

2018 Advances in Wireless and Optical Communications (RTUWO 2018)

**Riga, Latvia
15-16 November 2018**



**IEEE Catalog Number: CFP18AWZ-POD
ISBN: 978-1-5386-5559-7**

**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:	CFP18AWZ-POD
ISBN (Print-On-Demand):	978-1-5386-5559-7
ISBN (Online):	978-1-5386-5558-0

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

Advances in Wireless and Optical Communications

RTUWO'18

Table of contents

Chairs Welcome Message	vi
Steering Committee	vii
Technical Programme Committee (TPC)	viii
Technical Sponsors, Patrons, Promoters and Supporters	xii
Keynote Speakers.....	xix

Abstracts

Reliability and Localization in Sensor Nets and Internet of Things	xxiii
<i>Horst Hellbrück</i>	
Single Lane 200 Gbps Transmitter for IM/DD Links.	xxiv
<i>Oskars Ozolins</i>	
Spectrum Engineering towards 5G: Helping to ensure efficient and interference-free wireless communications	xxv
<i>Rogério Dionísio</i>	
Towards integrated transmitters for short-reach optical links in the C-band	xxvi
<i>Christophe Peucheret</i>	
Digital vs. Analog Radio-over-Fiber Fronthaul: a TCO Comparison	xxvii
<i>Aleksejs Udalcovs</i>	

Session A1 : Wireless communications

Statistical Properties of Wireless Relay System with Correlated Diversity Channels.....	1
<i>M.Delibasic</i>	
An Adaptive Modulation for Relay-Assisted Wireless Optical Network	6
<i>F.Sipahioglu, V.Ozduran, S.Yarman</i>	
Application of the Water Filling Algorithm to the Sum Rate Problem with Minimum Rate and Power Constraint	12
<i>O.Elgarhy, L.Reggiani</i>	
Physical Layer Security of Multi-user Full-Duplex One-Way Wireless Relaying Network	17
<i>V.Ozduran</i>	
Sequence-Based Bit-Cycling in Double Layer Message Security	23
<i>W.Alexan, H.Medhat, A.Hamza, H.Hussein</i>	

Session A2 : 5G Mobile

Dual-Mode Distance-Adaptive Transceiver Architecture for 5G Optical Fiber Fronthaul.....	29
<i>C.Osorio, A.Udalecovs, A.Noll Barreto, P.Monti, O.Ozolins, D.Mello</i>	
A Multirate Loss Model for a 5G Cellular Network with Mobile Users and Quasi-Random Traffic.....	33
<i>P.Efstratiou, I.Moscholios</i>	
Dynamic Handover Control Parameters for LTE-A/5G Mobile Communications.....	39
<i>A.Alhammadi, M.Roslee, M.Alias, S.Alraih</i>	

Bit Error Rate Analysis of Non-Orthogonal Multiple Access (NOMA) Technique in 5G with Different Power and User Scenarios	45
<i>U.Ozmat, O.Ulgen, E.Gunaydin</i>	

Session B2 : Sensor networks in medical diagnosis

Cloud Infrastructure for Skin Cancer Scalable Detection System	N/A
<i>P.Osipov, D.Bliznyk, I.Kuzmina</i>	

A Warning Wearable System Used to Identify Poor Body Postures	55
<i>D.Dobrea, M.Dobrea</i>	

Detection of Negative Emotions and High-Arousal Negative-Valence States on the Move	61
<i>V.Markova, T.Ganchev, K.Kalinkov</i>	

Session A3 : PHY techniques

PSK Modulation/Demodulation and Performance Evaluation in FM Band Using USRP	66
<i>M.Syed</i>	

Rate-adaptation Scheme for Multiband WLAN System	72
<i>M.Yofune, M.Suto, Y.Amezawa</i>	

Channel Length Modeling for a Multiple-Input-Multiple-Output CamCom Link	78
<i>M.Attia, A.Bermak</i>	

Experimental Verification of Wireless Power Transfer Ability to Sustain the Operation of LoRaWAN Based Wireless Sensor Node	83
<i>S.Tjukovs, J.Eidaks, D.Pikulins</i>	

BER-Based Estimation of OFDM CFO-Caused Symbol Phase Deviation	89
<i>A.Lipovac, E.Skaljo, V.Lipovac, P.Njemčević</i>	

Session B3 : Control systems

Weather Prediction Algorithm Based on Historical Data Using Kalman Filter	94
<i>N.Bogdanovs, A.Ipatovs, V.Bistrovs, R.Belinskis, E.Petersons</i>	

Intelligence System of Building Management System for Energy Efficiency in the Test Facility	100
<i>N.Bogdanovs, A.Krūmiņš, R.Belinskis, V.Aforņičevs, V.Jeralovičs, A.Ipatovs</i>	

Indoor Navigation of Quadrotors via Ultra-Wideband Wireless Technology	106
<i>I.Papastratis, T.Charalambous, N.Pappas</i>	

Dual Channel Sliding Mode Control for Chua's Circuit	N/A
<i>R.Volianskyi, O.Sadovoi, O.Sinkevych, N.Volianska</i>	

Session A4 : Antennas and electromagnetics

A Log-Periodic Antenna for Long Range Communication Within a Wireless Sensor Network System for Sea Water Quality Monitoring	161
<i>G.Gragnani, D.Caviglia, C.Montecucco</i>	

Quadrifilar Helical Antennas with Different Types of Supply Lines	167
<i>O.Shcherbyna, O.Tomai, O.Kozhokhina</i>	

Increasing of Low-Profile Connected Arrays Bandwidth	N/A
<i>L.Liubina, M.Sugak</i>	

Design and Analysis of Dual-Band Circular Polarization 3D Printed Reflectarray	175
<i>S.Ballandovich, L.Liubina, M.Sugak</i>	

Split-step Padé Approximations of the Helmholtz Equation for Radio Coverage Prediction over Irregular Terrain	179
<i>M.Lytaev, A.Vladyko</i>	

A New Aluminum Alloy Cable Cleat Design and Development a Smart Cable Protection System	185
<i>N.Çetinkaya</i>	

Measurement of Sheet Dielectric Materials at UHF Band	189
<i>P.Terenteva, A.Golovkov, V.Malyshev</i>	

Session B4 : Optical communications

Re-designing Dedicated Protection in Transparent WDM Optical Networks with XOR Network Coding	118
<i>D.Hai</i>	

Performance Evaluation of WSW2 Switching Fabric Architecture with Limited Number of Spectrum Converters	124
<i>W.Kabacinski, M.Abdulsahib, M.Michalski</i>	
Spectral Characterization of an Erbium-Doped Fiber Ring Laser for Wideband Operation	130
<i>S.Sadik, F.Durak, A.Altuncu</i>	
Evaluation of 4-PAM, NRZ and Duobinary Modulation Formats Performance for Use in 20 Gbit/s DWDM-PON Optical Access Systems	134
<i>T.Salgals, L.Skladova, K.Vilcane, J.Braunfelds, S.Spolitis</i>	
Research of FBG Optical Sensors Network and Precise Peak Detection	139
<i>U.Senkans, J.Braunfelds, S.Spolitis, V.Bobrovs</i>	
Research on NRZ-OOK and Duobinary Modulation Formats for C and L Band 25 Gbit/s WDM-PON Transmission Systems	144
<i>M.Aleksejeva, S.Spolitis</i>	
Evaluation of the Channel Spacing and Transceiver Bandwidth for PAM-4 Modulated WDM-PON	148
<i>S.Spolitis, I.Kurbatska, V.Bobrovs</i>	
Analysis of Non-Ideal Optical Correlation for Interrogating Overlapping FBG Spectra	154
<i>A.Ahrens, S.Lochmann, M.Götten</i>	
Session A5 : Sensor networks	
Data Processing in Case of Radio Equipment Reliability Parameters Monitoring	219
<i>O.Solomentsev, M.Zaliskyi, T.Herasymenko, O.Kozhokhina, Y.Petrova</i>	
Deployment Algorithms to Simulate Large-scale Node Failures in Wireless Sensor Networks	223
<i>I.Senturk</i>	
Listen and Talk in IEEE 802.15.4 with Dual Radio	229
<i>S.Leugner, H.Hellbrück</i>	
AODV-CBR: Capacity-based Path Discovery Algorithm for MANETs with High Utilization	234
<i>K.Streit, N.Rodday, G.Dreo Rodosek</i>	
An Integrated Decision Support System Based on Wireless Sensor Networks Applied in Precision Agriculture	240
<i>N.Samaras</i>	
Microwave Sensor Network for Quantitative Characterization of Targets: A Proof-of-Concept	246
<i>A.Fedeli, G.Gragnani, M.Pastorino, A.Randazzo</i>	
Interference Management in LoRaWANs - Overview and Simulation Study	251
<i>V.Stoynov, Z.Valkova-Jarvis, V.Poulikov</i>	
Experimental Study of the Impact of Waveforms on the Efficiency of RF-to-DC Conversion Using a Classical Voltage Doubler Circuit	257
<i>A.Litynenko, J.Eidaks, S.Tjukovs, D.Pikulins, A.Aboltins</i>	
Session B5 : Networking techniques	
Impact of Self-Configuration on Handover Performance in Green Cellular Networks	194
<i>A.Ozyurt, M.Basaran, L.Durak-Ata</i>	
Degree Contact DC-Epidemic Routing Protocol for Opportunistic Networks	N/A
<i>S.Sati, A.Sohoub, A.Eltahar, K.Bin Ahmad, K.Ahmad, A.Bakeer</i>	
Cityroam, Providing Secure Public Wireless LAN Services with International Roaming	N/A
<i>H.Goto</i>	
Mobile LTE Network Signal and Quality of Service Parameter Evaluation from End-User Premises	209
<i>A.Stafecka, A.Lizunovs, V.Bobrovs</i>	
Hybrid Vehicular IEEE 802.11N and LTE Wireless Network Performance Evaluation in Non-Stationary Mode of Motion	213
<i>A.Ancans, E.Petersons, A.Umanskis</i>	
<hr/>	
Author index	263