

2021 IEEE Microwave Theory and Techniques in Wireless Communications (MTTW 2021)

**Riga, Latvia
7 – 8 October 2021**



**IEEE Catalog Number: CFP21V25-POD
ISBN: 978-1-6654-2470-7**

**Copyright © 2021 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:	CFP21V25-POD
ISBN (Print-On-Demand):	978-1-6654-2470-7
ISBN (Online):	978-1-6654-2469-1

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

2021 IEEE Workshop on Microwave Theory and Techniques in Wireless Communications

MTTW

Table of contents

Table of contents	III
Chairs' Welcome Message	VI
Steering Committee	VII
List of Reviewers	VIII
Technical Sponsors, Patrons, Promoters and Supporters	XI
Keynote speakers	XIV

Session P1 : In-person presentations

Signal Waveform Impact on RF-DC Conversion Efficiency for Different Energy Harvesting Circuits	1
<i>J.Eidaks, R.Kusnins, D.Laksis, R.Babajans, A.Litvinenko</i>	
Multi-Static UWB Radar for Classification of Objects from Different Materials	7
<i>K.Greitans, M.Greitans</i>	
Simplified Implementation of Compressed Sensing Reconstruction Algorithm in FPGA	12
<i>S.Mijla, A.Aboltins, M.Pudzis, D.Pikulins, J.Grizans</i>	
Analysis of the Possibility of Using Cellular Networks in Vehicular Networks and Remote-Control Channels of Drones in Terms of Delays	18
<i>A.Kutins, D.Brodnevs</i>	
FPGA Implementation and Study of Antipodal Chaos Shift Keying Secure Communication System	24
<i>F.Capligins, A.Litvinenko, D.Kolosovs</i>	
Byzantine Failures and Vehicular Networks	30
<i>D.Rjazanovs, E.Petersons, A.Ipatovs, L.Juškaite, R.Yeryomin</i>	
Conformance Analysis of Model for Material Properties Determination Using Simulation of Ultra-Wideband Pulse Radar	35
<i>G.Gaigals, V.Aristovs, M.Greitans</i>	
A Multi-Mode Approach for the Enhanced Decision Adjusted Modulus Algorithm Usage in Blind Equalization of QAM Signals	40
<i>D.Kolosovs</i>	
Integrated Circuit of Clocked Comparator for Ultra-Wideband Radar	46
<i>R.Maliks, G.Supols, M.Greitans, E.Lobanovs</i>	
Chaotic Non-Coherent Pulse Position Modulation Based Ultra-Wideband Communication System	52
<i>R.Munirathinam, A.Aboltins, D.Pikulins, J.Grizans</i>	
Research on Features Extraction for Live Streaming Video Classification with Deep and Convolutional Neural Networks	58
<i>E.Grabs, T.Chen, E.Petersons, D.Efrosinin, A.Ipatovs, J.Kluga, D.Culkovs</i>	

Session C1 : Optical communication and Photonics

Geometric Constellation Shaping with Pulse Amplitude Modulation in Short Reach Optical Links	143
<i>J.Singh, A.Sandmann, A.Ahrens, S.Lochmann, C.Benavente Peces</i>	
OTDR Based Prediction of Residual BER	149
<i>A.Lipovac, V.Lipovac, M.Hamza, E.Skaljo</i>	

Airplane Type Identification Based on Mask RCNN; An Approach to Reduce Airport Traffic Congestion	154
<i>W.Alshaibani, M.Helvaci, I.Shayea, A.Azizan</i>	
Modelling and Simulation of Quantum Key Distribution Using OptSim	160
<i>O.Grote, A.Ahrens, C.Benavente Peces</i>	
Network Coding in Photonicland: Three Commandments for Future-Proof Optical Core Networks	165
<i>D.Hai</i>	
Joint Pre- and Post-Equalization in Optical MIMO with Multimode Fiber Link	171
<i>J.Singh, A.Ahrens, S.Lochmann, C.Benavente Peces</i>	
Session A1 : Beyond 5G technologies	
Bearing Measurement with Beam Sweeping for Positioning in 5G Networks	64
<i>G.Fokin</i>	
Investigating 5G V2X QoS Using Turbo Codes	68
<i>D.Kosmanos, C.Chaikalis, I.Savvas, K.Anagnostou, D.Bargiotas</i>	
Optimized Performance Evaluation of a Q-Learning Hard Handover Algorithm for Load Balancing.	74
<i>C.Parreño Muirragui, P.Lupera, R.Llugsi, V.Párraga</i>	
A 5.8GHz Slot Antenna with Parallel Slit Loading for 5G Conformal and Wearable Applications	80
<i>E.Li, X.Li, B.Seet</i>	
Sub-Optimum Radio Resource Allocation in Vehicle-To-Vehicle Communications Based on A Multi-Step Hungarian Algorithm.	86
<i>M.Hosseini, S.Shirvani Moghaddam</i>	
Design of a Compact Vivaldi Antenna for Millimeter-Wave 5G Communication System.	92
<i>F.Mahub, R.Islam, S.Al-Nahyun, M.Ali</i>	
Ping-Pong Handover Effect Reduction in 5G and Beyond Networks	97
<i>S.Alraih, R.Nordin, I.Shayea, N.Abdullah, A.Alhammadi</i>	
Two Element Multiband MIMO Antenna for WiFi/5G/WLAN Band Applications.	102
<i>S.B, N.Kumar, V.M, P.Hunagund</i>	
Session B1 : Microwave Electronics	
Investigation of the Multilayer Semiconductor Waveguides in Sub-THz Range	107
<i>V.Rusen, A.Katkevičius, D.Plonis</i>	
Advanced Gunn Diode on Based Graded GaPAs - GaInAs as High Power Source of Millimeter Wave	111
<i>I.Storozhenko</i>	
Electromagnetic Modeling of a Slotted Waveguide Feed Technique Device Based on a Comparative Study of WCIP and MOM-GEC Methods	117
<i>M.Abd, T.Aguili</i>	
Miniaturized Substrate Integrated Waveguide Compact Bandpass Filters with CMRC Technique	123
<i>R.Rebbah, I.Messaoudene, M.Khelifi, B.Hammache, T.Denidni</i>	
The Averaging Effect on Resonant Frequency Calculations of a Partially Filled Microwave Cavity Using FDTD Method	129
<i>O.Bişkin, T.Saydam, S.Aksoy</i>	
Optimization of the WCIP Method for Multilayer Circuits	134
<i>F.Medeiros, C.Benigno de Abrantes, R.Maniçoba, G.Karla de Freitas Serres, A.Serres</i>	
Design of a Frequency Selective Surface Based on a Notched Semi-Overlapped Square Patches	139
<i>M.Karahan, E.Aksoy</i>	
Session C2 : Signal processing for communications	
An Investigation for Imperfect CSI Effects on Half-Duplex/Full-Duplex Relaying Network	269
<i>V.Ozduran</i>	
Data Processing for Analysis of Deteriorating Radio System with Redundancy.	275
<i>M.Zaliskyi, O.Solomentssev, O.Zuiev, M.Pavlenko, I.Zakharchenko, Y.Petrova</i>	
Fast Algorithms for Generating Real-Valued Spreading Sequences for High-Speed Wireless Communication Systems Based on PSSS	280
<i>L.Lopacinski, N.Maletic, A.Hasani, J.Gutiérrez, E.Grass</i>	

Empirical Bayesian Method in the Problem of a Harmonic Signal Detecting in the Gaussian Noise	285
<i>I.Prokopenko, I.Omelchuk, Y.Petrova, O.Omelchuk</i>	
Multi-Target Vital Signs Remote Monitoring Using mmWave FMCW Radar	290
<i>Y.Zhao, V.Sark, M.Krstic, E.Grass</i>	
Performance Comparison of cGAN Models for Channel Estimation in One-Bit Massive MIMO System	296
<i>J.Yadav, V.Dwivedi, S.Chaturvedi</i>	
Human Activity Classification via Millimeter-Wave Channel Level Crossing Estimation	301
<i>R.Marsalek, R.Zavorka, M.Pospisil, J.Vychodil, J.Gothans, J.Blumenstein</i>	
Minimizing Collision of Fading Channel Using Machine Learning	306
<i>M.ALhaddad, S.Sati, M.Elmusrati</i>	
Session A2 : IoT, Sensor and other Networks	
Blocking Probabilities in a Mobility-Aware CAC Algorithm of a Vehicular WiFi Network	177
<i>I.Keramidi, I.Moscholios, P.Sarigiannidis, M.Logothesis</i>	
Adaptive Technique for LoRa Communication with LEO Nanosatellite	182
<i>J.Vandavasi Karunamurthy, S.Bendoukha, I.Nikolakakos, T.Ghaoud, F.Ebisi, M.Alkharat</i>	
Multi-Purpose Medical Drone for the Use in Pandemic Situation	188
<i>G.Ganesan, M.Mokayef</i>	
Deep Neural Network-Based Method for Detection and Classification of the Malicious Network Traffic	193
<i>M.Usman, S.Ahmad, M.Saeed</i>	
A Deep Reinforcement Learning Approach for LoRaWAN Energy Optimization	199
<i>Y.Yazid, I.Ez-zazi, M.Arioua, A.El Oualkadi</i>	
Performance of Energy Harvesting Full-Duplex Amplify-And-Forward Relay Network with TAS/MRC	205
<i>H.Balaban, O.Kucur</i>	
Investigating Efficient Municipal Solid Waste Collection Through Technology	211
<i>S.Squire, S.Rehman, M.Khan</i>	
Verification of Consistency Between Ethernet Based QoS with Performance Prediction of Heterogeneous Microwave Radio-Relay Backhaul Network	217
<i>S.Zlatar, A.Lipovac, V.Lipovac</i>	
Session B2 : Antennas	
Range-Angle Dependent Radiation by Using Non-Uniform Period Time Modulated Arrays	223
<i>I.Kanbaz, U.Yesilyurt, E.Aksoy</i>	
Triangular Aperture UWB Antenna with Dual Band-Notched Characteristic for WLAN Bands	228
<i>A.Toktas</i>	
GPR Application with Different Antennas for Road Pavement Condition Assessment	233
<i>D.Batrkov, M.Antyufeyeva, A.Batrkova</i>	
A Reconfigurable Antenna in Frequency Band and Radiation Using Active Frequency Selective Surfaces on the Basis of PIN Diodes	238
<i>B.Mekimah, T.Djerafi, A.Messai, A.Belhedri</i>	
Geometry Aided Deterministic Synthesis Approach for Concentric Ring Sparse Array Antennas	243
<i>A.Kedar</i>	
New Design Rules to Improve Helical Antenna Performance	248
<i>O.Abu Ella</i>	
Design of a Compact SWB High Gain Antenna Using a Fully PEC Reflector	253
<i>M.Belazzoug, K.Khodja, E.Ksouri, R.Rebbah, I.Messaoudene, Y.Braham Chaouche, B.Hammache, T.Denidni</i>	
Study of 140 GHz Waveguide Fed Lenses with Different Dielectric Constant	258
<i>C.Gu, L.Bai</i>	
Design and Performance Analysis of a Dual Stub MIMO Antenna for On-Body Applications	263
<i>F.Mahbub, R.Islam, M.Ali, M.Rahman</i>	
<hr/>	
Author index	312