

2023 16th International Conference on Signal Processing and Communication System (ICSPCS 2023)

**Bydgoszcz, Poland
6-8 September 2023**



**IEEE Catalog Number: CFP2390G-POD
ISBN: 979-8-3503-3352-7**

**Copyright © 2023 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:	CFP2390G-POD
ISBN (Print-On-Demand):	979-8-3503-3352-7
ISBN (Online):	979-8-3503-3351-0

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

Table of Contents

Welcome Message from the General Chairman

Organizing Committee

Technical Program Committee

Advisory Committee

List of Reviewers

Keynote Address:

Reconfigurable intelligent surfaces for 6G wireless communications: principles, selected use cases, and challenges.....1

Paweł Sroka (Poznań University of Technology, Poland)

Joint Communications and Sensing in Fiber-Optic Access Networks - State of the Art.....3

Patryk. J. Urban (West Pomeranian University of Technology in Szczecin, Poland)

Session 1: Modulation and Coding

OTFS Modulation for Non-Terrestrial Networks: Concepts, Applications, Benefits, and Challenges.....4

Thi My Chinh Chu and Hans-Juergen Zepernick (Blekinge Institute of Technology, Sweden); Anders Höök (SAAB AB, Sweden); Alexander Westerhagen (Saabgroup, Sweden); Bo Granbom (Saab AB, Sweden)

Binary error probability of a very high data rate, amplitude modulated, communication system affected by timing jitter.....14

Paul Miqueu (CNRS & Gipsa-Lab, France); Laurent Ros (GIPSA-lab & INPG & CNRS organisation, France); Jean-Marc Brossier (GIPSA-lab/DIS - BP 46 Saint-Martin-d'Hères, France); Fabrice Belvèze (ST-Microelectronics, France)

Turbo-DC-FPSK: a joint turbo coding and FPSK based modulation scheme adapted to optical wireless communications.....20

Paul Miqueu (CNRS & Gipsa-Lab, France); Yannis Le Guennec (Gipsa-Lab, France); Laurent Ros (GIPSA-lab & INPG & CNRS organisation, France); Muhammad Jehangir Khan (Université Grenoble Alpes, CNRS, Grenoble INP, GIPSA-Lab, France)

Precoding to Reduce Complexity of Factor Graph for MIMO-SCMA.....27

Kazushi Takada and Takahiko Saba (Chiba Institute of Technology, Japan)

Session 2: Communication Networks

Improvements to data reconstruction in IoT sensor networks under realistic conditions.....32

Piotr Cofta and Romana Antczak-Jarząbska (WSB Merito University in Gdańsk, Poland)

The infeasibility of using reference nodes in reputation-based IoT sensor networks.....38

Piotr Cofta (WSB Merito University in Gdańsk, Poland); Beata Marciniak (Bydgoszcz University of Science and Technology, Poland)

Throughput Slopes Prediction in 5G Networks with Gaussian Regression Process.....44

Marcello G. Costa (Instituto Tecnológico de Aeronáutica, Brazil); Dauda Olayinka Ayanda (Sidia Institute of Science and Technology, Brazil); Bruno Sátiro Silva and Dércio M. Mate (SIDIA Institute of Science and Technology, Brazil); Alvaro Ortega (Sidia Institute of Science and Technology, Brazil)

Explainable Fault Analysis in Mobile Networks: A SHAP-based Supervised Clustering Approach.....49

Madalena Cilínio (CELFINET, Portugal); Márcio Pereira (Celfinet, Portugal); David Duarte (Instituto de Telecomunicações and CELFINET, Consultoria em Telecomunicações, Lda., Portugal); Luís Miguel Mata (Instituto Superior Técnico & Instituto Superior de Engenharia de Lisboa, Portugal); Pedro Vieira (Instituto de Telecomunicações / ISEL, Portugal)

Session 3: Network Security

ESPuF - Enabling SRAM PUFs on Commodity Hardware.....58

Julian Dreyer (University of Applied Sciences Osnabrueck, Germany); Ralf Tönjes (University of Applied Sciences Osnabrück, Germany); Nils Aschenbruck (Osnabrück University, Germany)

Distributed Neural Network-Based DDoS Detection in Vehicular Communication Systems.....68

Nicholas Jatón (University of Nebraska-Lincoln, USA); Sohan Gyawali (East Carolina University, USA); Yi Qian (University of Nebraska - Lincoln, USA)

Vulnerability Identification of Operational Technology Protocol Specifications Through Formal Modeling.....77

Matthew Boeding and Michael Hempel (University of Nebraska-Lincoln, USA); Hamid Sharif (University of Nebraska-Lincoln, USA)

A Markovian Model of Dynamic Cyber Risk Assessment Based on Questionnaires.....83

Andrzej Karbowski (Research and Academic Computer Network NASK & Warsaw University of Technology, Poland); Przemysław Jaskóła (Research and Academic Computer Network NASK, Poland)

Session 4: Novel Applications of Signal Processing and AI

EUR/USD Forex Market Prices Prediction Using MLP.....89

Roger Achkar, Gaby H Abou Haidar and Raed Diab (American University of Science and Technology, Lebanon); Alain Nohra (Aust, Lebanon); Ahmad Atwi (American University of Science and Technology, Lebanon)

Evaluation of ChatGPT Applicability to Learning Quantum Physics.....97

Agata Stefańska (Gdańsk University of Technology, Poland); Tomasz P Stefanski (Gdansk University of Technology, Poland); Michał Czubenko (Gdańsk University of Technology, Poland)

An end-to-end Approach to a Reinforcement Learning in Transport Logistics.....107

Mohammed Ibrahim El-hajj (Twente University, The Netherlands); Nerea Ramon Gomez (Van Lanschot Kempen, The Netherlands)

Detecting Buying and Selling Territories in the Foreign Currency Exchange Market.....117

Tuba Islam and Konstantin Kapinchev (University of Greenwich, United Kingdom (Great Britain))

Session 5: Localization and UAVs

The Trimmed LASSO for Direction of Arrival Estimation by the Generalized Soft-Min Penalty.....123

Longxin Bai, Jingchao Zhang, Meiyu Fan and Liyan Qiao (Harbin Institute of Technology, China)

Impact of carrier frequency offset and phase noise on the steering vector for 3D drone localization based on angle of arrival (AOA).....129

Mehari Meles, Akash Rajasekaran, Lauri Mela, Kalle Ruttik and Riku Jäntti (Aalto University, Finland)

On Target Detection in the Presence of Clutter in Joint Communication and Sensing Cellular Networks.....135

Julia Vinogradova (Ericsson Research, Finland); Gabor Fodor (Ericsson Research & Royal Institute of Technology (KTH), Sweden)

Joint Optimization of User Scheduling, Flight Path and Power Allocation in A UAV-Enabled Communication System.....145

Lipei Liu, Rugui Yao, Ye Fan and Xiaoya Zuo (Northwestern Polytechnical University, China); Juan Xu (Chang'an University, China); Lin Yu and Peng Wang (Northwestern Polytechnical University, China); Xudong Li (School of Electronics and Information, Northwestern Polytechnical University, China)

Session 6: Implementation

Towards Low-Complexity, Fully Parallel and Flexible Hardware Realization of DCT/IDCT.....151

Mojtaba Mahdavi (Ericsson, Sweden)

VDSL Single Ended Line Test baselining with Uncalibrated Echo Response data.....158

Feiyu Fang and Lykourgos Kekempanos (BT Group, United Kingdom (Great Britain))

VDSL fault detection using Single Ended Line Test Uncalibrated Echo Response data.....164

Feiyu Fang and Lykourgos Kekempanos (BT Group, United Kingdom (Great Britain))

Radio Environment Model for High-Fidelity Simulator of Mobile Ad Hoc Networks with Dynamic Spectrum Management.....171

Jerzy Łopatka, Anna Kaszuba-Checinska and Radoslaw Checinski (Military University of Technology, Poland)

Session 7: Signal Processing for Multimedia and Communication

ACR360: A Dataset on Subjective 360 Video Quality Assessment for ACR Methods.....178

Majed Elwardy, Hans-Juergen Zepernick, Yan Hu and Thi My Chinh Chu (Blekinge Institute of Technology, Sweden)

Balancing transmission properties in regular and irregular graph-based networks by controlling transmission resources.....186

Slawomir Bujnowski (UTP University of Science and Technology, Poland); Zbigniew Lutowski (Bydgoszcz University of Science and Technology, Poland); Adam Flizikowski (University of Science and Technology, Poland)

Session 8: Detection and Estimation

Remodelled and Reduced complexity-OMP-based Channel Estimation Schemes for Intelligent Reflecting Surface-Aided Millimeter Wave Systems.....193

Olutayo O. Oyerinde (University of the Witwatersrand, South Africa); Adam Flizikowski (University of Science and Technology, Poland); Tomasz Marciniak (Bydgoszcz University of Science and Technology & U1111, Poland)

Packet Too Big Detection and its Integration into QUIC.....198

Timo Völker (FH Mnster University of Applied Sciences, Germany); Michael Txen (Mnster University of Applied Sciences, Germany)

List of authors