



# MAREW 2023 Microwave and Radio Electronics Week 2023

APRIL 19-20, 2023

Pardubice | Czech Republic

33rd International Conference Radioelektronika 2023

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**MAREW 2023 - Conference program**  
**33rd International Conference Radioelektronika 2023**

<b>Wednesday - April, 19</b>	<b>Thursday - April, 20</b>	
9:00	9:00	
Opening Session: RADIO 2023 (Invited speaker)	IT - Room A	MT - Room B
10:00	10:00	10:00
Special Section Wireless technologies in defence and security applications	Coffee break	
11:00	11:15	11:15
Coffee break		
11:15	Closing Session Room A	
SPaA - Room A	11:45	
13:15	13:15	
Lunch		
14:00	12:30	
SPaA - Room A	CaS - Room B	
16:00	16:00	
Coffee break	Poster Session	
16:30	16:30	
IT - Room A	MT - Room B	
17:30	17:30	
Wednesday 19:00 - 23:00 Evening party		
Registration Wednesday 19 April 2023 8:30 - 15:00 Thursday 20 April 2023 8:30 - 10:00  CaS - Electronic Circuits and Systems SPaA - Signal Processing and Applications IT - Information Technologies MT - Microwave Technologies		

**Venue of the conference**

Faculty of Electrical Engineering and Informatics  
 náměstí Čs. legií 565  
 530 02 Pardubice  
 Czech Republic

<b>RADIO 2023</b>			<b>Wednesday, April 19, 9:00 - 10:00</b>
<b>H1 - Opening Session (Room H)</b> <i>Session Chair: Zdenek Nemeč, Jan Pidanič, University of Pardubice, Czech Republic</i>			
		Welcome speech	Zdenek Nemeč, Paul Charles Hooper University of Pardubice
	H1/1	3D radar design, a story of science & engineering challenges	Pavel Sedivý System Engineer, RETIA, a.s.
		Using SDR for Active and Passive Radar Prototyping	Yotta Volt s.r.o. Lukas Vosmek
<b>RADIO 2023</b>			<b>Wednesday, April 19, 10:00 - 11:00</b>
<b>H2 - Special Section: Wireless Technologies in Defence and Security Applications (Room H)</b> <i>Session Chair: Zdenek Nemeč, Jan Pidanič, University of Pardubice, Czech Republic</i>			
10:00 - 10:15	H2/1	PNT resilience in a world of emerging cyber threat	Peter Wollmann, Jiri Kalvoda
10:15 - 10:30	H2/2	Frequency-spectrum based anti-drone protection of strategic objects	Milan Tenusak
10:30 - 10:45	H2/3	Security and Reliability of Room Occupancy Detection Using Probe Requests in Smart Buildings	Tomas Fryza, Tomas Bravenec, Zdenek Kohl
10:45 - 11:00	H2/4	Digital urban platform as an impulse for a modern, environmentally-safe and secure city	Peter Barcik, Aneta Coufalikova, Petr Frantis, Jiri Vavra
<b>RADIO 2023</b>			<b>Wednesday, April 19, 11:15 - 13:15</b>
<b>A1 - Signal Processing and Applications (Room A)</b> <i>Session Chair: Pavel Sedivý, RETIA, a.s., Czech Republic</i>			
11:15 - 11:30	A1/1	Application of Compressed Sensing to Radar Signals	Jozef Perdoch, Zdenek Matousek, Miroslav Pavec, Stanislava Gazovova
11:30 - 11:45	A1/2	Omnidirectional Image Quality Assessment Database (OMNIQAD): Description and Examples	Marek Simka, Ladislav Polak, Jan Kufa, Martin Novotny, Adam Zizien, Karel Fliegel

11:45 - 12:00	A1/3	Identification of trolling in memes using convolutional neural networks	Manohar Gowdru Shridara, Daniel Hládek, Matúš Pleva, Renat Haluska
12:00 - 12:15	A1/4	Performance Analysis of Cooperative NOMA Power Line Communication Networks with Imperfect SIC	Ehab Moustafa Fareed Mohammed Shaheen, Mohammad Reza Soleymani
12:15 - 12:30	A1/5	Software and Hardware Encoding of Omnidirectional 8K Video: A Performance Study	Jan Kufa, Ladislav Polak, Marek Simka, Adam Stech
12:30 - 12:45	A1/6	Optimization of signals and compression filters for MIMO radars with asymmetric output signal waveforms	Pavel Bezousek, Simeon Karamazov, Tomas Marik
12:45 - 13:00	A1/7	Modeling and Measurement of Reflected Signals with u-Doppler Effect from Various Targets using a Pulse Radar	Josef Jordan
13:00 - 13:15	A1/8	Investigation Of EDF/ROA Hybrid Optical Amplifier In WDM Optical System	Norbert Zdravecky, Lubos Ovsenek, Jakub Oravec, Maros Lapcak, Samuel Andrejcik

### **B1 - Electronics Circuits and Systems (Room B)**

*Session Chair: Ankita Tiwari, Indian Institute of Technology, India*

11:15 - 11:30	B1/1	FPGA Implementation of a IEEE 1451 Compliant Transducer Interface Module	Cristina Laura Sirbu, Petru Papazian, Mircea Babaița
11:30 - 11:45	B1/2	Embedded Encryption and Compression Solution for Resource-Constrained ARM Microcontrollers	Shameera Cassim, Tristyn Ferreira, Amit Kumar Mishra
11:45 - 12:00	B1/3	VLF system for SID monitoring	Ivaylo Nachev, Peter Petkov
12:00 - 12:15	B1/4	DVCC+ Based Grounded Inductor Simulator Suitable for Capacitance Multiplier and Frequency Dependent Negative Resistor	Tayfun Unuk
12:15 - 12:30	B1/5	Frequency Quadrupler for Ultra-Wideband mm-Wave M-Sequence Transceiver	Miroslav Sokol, Pavol Galajda, Patrik Jurik, Martin Pospisil
12:30 - 12:45	B1/6	Ti:LiNbO <sub>3</sub> Based EO-MZI Count Optimized Design of Reversible Peres Gate	Barnali Chowdhury, Shashank Awasthi, Mohammad Arif Jalil, Alak Majumder, Sanjeev Kumar Metya
12:45 - 13:00	B1/7	Dual-Mode Oscillator with SC Quartz Resonator Operating at Elevated Temperatures	Vladimír Stofanik, Peter Kubinec, Elena Cocherova
13:00 - 13:15	B1/8	The Creation Method of a Solar Tracker Using the Zybo SoC	Roland Szabo, Radu-Stefan Ricman

<b>RADIO 2023</b>	<b>Wednesday, April 19, 14:00 - 16:00</b>
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**A2 - Signal Processing and Applications (Room A)**  
*Session Chair: Petr Dolezel, University of Pardubice, Czech Republic*

14:00 - 14:15	A2/1	Quality comparison of 360° 8K images compressed by conventional and deep learning algorithms	Jan Kufa, Adam Budac
14:15 - 14:30	A2/2	Hybrid binaural singing voice separation	Peter Kasak, Roman Jarina, Maros Jakubec, Dasa Ticha
14:30 - 14:45	A2/3	Detection of Fractures in Dogs' Long Bones	Buşra Açış, Mustafa Sert, Selda Guney, Gulnur Begum Canguz
14:45 - 15:00	A2/4	A Novel Method for 3D Photogrammetry Modeling using Different Wavelengths	Adam Stech, Robert Hudec, Patrik Kamencay, Ladislav Polak, Jan Kufa
15:00 - 15:15	A2/5	Transfer learning from English to Slovak in speech recognition applications	Anton Buday, Jozef Juhar, Anton Cizmar
15:15 - 15:30	A2/6	3D reconstruction of a group of plants by the ground multi-image photogrammetry method	Irena Drofova, Haozhou Wang, Wei Guo, Martin Pospisilik, Milan Adamek, Jan Valouch
15:30 - 15:45	A2/7	Speech therapy applications based on speech technologies	Stanislav Ondas, Anton Cizmar, Lea Simcikova, Juraj Kovac
15:45 - 16:00	A2/8	Employing Quantile and Probability Plots for Comparing and Assessing Goodness of Fit for Stochastic Models of the DCT Coefficients of Lossy Compressed Images	Dmytro Kotov, Oleksii Fedorov, Anatolii Omelchenko, Jan Pidanic, Petr Dolezel

**B2 - Electronics Circuits and Systems (Room B)**  
*Session Chair: Saras Mani Mishra, Indian Institue of Technology, India*

14:00 - 14:15	B2/1	IndiRVCore: Design and Implementation of a pipelined RISC-V processor	Ankita Tiwari, Prithwijit Guha, Gaurav Trivedi, Jan Pidanic, Navneeth Jayaraj, Nitesh Gupta
14:15 - 14:30	B2/2	An Adaptive Window Function based Memristor Model	Ananda Y R, Arkadeep Hajra, Gaurav Trivedi
14:30 - 14:45	B2/3	Development of an Intelligent Racking System for early Detection of Abnormal Conditions	Martin Dobrovolny, Jan Fikejz, Jiri Rolecek
14:45 - 15:00	B2/4	Comparative Exploration of Gate Count and Leakage Optimized D-Latch in Nanometer CMOS	Pritam Bhattacharjee, G. Naveen Goud, Vipin K. Singh, Vijay P. Yadav, Abir J. Mondal, Alak Majumder
15:00 - 15:15	B2/5	Design of Differential Oscillator with Dielectric Resonator in a 130nm SiGe BiCMOS technology	Patrik Jurik, Pavol Galajda, Miroslav Sokol, Tomas Urbanec

15:15 - 15:30	B2/6	Low Voltage FinFET Based OTA	Elif Demirci, Sinem Keles
15:30 - 15:45	B2/7	Construction of a Generator for Power Frequency Magnetic Field Immunity Test	Martin Pospisilik, Irena Drofova, Stanislav Kovar, Tomas Dulik, Ales Tesacek
15:45 - 16:00	B2/8	Comparison of Hardware Implementations of Cryptographic Algorithms for IoT Applications	Sushree Sila P. Goswami, Gaurav Trivedi
<b>RADIO 2023</b>			<b>Wednesday, April 19, 16:30 - 17:30</b>
<b>A3 - Information Technologies (Room A)</b>			
<i>Session Chair: Tomas Fryza, Brno University of Technology, Czech Republic</i>			
16:30 - 16:45	A3/1	Clustering using Conditional generative adversarial networks (cGANs)	Marek Ruzicka, Matus Dopiriak
16:45 - 17:00	A3/2	Single Frequency Networks for DVB-T2: Analysis of Real Case Scenarios in Czech Republic	Ladislav Polak, Vojtech Barta, Arvind Dhaka, Jan Kufa, Marek Simka, Radim Zedka, Roman Sotner
17:00 - 17:15	A3/3	Text Data Pre-Processing for Time-series Modelling	Jitka Pomenkova, Petr Korab, David Strba
17:15 - 17:30	A3/4	Effects of the Multi-Beam Optical FBMC Technology with Applied Data Separations in Optical Wireless Communications	Rastislav Roka, Lucie Hudcova, Alzbeta Kovalova, Ana Garcia Armada
<b>B3 - Microwave Technologies (Room B)</b>			
<i>Session Chair: Lubos Rejfek, University of Pardubice, Czech Republic</i>			
16:30 - 16:45	B3/1	A Reconfigurable Leaky Wave Antenna	Jan Machac, Milan Svanda, Vaclav Kabourek
16:45 - 17:00	B3/2	Highly Independent Dual-Band Permittivity Sensors for Simultaneous Measurement of Solid Materials	Syah Alam, Zahriladha Zakaria, Indra Surjati, Noor Azwan Shairi, Mudrik Alaydrus, Teguh Firmansyah
17:00 - 17:15	B3/3	Threshold Degradation of Digital Receivers due to Interference in Fixed Wireless Access Networks	Attila Hilt
17:15 - 17:30	B3/4	Interaction of selected parts of the human body with radio frequency fields	Bystrik Dolnik, Ervin Lumnitzer, Pavol Liptai, Erika Dolnikova, Elena Jurgovska, Lubos Sarpataky

<b>RADIO 2023</b>			<b>Thursday, April 20, 9:00 - 10:00</b>
<b>A4 - Information Technologies (Room A)</b> <i>Session Chair: Matus Pleva, Technical University of Košice, Slovak Republic</i>			
9:00 - 9:15	A4/1	Comparison of Feed-Forward and RNN models for Intrusion Detection in Data Network Security using UNSW-NB15 Dataset	Matus Cavojsky, Gabriel Bugar, Dusan Levicky
9:15 - 9:30	A4/2	Performance analysis of Non-Standalone 5G network under different traffic models	Olimpjon Shurdi, Alban Rakipi, Aleksander Biberaj
9:30 - 9:45	A4/3	Deep data analysis methods applied to hard switching in hybrid FSO/RF systems	Maros Lapcak, Lubos Ovsenik, Norbert Zdravecky, Jakub Oravec, Samuel Andrejcik
9:45 - 10:00	A4/4	Game Theory and Decentralized Blockchain Technology Enabled for Secure and Reliable Routing in MANETs in 6G Environments	Maros Baumgartner, Jan Papaj, Natalia Kurkina, Lubomir Dobos
<b>B4 - Microwave Technologies (Room B)</b> <i>Session Chair: Tomas Zalabsky, University of Pardubice, Czech Republic</i>			
9:00 - 9:15	B4/1	Improved RCS Chipless RFID Tag Array for Long Reading Range	Mohamed El-Hadidy, Likitha Lasantha, Shahed I. Khan, Yasmine El Sayed, Nemaï C. Karmakar
9:15 - 9:30	B4/2	Electronically Controlled Waveguide Phase Shifter for High Power Applications	Miroslav Popela, Ondrej Simon, Jaroslav Lacik
9:30 - 9:45	B4/3	Comparison of Size Reduction Techniques in Spiral Antenna Design	Rabia Nur Sağ, Tolgahan Tuylu, Nurhan Turker Tokan
9:45 - 10:00	B4/4	Metamaterial Based Sensor Using Fractal Hilbert Structure for Liquid Characterization	Russul Khalid AbdulSattar, Mohammad Alibakhshikenari, Taha A. Elwi, Zaid A. Abdul Hassain, Mohammad Soruri, Nurhan Türker Tokan, Chan Hwang See, and Patrizia Livreri
<b>RADIO 2023</b>			<b>Thursday, April 20, 10:15 - 11:15</b>
<b>A5 - Information Technologies (Room A)</b> <i>Session Chair: Dominik Stursa, University of Pardubice, Czech Republic</i>			
10:15 - 10:30	A5/1	A new approach for routing in Cloud MANET	Natalia Kurkina, Jan Papaj, Maros Baumgartner, Anton Cizmar

10:30 - 10:45	A5/2	Experimental Comparison of 4G and 5G Technologies for Connected and Automated Vehicles	Boris Cucor, Patrik Kamencay, Milan Dado, Tibor Petrov
10:45 - 11:00	A5/3	Dataset Conversion for Spiking Neural Networks	Erik Sadovsky, Maros Jakubec, Darina Jarinova, Roman Jarina
11:00 - 11:15	A5/4	Speech Command Recognition Based on Convolutional Spiking Neural Networks	Erik Sadovsky, Maros Jakubec, Roman Jarina
<b>B5 - Microwave Technologies (Room B)</b> <i>Session Chair: Tomas Zalabsky, University of Pardubice, Czech Republic</i>			
10:15 - 10:30	B5/1	Passive Retranslation with Space Wave Coupled Antennas	Peter Petkov, Evelin Lyubenov
10:30 - 10:45	B5/2	Low-Cost Open-Hardware System for Measurements of Antenna Far-Field Characteristics in Non-Anechoic Environments	Jan Olencki, Vorya Waladi, Adrian Bekasiewicz
10:45 - 11:00	B5/3	Atmospheric turbulence models for vertical optical communication	Lucie Hudcova, Rastislav Roka, Martin Kyselak
11:00 - 11:15	B5/4	A Wideband High-efficiency Doherty Power Amplifier for LTE	Kaan Koca, Huseyin Şerif Savci, Sedef Kent Pinar
<b>RADIO 2023</b>			<b>Thursday, April 20, 11:15 - 11:45</b>
<b>Closing Session and Student Award Ceremony</b> <i>Session Chair: Zdenek Nemec, University of Pardubice, Czech Republic</i>			



<b>RADIO 2023</b>		<b>Wednesday, April 19, 16:00 - 16:30</b>
<b>Poster Session (Room P)</b> <i>Session Chairs: Pidanic Jan, University of Pardubice, Czech Republic</i>		
P/1	Some Variants Current Mode Filter via Commercial Integrated Circuits and its Proprieties	Bohumil Brtnik
P/2	The human activity recognition using radio frequency signals	Malek Ali, Roman Marsalek
P/3	Sallen-Key Filter using TCOA Via Commercial Integrated Circuits	Bohumil Brtnik, David Matousek
P/4	Multi-Branch Multi Layer Perceptron: A Solution for Precise Regression using Machine Learning	Ondrej Zeleny, Tomas Fryza
P/5	Resistance of the radio modems against the narrow band interference	Lubos Rejtek, Pavel Rozsival, Tan N. Nguyen, Phuong T. Tran