran), Zahra Mobini (University of Shahrekord, Iran) .....	62
<i>Outage Performance of a SIMO HP-DF Cooperative Multi-hop Network</i> Mustafa Taştan (Yıldız Technical University, Turkey), Hacı İlhan (Yıldız Technical University, Turkey), Umit Aygölü (Istanbul Technical University, Turkey) .....	67
<i>Implementing Cooperative Communication Protocols: Decode and Forward Case Study</i> Selahattin Gökceli (Istanbul Technical University, Turkey), Semiha Tedik Başaran (Istanbul Technical University, Turkey), Gunes Karabulut Kurt (Istanbul Technical University, Turkey) .....	72
<i>Outage Performance of Dual Hop Full-Duplex Relaying with Alamouti/MRC over Rayleigh Fading Channels</i> Mesut Toka (Gebze Technical University, Turkey), Oğuz Kucur (Gebze Technical University, Turkey) .....	77
<i>Antenna Selection in Cognitive AF systems in the presence of Mutual Primary-Secondary Interference, Limited Feedback and Imperfect Channel Estimations</i> Eylem Erdogan (Istanbul Medeniyet University, Turkey), Asli Birol (Yildiz Technical University, Turkey), Nihat Kabaoglu (Istanbul Medeniyet University, Turkey), Tansal Gucluoglu (Yildiz Technical University, Turkey) .....	82

## **S05: 5G Networks**

<i>An Efficient Downlink Transmission Scheme for 5G Wireless Networks</i> Mohammed Al-Imari (Samsung R&D Institute UK, United Kingdom (Great Britain)), Belkacem Mouhouche (Samsung Electronics Research and Development UK, United Kingdom (Great Britain)) .....	87
<i>Machine Learning Aided Cognitive RAT Selection for 5G Heterogeneous Networks</i> Juan S Perez (University of New Mexico, USA), Sudharman Jayaweera (University of New Mexico, USA), Steven Lane (Air Force Research Laboratory, USA) .....	92
<i>Interference-Aware Distributed Device-to-Device Caching</i> Ahmet Cihat Kazez (TOBB University of Economics and Technology, Turkey), Tolga Girici (TOBB University of Economics and Technology, Turkey) .....	97

## **S06: Modulation**

<i>Space-Time Quadrature Spatial Modulation</i> Zehra Yigit (Istanbul Technical University, Turkey), Ertugrul Basar (Istanbul Technical University, Turkey) .....	102
<i>A Performance of Coded Modulation Based on Optimal Faster-than-Nyquist Signals</i> Aleksandr Gelgor (Peter the Great St. Petersburg Polytechnic University, Russia), Anton Gorlov (Peter the Great St. Petersburg Polytechnic University, Russia) .....	107

<i>Generalized Frequency Division Multiplexing with Space and Frequency Index Modulation</i> Ersin Öztürk (Istanbul Technical University & NETAS Telecommunication A. S., Turkey), Ertugrul Basar (Istanbul Technical University, Turkey), Hakan A. Çirpan (Istanbul Technical University, Turkey) .....	112
<i>Performance Analysis of SEFDM with Optimal Subcarriers Spectrum Shapes</i> Aleksandr Gelgor (Peter the Great St. Petersburg Polytechnic University, Russia), Anton Gorlov (Peter the Great St. Petersburg Polytechnic University, Russia), Van Phe Nguyen (Peter the Great St. Petersburg Polytechnic University, Russia) .....	117

## **S07: Green Communications and Networking - I**

<i>Policy Broker-centric Traffic Classifier Architecture for Deep Packet Inspection Systems with Route Asymmetry</i> Mehmet Akif Yazici (Istanbul Technical University, Turkey), Kasim Oztoprak (Middle East Technical University, Turkey) .....	122
<i>A Dynamic Line Rate Assignment Strategy for MLR WDM Optical Networks</i> Gul Boztok Algin (Ege University, Turkey), Turhan Tunali (Izmir University of Economics, Turkey) .....	127
<i>Modeling of SIP Retransmission Traffic Under Lossy Network Conditions</i> Demir Yavas (Istanbul Technical University & Netas, Turkey), Ibrahim Hokelek (TUBITAK BILGEM, Turkey), Bilge Günsel (Istanbul Technical University, Turkey) .....	132
<i>Improving Video-on-Demand Performance by Multi-channel/ Multicast Approach in Cellular Networks</i> Reza Shokri Kalan (Ege University- Turkey, Turkey) .....	137
<i>ELATS: Energy and Locality Aware Aggregation Tree for Skip Graph</i> Yahya Hassanzadeh-Nazarabadi (Koç University, Turkey), Oznur Ozkasap (Koc University, Turkey) .....	142

## **S08: Mobile Communications and Networking - II**

<i>Discrete Fourier Transform Spread Zero Word OFDM</i> Mahyar Nemati (Istanbul Medipol University, Turkey), Hengameh Takshi (Istanbul Medipol University, Turkey), Huseyin Arslan (University of South Florida, USA) .....	147
<i>A Novel One-Base Station Hybrid Positioning Method</i> Hengameh Takshi (Istanbul Medipol University, Turkey), Mahyar Nemati (Istanbul Medipol University, Turkey), Ercument Arvas (Istanbul Medipol University, Turkey), Tuncer Baykas (Istanbul Medipol University, Turkey) .....	152
<i>In-situ experimental evaluation of LTE downlink signal levels in vicinity of base transceiver stations in urban area</i> Mimoza Ibrani (University of Prishtina & Faculty of Electrical and Computer Engineering, Kosovo), Enver Hamiti (University of Prishtina, Faculty of Electrical and Computer Engineering, Kosovo), Luan Ahma (University of Prishtina, Faculty of Electrical and Computer Engineering, Kosovo), Rreze Halili (University of Prishtina, Faculty of Electrical and Computer Engineering, Kosovo), Jeta Dobruna (Msc., Kosovo) .....	157
<i>Multipath Delay Profile and Doppler Spread of Millimeter Radiowaves over the Sea Channel</i> Niloofer Mehrnia (Istanbul Şehir University, Turkey), Mehmet Kemal Ozdemir (Istanbul Sehir University, Turkey) .....	162
<i>OpenMP and POSIX threads Implementation of Jerasure 2.0</i> Suayb S. Arslan (MEF University, Turkey), Hoa Le (Quantum Corporation, USA), Joseph Landman (Joyent, USA), Turguy Goker (Quantum Corporation, USA) .....	167

## S09: Security, Privacy, Trust

<i>On Computational Approaches to Trust Evaluation in Large-Scale Social Networks</i> Shahriar Etemadi Tajbakhsh (University of Oxford, United Kingdom (Great Britain)), Gaojie Chen (University of Oxford, United Kingdom (Great Britain)), Justin P Coon (University of Oxford, United Kingdom (Great Britain)) .....	172
<i>SU-PhysioDB: A Physiological Signals Database for Body Area Network Security</i> Duygu Karaođlan Altop (Sabancı University, Turkey), Albert Levi (Sabancı University, Turkey), Volkan Tuzcu (İstanbul Medipol University, Turkey) .....	178
<i>Robust Two-factor Smart Card Authentication</i> Omer Mert Candan (Sabancı University, Turkey), Albert Levi (Sabancı University, Turkey) .....	184
<i>Secure Spectrum-Sharing Networks with Full-Duplex Multiple-antenna Wireless-Powered Secondary System</i> Zahra Mobini (University of Shahrekord, Iran), Mohammadali Mohammadi (Shahrekord University, Iran) .....	189

## S10: Cooperative Communications - II

<i>The Effect of Energy Efficiency and Spectrum Efficiency on Bit Error Rate for Unidirectional Relay Networks</i> Muhammad I. Khalil (The University of Auckland, New Zealand) .....	194
<i>On the Performance of Distributed Space-Time Coding with Selection Relaying and Beamforming for Two-Path Successive Relay Network</i> Mahsa Shirzadian gilan (University of Tehran, Iran), Ali Olfat (University of Tehran, Iran) .....	199
<i>An Efficient Method for Channel State Information Feedback in the Relay X-Channel</i> Mohsen Rezaee (University of Tehran, Iran), Behrouz Maham (Nazarbayev University, Kazakhstan) .....	204
<i>Space Shift Keying with Full Duplex Amplify and Forward Relaying</i> Asil Koc (Istanbul Technical University, Turkey), İbrahim Altunbaş (Istanbul Technical University, Turkey), Ertugrul Basar (Istanbul Technical University, Turkey) .....	208
<i>Channel Coded Complex Field Network Coding in Two-Way Relay Networks</i> Rida Khan (Istanbul Technical University & Mehran University of Engineering and Technology, Turkey), İbrahim Altunbaş (Istanbul Technical University, Turkey), Gunes Karabulut Kurt (Istanbul Technical University, Turkey) .....	213

## S11: Internet of Things and Social Networks

<i>A Practical Social Relationship-Based System For Cooperative Internet of Things Operation</i> Yasser Gadallah (The American University in Cairo, Egypt), Mostafa elTager (Zewail City of Science and Technology, Egypt), Yehea Ismail (American University in Cairo, Egypt) .....	218
<i>Extracting User Profiles From Mobile Data</i> Hulya Yalcin (Istanbul Technical University, Turkey) .....	223

## S12: Visible Light Communications

<i>Direct Positioning in Synchronous and Asynchronous Visible Light Systems</i> Furkan Keskin (Bilkent University, Turkey), Sinan Gezici (Bilkent University, Turkey), Orhan Arıkan (Bilkent University, Turkey) .....	228
<i>Effects of Cooperation on Visible Light Positioning</i> Osman Erdem (Bilkent University, Turkey), Furkan Keskin (Bilkent University, Turkey), Sinan Gezici (Bilkent University, Turkey) .....	234

<i>Visible Light Communication Assisted Safety Message Dissemination in Multiplatoon</i> Seyhan Ucar (Koc University, Turkey), Sinem Coleri Ergen (Koc University, Turkey), Oznur Ozkasap (Koc University, Turkey) .....	239
---	-----

### **S13: Green Communications and Networking - II**

<i>Power Control and Resource Allocation in TDD-OFDM Based Femtocell Networks with Interference</i> Mhd Tahssin Altabbaa (Kadir Has University, Turkey), Taner Arsan (Kadir Has University, Turkey), Erdal Panayirci (Kadir Has University, Turkey) .....	244
<i>Reliable Low Latency Communications in LTE Networks</i> Evgeny Khorov (IITP RAS, Russia), Artem Krasilov (IITP RAS, Russia), Aleksei Malyshev (IITP RAS, Russia) .....	249
<i>Downlink Radio Resource Allocation in OFDMA-Based Small Cells Networks</i> Keyvan Aghababaiyan (University of Tehran, Iran), Behrouz Maham (Nazarbayev University, Kazakhstan) .....	254
<i>Cloud-assisted Channel Selection for Wireless Mesh Networks</i> Salim Eryigit (AirTies, Turkey, Turkey), Sarper Gokturk (AirTies Wireless Networks, Turkey) .....	259
<i>Improving Distributed Maximum Weighted Matchings for Communication Networks</i> Can Umut Ileri (Ege University, Turkey), Orhan Dagdeviren (Ege University, Turkey) .....	264

### **S02: Software Defined Networks**

<i>An Application for Detecting Network Related Problems from Call Center Text Data</i> Ibrahim Onuralp Yigit (Turk Telekom Labs, Turkey), Engin Zeydan (Türk Telekom Labs, Turkey), Ahmet F. Ates (Turk Telekom Group & Istanbul Sehir University, Turkey) .....	269
--	-----

### **S09: Security, Privacy, Trust**

<i>Big Data Security: Requirements, Challenges and Preservation of Private Data inside Mobile Operators</i> Cem Dinçer (Türk Telekom, Turkey), Engin Zeydan (Türk Telekom Labs, Turkey) .....	273
--	-----

### **S11: Internet of Things and Social Networks**

<i>Disaster Early Warning using Time-Critical IoT on Elastic Cloud Workbench</i> George Suci (Politehnica University of Bucharest & BEIA Consult International SRL, Romania), Andrei Scheianu (BEIA Consult International SRL, Romania), Marius Constantin Vochin (University Politehnica of Bucharest, Romania) .....	279
<i>Space technologies for disaster early warning and management</i> George Suci (Politehnica University of Bucharest & BEIA Consult International SRL, Romania), Laurentiu Bezdedeau (BEIA Consult International SRL, Romania), Alex Ganaside (BEIA Consult International SRL, Germany), Marius Constantin Vochin (University Politehnica of Bucharest, Romania) .....	284

## S06: Modulation

<i>Space Time Block Coded Spatial Modulation for Free Space Optical Communication</i> Ferhat Fettahoglu (Istanbul University, Turkey), Niyazi Odabasioglu (Currently No Affiliation, Turkey) .....	289
---	-----

## S12: Visible Light Communications

<i>Handover in VLC Networks with Coordinated Multipoint Transmission</i> M. Selim Demir (Özyeğin University & TÜBİTAK BİLGEM, Turkey), Farshad Miramirkhani (Özyeğin University, Turkey), Murat Uysal (Ozyegin University, Turkey) .....	294
<i>Experimental Demonstration of Generalised Space Shift Keying for Visible Light Communication</i> Rui Bian (University of Edinburgh, United Kingdom (Great Britain)), Stefan Videv (University of Edinburgh, United Kingdom (Great Britain)), Alexander D Griffiths (University of Strathclyde, United Kingdom (Great Britain)), Jonathan McKendry (University of Strathclyde, United Kingdom (Great Britain)), Enyuan Xie (University of Strathclyde, United Kingdom (Great Britain)), Erdan Gu (University of Strathclyde, United Kingdom (Great Britain)), Martin Dawson (University of Strathclyde, United Kingdom (Great Britain)), Harald Haas (The University of Edinburgh, United Kingdom (Great Britain)) .....	299

## S05: 5G Networks

<i>A Novel Method for Blind Detection of Users' Activity in Grant-free Access for 5G Networks</i> Mohammed Al-Imari (Samsung R&D Institute UK, United Kingdom (Great Britain)) .....	304
<i>Device-to-Device Caching for Video Content Delivery</i> Koray Necip Aytac (TOBB University, Turkey), Tolga Girici (TOBB University of Economics and Technology, Turkey), Melda Yuksel (TOBB University of Economics and Technology, Turkey), Ali Tellli (HAVELSAN, United Kingdom (Great Britain)), Iltter Koksall (HAVELSAN INC., Turkey) .....	309