

# **2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON 2017)**

**Kyiv, Ukraine  
29 May – 2 June 2017**

**Pages 1-604**



**IEEE Catalog Number: CFP17K03-POD  
ISBN: 978-1-5090-3007-1**

**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:	CFP17K03-POD
ISBN (Print-On-Demand):	978-1-5090-3007-1
ISBN (Online):	978-1-5090-3006-4

**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

# CONTENTS

## Track 1: Microwave Techniques, Antennas & Radar Systems

<b>Radiation Field of a Dipole Placed at Impedance Sphere</b>	29
Yu. M. Penkin, V. A. Katrich, M. V. Nesterenko, S. L. Berdnik, N. K. Blinova	
<b>Principal Modes on an Acupuncture-Like Needle with Low Loss</b>	33
Gerard A. Rankin, Andrew Z. Tirkel	
<b>Radar Retina or a Millimeter Wave Eye?</b>	39
Andrew Tirkel, Imants Svalbe	
<b>Thin Dielectric Resonators in Microwaves</b>	45
D.D. Tatachuk, Y.V. Didenko, V.I. Molchanov, A.S. Franchuk, and Y.M. Poplavko	
<b>EM Exposure Study on an Inhomogeneous Child Model Considering Hand Effect</b>	51
T. Nozadze, V. Jeladze, M. Tsverava, V. Tabatadze, M. Prishvin, R. Zaridze	
<b>An Exploratory Model of the Hardware-Software Unit for Adaptive Digital Time Signal Processing Against the Background of Masking Clutters</b>	55
V. P. Riabukha, D. I. Likhovitskiy, A. V. Semenyaka, E. A. Katyushin	
<b>Tunable Disk Patch Antenna</b>	59
L. N. Lytvynenko, S. A. Pogarsky and D. V. Mayboroda	
<b>Study of the ATI SAR Target Signature for Non-Linear Airborne Tracks</b>	63
M. Balaban, A. Kovorotniy, V. Gorobets, F. Kivva, Yu. Goncharenko, G. Farquharson, A. Jessup	
<b>Influence of Parallelepiped Surface Defects on Terahertz and Optical Ellipsometry Measurements</b>	67
A.I. Belyaeva, A.A. Galuza, I.V. Kolenov	
<b>Permanent Magnet Focusing System Optimization for SubMM-Waveband Clinotrons</b>	71
Kostyantyn Ilyenko, Yurii Novosel, Tetyana Yatsenko	
<b>Nonuniform Absorbing Coating as an Effective Way to Reduce Radar Visibility of an Object with the Surface Formed by Flat Conductive Plates</b>	75
Vitalii Atamanyuk, Andrii Zvonko, Yuriy Kosovtsov, Yuriy Shabatura	
<b>Passive Ferrite Resonator-Based Millimeter Wave Band Components</b>	80
I. V. Zavislyak, M. A. Popov, G. Srinivasan	
<b>Diffraction by Two Semi-Infinite Gratings Placed in the Same Plane</b>	84
Mstislav E. Kaliberda, Sergey A. Pogarsky	
<b>Scalar Potential Calculations for Relativistic Charged-Particle Beam in Unbounded Coaxial Drift Tube</b>	89
Tetyana Yatsenko, Kostyantyn Ilyenko	
<b>Plasma Density Evaluation in the Sharply-bounded Ionosphere Model by Tweaks</b>	94
Yu. V. Gorishnya	
<b>Synthesis of Circularly Polarized Radiation by Inphase Crossed Impedance Wire Dipoles with Screen</b>	98
N. P. Yeliseyeva, V. A. Katrich, M. V. Nesterenko, A. N. Gorobets	
<b>Excitation of Whispering Gallery Modes in a High Double-Layer Disc Shielded Dielectric Resonator</b>	102
A. Kogut, I. Kuz'michev, R. Dolia, S. Nosatiuk, Ye. Shulha	
<b>The Radiation Characteristics of Antenna Systems with a Cone-Sphere Radome</b>	106
Oleg I. Sukharevsky, Vitaly A. Vasilets, Sergey V. Nechitaylo, Ivan E. Ryapolov	
<b>Effect of Modes Frequencies Splitting in Ferrite Resonators</b>	110
Igor Zavislyak, Hryhorii Chumak	

<b>Space-Charge Limited Current of Relativistic Charged-Particle Beam in Coaxial Drift Tube of Finite</b> Kostyantyn Ilyenko, Tetyana Yatsenko, Gennadiy V. Sotnikov	114
<b>Spectral Quasi-Optical Terahertz Ellipsometer</b> A.I. Belyaeva, A.A. Galuza, I.V. Kolenov, S.V. Mizrakhy	118
<b>Pattern Detection and Recognition in SAR Images</b> Ievgen M. Gorovyi, Dmytro S. Sharapov	123
<b>RLC-Circuit Effective Medium Approach for Two-Component Non-Magnetic Metamaterials</b> Oleg Rybin, Sergey Shulga	127
<b>Performance Prediction in Radar Image Filtering and Lossy Compression. Part I: Filtering</b> V. Lukin, O. Rubel, S. Abramov, A. Zemliachenko	131
<b>Performance Prediction in Radar Image Filtering and Lossy Compression. Part II: Compression</b> V. Lukin, O. Rubel, S. Abramov, A. Zemliachenko	137
<b>Quad-Band Matching Network Design with Real Frequency Technique Employing Frequency</b> Serkan Yildiz, Ahmet Aksen, Siddik B. Yarman	143
<b>Radio Waves Interference above a Spherical Sea Surface</b> Nadiia Babanska, Yurii Efremov, Vitalii Vovk	148
<b>Diffraction of H-polarized Electromagnetic Wave by Pre-Fractal System of Slots in PEC Screen</b> George I. Koshovy	152
<b>Decomposition Method for Complex Target RCS Measuring</b> Alexander Maslovskiy, Nikolay Kolchigin, Maxim Legenkiy, Mariya Antyufeyeva	156
<b>Adaptive Filtration of Parameters of the UAV Movement on Data from its Location Calculated on The Basis The Time Difference of Arrival Method</b> Igor O. Tovakch, Serhii Ya. Zhuk	160
<b>Usage of Radar Signal Phase Structure Entropy for Detection of Weakly Moving Ground Objects behind Foliage of Shrubs and Trees</b> Sugak V.G., Lohvinov M.Yu., Hlasunov A.S.	166
<b>Complex Reflection Coefficient Determination via Digital Spectral Analysis of Multiprobe Reflectometer Output Signals</b> M.V. Andreev, O.O. Drobakhin, D. Yu. Saltykov	170
<b>Parameters of the Patch Antenna Outside Operating Frequency Range</b> S.V. Siden	176
<b>Multiple Reflections from Non-periodic Bragg Layered Structures</b> M.V. Andreev, V.F. Borulko, O.O. Drobakhin, D.V. Sidorov	180
<b>Wideband Polarizing Quasioptical Terahertz Phase Shifter</b> Oleg Kosiak, Volodymyr Bezborodov, Pavlo Nesterov	184
<b>Optimal Radar Cross Section Estimation in Synthetic Aperture Radar</b> V. K. Volosyuk, S. S. Zhyla	189
<b>Experimental Detection of Wave Chaos in Quasioptical Cavity Resonator with Random Bulk</b> Z.E. Eremenko, E.M. Ganapolskii	194
<b>History and Perspectives of THz Components and Circuits Using Oversize Dielectric-Lined Waveguides</b> Sergey Mizrakhy	198
<b>Modeling the Non-homogeneous Media with Specific Refraction Coefficient</b> Mykhaylo Andriychuk	202
<b>Mathematical Model of Contact Excitation of Ultrasonic Waves by a Disk Piezoelectric Transducer</b> Margarita Romanyuk, Oleg Petrishev, Ganna Vlasyuk	206

<b>Variations of the Effective Height of the Lower Ionosphere by Results of Analysis of Tweek-Atmospherics. Preliminary Results</b>	211
A. P. Krivonos, A. V. Shvets, S. M. Khmara	
<b>Complementary coded waveforms sets in Marine Radar Application</b>	215
V. Koshevyy, V. Popova	
<b>Generation Properties of Nonlinear Layered Objects and Eigen-Modes of the Linearized Problems</b>	221
Lutz Angermann, Vasyl V. Yatsyk, Mykola V. Yatsyk	
<b>Transient Radiation of System of Four Noncollinear Dipoles</b>	225
V.A. Plakhtii, O.M. Dumin, O.A. Prishchenko	
<b>X-Band Resonator for Studying the Various Axially Symmetric Inhomogeneities in the Frequency Band</b>	229
I. Ivanchenko, M. Khruslov, N. Popenko, V. Plakhtii, S. Mykhaliuk	
<b>Non-Invasive Measurement of Blood Lactate in Humans using Microwave Sensors</b>	233
A. Mason, J. Louis, J. Greene, O. Korostynska, L. E. Cordova-Lopez, B. Abdullah, R. Connell, J. Hopkins	
<b>Simulation of Liquid Hydrometeors' Scattering Power Distribution in Multi-Polarization Radar</b>	239
Yuliya Averyanova, Anna Rudiakova, Felix Yanovsky	
<b>Range Profiling of Vessels with Pseudo-Random Radar Waveforms</b>	243
Davide Massaroy, Riccardo Ardoino	
<b>Feasibility of In-Situ Quality Assessment of Zinc Contamination in Water</b>	249
Ilaria Frau, Olga Korostynska, Patrick Byrne, Alex Mason	
<b>Detection of Glyphosate in Deionised Water Using Machine Learning Techniques with Microwave</b>	253
Sean Cashman, Olga Korostynska, Andy Shaw, Paulo Lisboa	
<b>Dielectrometry of Pharmaceutical Ingredient Solutions at Microwaves</b>	257
K.S. Kuznetsova, Z.E. Eremenko, A.I. Shubnyi, V.V. Glamazdin, M.P. Natarov	
<b>Transient Radiation of Circle with Uniform Current Distribution</b>	261
Oleksandr Dumin, Rolan Akhmedov, Viktor Katrich, Olga Dumina	

## Track 2: Bioengineering & Robotics

<b>Adaptive Backstepping Control Design for Electromechanical Systems</b>	267
Ramazan Coban	
<b>Determination of Low Hemoglobin Level in Human Using the Analysis of Symbolic Dynamics of the Heart Rate Variability</b>	271
Sergey S. Krivenko, Anatolii A. Pulavskiy, Stanislaw A. Krivenko	
<b>Picking a Human Fall Detection Algorithm for Wrist-Worn Electronic Device</b>	275
Illia Kukharenko, Volodymyr Romanenko	
<b>Neuro-musculoskeletal Simulator of Human Rhythmic Movements</b>	278
Andrii Shachykov, Patrick Henaff, Andrii Shachykov, Anton Popov, Alexander Shulyak	
<b>The Ratio of Standard Ear Tympanogram and the Area of the Eardrum</b>	284
Sergey Naida, Olha Pavlenko	

<b>Method of Identifying and Eliminating Magnetic Compass Deviation</b> V.V. Meleshko, S.L. Lakoza, S.A. Sharov	288
<b>The Microwave Imaging Method for Express Diagnostic of Cancer</b> Shtoda D. A., Arkusha Y.V., Mustetsov M. P.	292
<b>Determining Optimal Dilation Factor of Non-Dyadic Wavelet Transform</b> Oleg Chertov, Volodymyr Malchykov	297
<b>The Technical Inspection of Device for Integrated Evaluation of the Antioxidant Activity of Foods</b> Serhiy Batachenko, Roman Tomashevskyi	301
<b>Conditional Linear Random Process and Random Coefficient Autoregressive Model for EEG Analysis</b> Mykhailo Fryz	305
<b>Efficiency Evaluation of Electroacoustic Sensors for Auscultation Devices of Human Body Life-Activity Sounds</b> Anastasiia Makarenkova, Anna Poreva, Mykola Slozko	310
<b>Development of a Simulation Tool for Optimal Design of a Mobile Photoplethysmography Sensor</b> Illia V. Fedorin, Vladimir R. Tuz, Sergii V. Gryshchenko, Jong Min Choi, So Hyun Chung	314
<b>NMR Properties of Fenna-Matthews-Olson Light Harvesting Complex: Photosynthesis and its Biomedical Applications</b> Shyam Badu, Roderick Melnik	318
<b>Scalp EEG Activity During Simple and Combined Motor Imageries to Control a Robotic ARM</b> Cecilia Lindig-Leon, S'ebastien Rimbart, Oleksii Avilov, Laurent Bougrain	322

### Track 3: Energy Systems, Industry Application & Industry 4.0

<b>Fuzzy Model of Transfer Criteria for Network Distribution to 20 kV voltage</b> B. Tsyganenko, V. Kyryk	329
<b>Synthesis of Mathematical Models for One Class of Electromechanical Systems With Variable Parameters</b> Oleksandr Mokin, Borys Mokin, Oleksandr Kryvonis	334
<b>Variable-Frequency Electric Drive with a Function of Compensation for Induction Motor Asymmetry</b> Mykhaylo Zagirnyak, Andrii Kalinov, Viacheslav Melnykov	338
<b>Parametric Synthesis of Reservoir Capacitor Circuits in the Thyristor Generator of Discharge Pulses with the Controllable Voltage Feedback</b> N.I. Suprunovska, A.A. Shcherba	345
<b>Wound Rotor Induction Machine with an Excitation from Capacitor Energy Caused by Slip Power</b> Omelyan Plakhtyna, Oleksiy Kuznyetsov	349
<b>Properties of CdTe Films Prepared By DC Magnetron Sputtering</b> Kirichenko M.V., Zaitsev R.V., Dobrozhan A.I., Khrypunov G.S., Kharchenko M.M.	355
<b>Development Of Hybrid Solar Generating Module For High-Efficiency Solar Energy Station</b> Zaitsev R.V., Kirichenko M.V., Khrypunov G.S., Prokopenko D.S., Zaitseva L.V.	360
<b>Mathematical Model of the Semiconductor Converter with Twelve-zone Regulation of Output Voltage</b> Mykhailenko V.V., Buryan S.O., Maslova T.B., Naumchuk L.M., Chuniyak J.M., Charnjak O.S.	365

<b>Effective Inductor Systems for Pulsed Accelerators and Actuators</b> V. T. Chemerys, I. O. Borodiy	369
<b>Comparison of Different Types of Electromechanical Systems for Creating the Counter-Rotating</b> Ihor Shchur, Volodymyr Klymko	373
<b>Providing Fixed Level of Electric Energy Supply Quality In Conditions of Renovation of Power Distribution Electrical Networks with Renewable Energy Sources</b> P. Lezhnyuk, V. Komar, S. Kravchuk, O. Nanaka	379
<b>A Software Phase-Locked Loop of Control System of a Series-Resonant Voltage-Source Inverter for Induction Heating Equipment</b> P. Herasymenko, V. Hutsaliuk, V. Pavlovskiy, O. Yurchenko	384
<b>Characteristic Of Capacitive Sensor For The Air Gap Control System In The Hydrogenerator</b> Ievgen O. Zaitsev, Anatolii S. Levytskyi, Bogdan A. Kromplyas	390
<b>Method of Approximation the Magnetizing Inductance Curves of Self-Excited Induction Generators</b> Mykola Pushkar, Nataliya Krasnoshapka, Mykola Pechenik, Vitalii Bovkunovych	395
<b>Conception of Efficiency of Heat Electromechanical Complex as Hybrid System</b> Zablodskiy Mykola, Zhiltsov Andriy, Kondratenko Igor, Gritsyuk Volodymyr	399
<b>Economic and Mathematical Modeling to Optimize Competitive Renewable Technologies Expansion</b> Vasyl O. Kostiuk	405
<b>Impact of Linear Regulator, Installed in the Electric Grid of Energy Supply Company, on Power Losses</b> A. Kylymchuk, P. Lezhnyuk, O. Rubanenko	411
<b>Modeling of Water Tree Growth Between Micro-Inclusions in XLPE Cable Isolation and its Effect on Electric Field Distribution</b> M.A. Shcherba	417
<b>Design and Analysis of a Linear Actuator for Contactless Positioning Systems</b> Mousa Lahdo, Sergej Kovalev, Tom Ströhla	421
<b>Three-Dimensional Modeling of Electromagnetic and Temperature Fields in the Inductor of Channel-Type Furnace for Copper Heating</b> M.A. Shcherba	427
<b>The Specificity of Electrical Energy Storage Unit Application</b> Evgen Sokol, Volodymyr Zamaruev, Serhiy Kryvosheev, Bohdan Styslo, Vadym Makarov	432
<b>The Prevention Measure of Resonance Overvoltages In Extra High Voltage Transmission Lines</b> Vladislav Kuchanskyy	436
<b>Heat Loss Minimization Field Control of Motionless Induction Motors in Pause of Intermittent Duty</b> Olga Tolochko, Mykola Sopiha	442
<b>The Investigation of Wave Process During Propagation of Plate Voltage Pulse on Three-Phase Performance Cable Line</b> Vadim Lobodzinskiy, Yurii Tsyban	448
<b>Electric Power System Simulation for Risk Assessment of Power Transformer Failure under External Short-Circuit Conditions</b> E.I. Bardyk, N.P. Bolotnyi	452
<b>Smart Road as a Complex System of Electric Power Generation</b> Andrey Gnatov, Shchasyana Argun, Natalia Rudenko	457
<b>Two Nonlinear Controllers for Voltage Source AC-DC Converter</b> S. Peresada, S. Kovbasa, D. Pushnitsyn, Y. Zaichenko	462

<b>Determine The Boundary Value of the Concentration of Gases Dissolved in Oil of Method Minimum Risk</b>	468
Shutenko Oleg	
<b>Assessment of Pipeline Network Leakage Influence on Dynamic Characteristics of the Pump Complex</b>	473
Mykhaylo Zagirnyak, Roman Manko, Viktoriya Kovalchuk, Tetyana Korenkova	
<b>Development of The Method for Determining the Number of Direct Lightning Strikes in Overhead Lines with Protected Wires</b>	479
Sergey Shevchenko, Dmytro Danylchenko	
<b>Energy Efficient and Simple Control of Stand-Alone Combine Heat-Power Generation Small Wind Turbine</b>	483
Ihor Shchur, Yurii Biletskyi, Vsevolod Shchur	
<b>vThe Application of Power-Law Distribution for Capacitor Banks Selection in the Electrical Supply Systems And Networks</b>	489
Iurii Zubiuk	
<b>Apparent Power Decompositions of Three-Phase Power Supply System to Develop Control Algorithms of Shunt Active Filter</b>	495
M.Yu. Artemenko, S.Y. Polishchuk, V.M. Mykhalskyi, I.A. Shapoval	
<b>Simulation and Analysis of Power Frequency Electromagnetic Field in Buildings Closed to Overhead Lines</b>	500
Volodymyr Rozov, Volodymyr Grinchenko	
<b>Improving of IDA-PBC Systems by Forming Additional Regulatory Actions on Directly Uncontrollable System Loops</b>	504
Ihor Shchur, Yurii Biletskyi, Ihor Golovach	
<b>VCharacteristics of Induction Motor Drives with Torque Maximization in Field Weakening Region</b>	508
Bogdan Pryymak, Manuel Moreno-Eguilaz	
<b>Vibration Transmission in Electronic Packages Having Structurally Complex Design</b>	514
J. Boiko, I. Kovtun, S. Petrashchuk	
<b>A Double Fourier Series Implementation for Modulated Signal with the Arbitrary Modulation</b>	518
Ievgen Verbytskyi	
<b>The Use of Kotelnikov-Nyquist-Shannon Sampling Theorem for Designing of Digital Control System for a Power Converter</b>	522
V.V. Zamaruiev	
<b>Analysis of the Impact of Nonlinear Distortion in Voltage and Current Curves on the Errors of Electric Energy Metering Devices</b>	528
György Morva, Vitalii Volokhin, Illia Diahovchenko, Zsolt Čonka	
<b>Automation of Intelligent Sensor Injection Inlet In Polymer Moldings By Using Vector Controlled Electric Drive</b>	534
V.I. Sivetsky, O.M. Khalimovskyy, O.L. Sokolskyy, I.I. Ivitsky	
<b>Novel Single-Stage Buck-Boost Inverter with Unfolding Circuit</b>	538
Oleksandr Matiushkin, Oleksandr Husev, Ryszard Strzelecki, Sergey Ivanets, Artem Fesenko	
<b>Evaluation of Low- and High-Voltage GaN Transistors in Soft-Switching DC-DC Converter</b>	544
Andrei Blinov, Roman Kosenko, Andrii Chub	
<b>Speed Sensorless Direct Field Oriented Control of Induction Generator</b>	548
S. Peresada, S. Kovbasa, M. Zhelinskyi, A. Duchenko	



<b>Research of the Interrelationship Between the Frequency Converter on the Basis of the Resonant Inverter with Nonlinear Control Power Unit Parameters and its Load</b>	554
Gennadiy Pavlov, Irina Vinnichenko, Mikhail Pokrovskiy	
<b>Investigation the Maximal Values of Flux and Stator Current of Autonomous Induction Generator</b>	560
Sergey Korol, Sergey Buryan, Mykola Pushkar, Mykhola Ostroverkhov	
<b>Operation Possibility of Grid Connected Quasi-Z-Source Inverter with Energy Storage and Renewable Energy Generation in Wide Power Range</b>	564
Kaspars Kroics, Janis Zakis, Aleksander Suzdalenko, Oleksandr Husev, Kostiantyn Tytelmaier, Kamal Khandakji	
<b>Controller Design for Interleaved Bidirectional DC-DC Converter with Coupled Inductors</b>	570
Kostiantyn Tytelmaier, Oleksandr Husev, Oleksandr Veligorskyi, Maksym Khomenko, Oleh Khomenko	
<b>Electrotechnical Control and Current Protection System of the High-Voltage Pulse-Current Generator</b>	574
Natalia Nazarova, Dmitriy Vinnichenko	
<b>Model Predictive Control of Photovoltaic Bidirectional DC-DC Converter with Coupled Inductors</b>	578
Maksym Khomenko, Oleksandr Veligorskyi, Oleksandr Husev, Kostiantyn Tytelmaier, Roman Yershov	
<b>Discrete Models of the Electric Grid Elements, Obtained with Using the Second-Order Formula of Implicit Gear Method</b>	584
S.M. Lebedka, M.V. Petrovskiy, Yu.N. Vepryk	
<b>Bidirectional Isolated ZVS DC-DC Converter with Auxiliary Active Switch for High-Power Energy Storage Applications</b>	589
Volodymyr Ivakhno, Volodymyr Zamaruev, Bohdan Styslo, Roman Kosenko, Andrei Blinov	
<b>Interleaved Single-Phase Quasi-Z-Source Inverter with Special Modulation Technique</b>	593
Carlos Roncero-Clemente, Oleksandr Husev, Serhii Stepenko, Enrique Romero-Cadaval, Dmitri Vinnikov	
<b>Power Grid Converter Control Improvement Based On Contextual Data</b>	599
Ievgen Verbytskyi, Anna Kyselova, Gennadiy Kyselov	
<b>Efficient Simulation of Wind Generation Systems Using Voltage-Behind-Reactance Model of Doubly-Fed Induction Generators and Average-Value Model of Switching Converters</b>	605
Navid Amiri, Seyyedmilad Ebrahimi, and Juri Jatskevich	
<b>On-board diagnostics of Li-Ion battery packs for electric vehicles using a combination of spectroscopy and identification methods</b>	611
Alexander Kuznietsov, Tilman Happek	

#### Track 4: Nanoelectronics and Photonics, Electron Devices & Embedded Systems

<b>Impact of Magnetic and Electrical Ordering on Resistivity: New Insights</b>	617
Y.M. Poplavko, A.V. Borisov	
<b>Relationship Between Electron Work Function And Crystal Lattice Constant</b>	623
L. Korolevych, A. Borisov, H. Shevliakova	
<b>Microwave Signal Frequency Determination Using Multiple Spin-Torque Microwave Detectors</b>	628
P.Yu. Artemchuk, O.V. Prokopenko	
<b>Late Reverberation Reduction and Blind Reverberation Time Measurement for Automatic Speech Recognition</b>	634
Arkadiy Prodeus	

<b>Self-Consistent Effect of Ohmic Losses on Output Power of Gyrotron</b>	640
Vitalii I. Shcherbinin, Anton V. Hlushchenko	
<b>Estimation of Speech Quality and Intelligibility for Some Models of Additive Noise</b>	645
Arkadiy Prodeus	
<b>Shaped Nanoantennas on Cylindrical and Planar Substrate</b>	650
Alexander Ye. Svezhentsev, Vladimir Volski, Sen Yan, Guy A. E. Vandenbosch	
<b>An Approach To Triangulate Area Bounded Simple Polygons</b>	655
Vasyl Tereshchenko, Tania Kolianova, Yaroslav Tereshchenko	
<b>Effect of Electron Beam Irradiation on Structural and Electrical Properties of Graphene-SiO<sub>2</sub>-Si Structures</b>	659
A. Slobodyan, A. Vasin, D. Savchenko, V. Gorshkov, S. Tiagulskyi, Yu. Stubrov, P. Lytvyn, A. Nazarov	
<b>Resonance Scattering and Absorption of Light by a Silver Circular Cylinder with Diameter Larger Than the Wavelength</b>	663
Elena A. Velichko	
<b>Application RCWA for Studying Plasmon Resonance Under Diffraction by Metal Gratings</b>	667
Fitio V., Yaremchuk I, Bendzyak A., Bobitski Ya.	
<b>Mode Selective Properties of the Multi-ring Diaphragms in a Dielectric Waveguide</b>	671
O.V. Gurin, A.V. Degtyarev, M.N. Legenkiy, V.A. Maslov, V.N. Ryabykh, V.S. Senyuta, A.N. Topkov	
<b>Expanded Calibration of the MEMS Inertial Sensors</b>	675
V.V. Avrutov, P.M. Aksonenko, N.I. Bouraou, P. Henaff, L. Ciarletta	
<b>Discrete Models Characteristics of the Acoustic Emission Signal Origin Forerunners</b>	680
Marasanov V.V., Sharko A.A.	
<b>Method of Determining the Strain Value From the Output Signal of the Fiber Optical Sensor</b>	684
S.O. Tsybulnyk, D.O. Pivtorak	
<b>Mathematical Model of Volume Optical Interconnection Reconfiguration Utilizing Acousto-Optic Beam Forming</b>	688
V.S. Tkachenko, A.Y. Lipinskii	
<b>Heat Transfer Limitations of Heat Pipes for a Cooling Systems of Electronic Components</b>	692
R.S. Melnyk, Yu.E. Nikolaenko, Ye.S. Alekseik, V.Yu. Kravets	
<b>Analysis of Sigma-Delta Modulator with Distributed Feedback</b>	696
Vitalii Artuhov, Oleksii Brytov	
<b>Nonlinear Spin Wave Excitation at the Interface Between Two Ferromagnets with Broken Spatial Inversion Symmetry</b>	700
Yuliia Gusieva, Oksana Gorobets	
<b>Modeling the Deterministic Chaos Microelectronic Oscillator Based on the Bipolar Transistor Structure with Negative Resistance</b>	704
Andriy Semenov, Oleksandr Osadchuk	
<b>Sensors Element on Base of the Relief Au-Coated GaAs Grating</b>	709
I. Yaremchuk, H. Petrovska, V. Fitio, Ya. Bobitski, E. Sheregii, R. Wojnarowska-Nowak	
<b>Study of Phase Composition in the Technologically Modified MgO-Al<sub>2</sub>O<sub>3</sub> Nanoceramics Using XRD And XPS Mehods</b>	713
Halyna Klym	
<b>Gold-Coated Polycarbonate Grating-based Substrates for Raman Spectroscopy</b>	717
Yaremchuk I., Petrovska H., Bobitski Ya., Bobitski Ya., Sheregii E., Wojnarowska-Nowak R.	

<b>Numerical Method for Processing Frequency Measuring Signals from Microelectronic Sensors Based on Transistor Structures with Negative Resistance</b>	721
Oleksander Osadchuk, Andriy Semenov, Oleksander Zviahin, Anton Savvitskyi	
<b>Basic Ideas of Quantum Mechanics of Open Systems in Application to Electron and Optic Processes</b>	726
Sergiy F. Lyagushyn, Alexander I. Sokolovsky, Volodymyr V. Yarliuk, Sergey A. Sokolovsky	
<b>Modified Humidity-Sensitive Ceramics For Microelectronics Studied By PALS System</b>	732
Halyna Klym, Roman Dunets, Andriy Ivanusa, Yuriy Kostiv, Iryna Yurchak	
<b>Elemental Composition and Luminescent Characteristics of ZnS:Cu Powders, Obtained by Self-Propagating High-Temperature Synthesis Using NaCl as a Flux</b>	736
Yu.Yu. Bacherikov, O.B. Okhrimenko, A. Zhuk, R. Kurichka, A. Gilchuk, O. Shcherbyna, A. Musharovsky	
<b>Parametric Modeling of Conductivity in Percolating Nanotube Network</b>	740
Andriy Stelmashchuk, Ivan Karbovnyk, Dmytro Chalyy, Dmytro Lukashevych, Halyna Klym	
<b>Algorithm For Automated Diagnosis Of Object Technical State With Multimode Fiber Sensor</b>	744
Vasyl Varyshchuk, Yaroslav Bobitski	
<b>Lasing Thresholds of Plasmonic Modes of a Silver Tube Nanolaser with Active Shell and Core</b>	748
Denys Natarov	
<b>Lasing Thresholds of Plasmon and Grating Modes of Coated Silver Nanowire Gratings</b>	752
Volodymyr O. Byelobrov	
<b>Low-Noise High-Speed Si Nanowire Field-Effect Transistors: Recent Advances and Opportunities in Biosensor Applications</b>	756
S. Vitusevich	
<b>X-band Pulse Coaxial Magnetron with Field and Secondary Emitters</b>	762
V.D. Yeryomka, V.P. Dzyuba	
<b>Polarization Conversion by Metamaterial Composed of a Periodic Array of Metallic Square Helixes Embedded in a Dielectric Layer</b>	766
Vladimir V. Yachin, Tatiana L. Zinenko	

## Track 5: Systems Analysis, Computer Science & InfoCommunications

<b>Ontology-Supported Enterprise Architecture Analysis</b>	771
Murat Pasa Uysal, Murat Karakaya	
<b>Systematization of Problems of Automated Control in Cognitive Maps' Impulse Processes for Complex Systems</b>	776
Victor Romanenko, Yuriy Milyavsky	
<b>Fast ReRoute Scalable Solution with Protection Schemes of Network Elements</b>	783
Oleksandra S. Yeremenko, Oleksandr V. Lemeshko, Nadia Tariki	
<b>Forming the Logical Conclusion about Sufficiency of Information of Software Requirements Specification for Software Quality Assessment by ISO 25010:2011</b>	789
Tetiana Hovorushchenko	
<b>Dynamic Processes Forecasting and Risk Estimation Under Uncertainty Using Decision Support</b>	795
Bidyuk Petro, Terentiev Oleksandr, Prosyankina-Zharova Tatyana	

<b>A Deep Cascade Neural Network Based on Extended Neo-Fuzzy Neurons and its Adaptive Learning Algorithm</b>	801
Zhengbing Hu, Yevgeniy V. Bodyanskiy, Oleksii K. Tyshchenko	
<b>The Neuro-Fuzzy Controller for Handover Operation in Mobile Networks</b>	806
Olena Semenova, Andriy Semenov	
<b>Monte-Carlo Tree Search with Tree Shape Control</b>	812
Oleksandr I. Marchenko, Oleksii O. Marchenko	
<b>Pairwise Kernel-Based Preference Learning for Multiple Criteria Decision Making</b>	818
Leonid Lyubchyk, Galina Grinberg	
<b>Analysis of Quantization Noises in Multistage Signal Processing Systems: a Case Study of Digital Down Converters (DDC)</b>	822
Mykola Pavlenko, Alexander Kalyuzhny	
<b>Using Multidifferential Transducer for Pulsed Eddy Current Object Inspection</b>	826
Kuts Y., Protasov A., Lysenko I., Dugin O., Bliznuk O., Uchanin V.	
<b>A Decision Support System for Evaluation of Decision Alternatives on Basis of a Network Criteria</b>	830
Nataliya D. Pankratova, Nadezhda I. Nedashkovskaya	
<b>Symmetric Ternary Functions and their Application in Orthogonal Transforms</b>	836
Artem Izmailov, Lubomyr Petryshyn	
<b>The Use of Asynchronous Cellular Automata Models to Remove Noise From an Image</b>	842
Ivan Myroniv, Sergey Ostapov, Volodymyr Zhikharevich	
<b>Detecting Outliers in Multivariate Non-Gaussian Data on the basis of Normalizing Transformations</b>	846
Sergiy Prykhodko, Natalia Prykhodko, Lidiia Makarova, Kateryna Pugachenko,	
<b>The Decision Support System for the Classification of Allergenic Pollen Types Based on Fuzzy Expert Data of Pollen Features on the Microscope Images</b>	850
Vitalii B. Mokin, Oleksii M. Kozachko, Victoria V. Rodinkova, Olena O. Palamarchuk, Tetyana Y. Vuzh	
<b>Ukrainian Cropland through decades: 1990-2016</b>	856
N. Kussul, A. Kolotii, T. Adamenko, B. Yailymov, A. Shelestov, M. Lavreniuk	
<b>Exploring the Vector Space Model for Online Courses</b>	861
Roman Shaptala, Anna Kyselova, Gennadiy Kyselov	
<b>Method for Analyzing and Optimizing the Topologic Observability of Cognitive Maps of Complex Spatially Distributed Systems</b>	865
Vitalii Mokin, Ilona Varchuk, Kostiantyn Bondaletov, Olena Slobodianuk	
<b>Method for Selecting the Ranking Criteria for Monitoring Stations of the Status of Spatially Distributed Systems and for Defining the Priority of their Location</b>	870
Vitalii B. Mokin, Liubov M. Skoryna, Andrii R. Yascholt, Yevhenii M. Kryzhanivskiy	
<b>An IoT Application for Locating Victims Aftermath of an Earthquake</b>	876
Murat Karakaya, Gökhan Şengül, Erhan Gökçay	
<b>Demultiplexing of Optical Channels Based on the Effect of Light Scattering</b>	881
Manko Oleksandr, Vakas Vyacheslav	
<b>Evolution of Stability of Synchronization Parameters in Packet Networks</b>	886
Vakas Vyacheslav, Domin Dmytro, Manko Oleksandr, Kulinskyi Oleksii	
<b>Improvement of Data Transmission Reliability in Wireless Sensor Networks on The Basis of Residue Number System Correcting Codes Using the Special Module System</b>	890
Vasyl Yatskiv, Taras Tsavolyk	
<b>Analysis of Multivariable Regulation Systems Using Pseudo-Inverse Model-Based Controllers</b>	894
Leonid S. Zhiteckii, Klavdiia Yu. Solovchuk	

<b>Fake News Detection Using Naive Bayes Classifier</b> Mykhailo Granik, Volodymyr Mesyura	900
<b>Ternary Reversible/Quantum Latches</b> Zhengbing Hu, Ivan Yuriychuk, Vitaly Deibuk	904
<b>Availability Assessment of a Telecommunications System with Permanent and Intermittent Faults</b> Vladimir Ulansky, Irina Terentyeva	908
<b>Impact of SAR Data Filtering on Crop Classification Accuracy</b> M. Lavreniuk, N. Kussul, M. Meretsky, V. Lukin, S. Abramov, O. Rubel	912
<b>Web-Based Application to Collect and Analyze Users Data for Keystroke Biometric Authentication</b> Alieksieiev Vasyl, Elena Sharapova, Olena Ivanova, Gorelov Denis, Synytsia Yuliia	917
<b>Portfolio Management Model Of IT-Projects</b> Konstantin V. Koshkin, Natalia R. Knyrik, Viktor K. Partas, Pavel V. Nikitin	923
<b>Application of Concave Diffraction Grating for Increasing Data Capacity of Polymer Optical Fiber</b> Lyubomyr V. Bartkiv, Yaroslav V. Bobitski	927
<b>A Set of Instructions for Data Flow Virtual Machine</b> Kostyantyn Kharchenko, Oleksandr Beznosyk, Valeriy Romanov	931
<b>The Decision Making Mechanisms in Sea Container Traffic Management</b> Anatoly J. Gaida, Tigran G. Grigorian, Elena A. Zarichuk, Konstantin V. Koshkin	935
<b>Improved Method of Group Decision Making in Expert Systems Based on Competitive Agents Selection</b> Kolpakova T., Oliinyk A., Lovkin V.	939
<b>Single-Frame Image Super-Resolution based on Singular Square Matrix Operator</b> Yurii Rashkevych, Dmytro Peleshko, Olena Vynokurova, Ivan Izonin, Natalia Lotoshynska	944
<b>Information Systems Development For Open Data Analysis</b> Oleh Kovaliuk, Dmytro Kovaliuk	949
<b>Formation of the Multifractal Hypergraph Structure Reflecting the Self-Similarity Properties of the Computational Complexity Classes</b> Artem Potebnia	953
<b>Optimization of VoIP network performance</b> Alexander Soloviev, Victor Bondarenko	959
<b>Automatic Histogram-based Contrast Enhancement for Low-contrast Images with Small-sized Objects</b> Elena S. Yelmanova	965
<b>Method of Hierarchical QoS Routing Based on Network Resource Reservation</b> Oleksandra S. Yeremenko, Oleksandr V. Lemeshko, Olena S. Nevzorova, Ahmad M. Hailan	971
<b>Estimation of LTE Performance for Delivery of Multimedia Broadcasting Signals</b> Oleg Gofaizen, Baliar Vladimir	977
<b>The Use of ART-2 Neural Network for Processing Information Signals of Non-Destructive Testing</b> R.M. Galagan, A.S. Momot	981
<b>Analysis of the Frequency Parameters of the New Combined Microwave Radio System</b> V.N. Pochernyaev, V.S. Povhleb	986
<b>Investigation and Simulation of System for Data Flow Processing in Multiservice Nodes Using Virtualization Mechanisms</b> Mykhailo Klymash, Vasyl Romanchuk, Mykola Beshley, Polishuk Arthur	989
<b>The Authentication Method In Wireless Sensor Network Based On Trust Model</b> Olesia Voitovych, Leonid Kupershtein, Olga Shulyatitska, Viktor Malyushytskyy	993

<b>Improvement of the Method of Building Dynamic Models of Technological Processes</b> Kseniia Yashyna, Katerina Yalova	998
<b>Automatized Computer System for Evaluation of Rust Using Modified Single-Scale Retinex</b> Roman Vorobel, Iryna Ivashenko, Olena Berehulyak	1002
<b>Analysis of Observed-Based Control Systems with Unmeasured Disturbance</b> Olga Tolochko	1006
<b>Application Perfected Wave Tracing Algorithm</b> Mariya Nazarkevych, Yuriy Kynash, Roman Oliarnyk, Ivanna Klyujnyk, Hanna Nazarkevych	1011
<b>A Method for Synchronous Dataflow Retiming</b> Anatolij Sergiyenko, Anastasia Serhienko, Andriy Simonenko	1015
<b>Automated Composition of Petri Net Models for Cellular Structures</b> Shmeleva T.R.	1019
<b>Real-Time System for Indoor User Localization and Navigation using Bluetooth Beacons</b> Ievgen Gorovyi, Alexey Roenko, Alexander Pitertsev, Ievgen Chervonyak, Vitalii Vovk	1025
<b>Robust Synthesis of Two-degree-of-freedom System for Stabilization of Ground Vehicle</b> O.A. Sushchenko, Y.V. Beliavtsev	1031
<b>Approximate Spatial Model Based on Fuzzy-Rough Topology for Real-Time Decision Support Systems</b> Vladimir Sherstjuk, Maryna Zharikova, Igor Sokol	1037
<b>Two-Stage Method of Fuzzy Rule Base Correction for Variable Structure of Input Vector</b> Yuriy Kondratenko, Galyna Kondratenko, Ievgen Sidenko	1043
<b>Sentiment Analysis in the Ukrainian and Russian News</b> Victoria Bobichev, Olga Kanishcheva, Olga Cherednichenko	1050
<b>Generalized Formalization of Risks for Dynamic Risk Management Problems</b> Lev Korshevniuk	1056
<b>Data Mining of Relationship in Crowdsourcing Projects and Social Activities of Citizens</b> Viktor Putrenko	1060
<b>Statistic Metrics for Evaluation of Binary Classifiers without Ground-Truth</b> Maksym Fedorchuk, Bart Lamiroy	1066
<b>Clustering of Users in Social Networks by Their Activity</b> Viktor Hozhyi, Bart Lamiroy	1072
<b>Modeling of the TIF Processes in Binary Numeral Systems Based on the Vector-Branching Diagrams</b> M. Petryshyn	1078
<b>Toward Development of Neural Networks with Strong Anticipation</b> Alexender .Makarenko	1084
<b>No-reference Contrast Metric for Complex Images</b> Elena S. Yelmanova, Yuriy M. Romanyshyn	1088
<b>Corrosion Damage Estimation of Microstructure of Electric Arc Coating of Al-Mn Alloy in the Initial State and with PEO Coatings</b> Volodymyr Posuvailo, Iryna Ivashenko	1094
<b>Pipe Weld X-ray Image Distortion Removal</b> Teodor Mandziy	1099
<b>Load Balancing Based on Multi-Hop Handover for Wireless Cellular Networks</b> Roman Bak, Orest Lavriv, Bohdan Koval	1103

<b>Transport Network Optimization Methods of Mobile Operators in Ukraine</b>	1107
Roman Odarchenko, Yurii Kochergin, Anastasiia Abakumova, Dmitry Vergeles	
<b>Modeling and Investigating The Behavior of Complex Socio-Economic Systems</b>	1113
Michael Zgurovsky, Andrii Boldak, Kostiantyn Yefremov, Ivan Pyshnograiev	
<b>Energy-Efficient Method for Controlling the Transmitters Power of Wireless Sensor Network</b>	1117
Volodymyr Kochan, Anatoliy Sachenko, Vasyl Yatskiv, Orest Kocha	
<b>Approaches to the Evaluation of Spectral and Energy Efficiency Millimeter Wave Cellular Networks</b>	1121
Yana Kremenetskaya, Elena Zhukova, Svetlana Morozova	
<b>Advances in Hypercomplex Adaptive Filtering for 3D Audio Processing</b>	1125
Francesca Ortolani, Michele Scarpiniti, Danilo Comminiello, Aurelio Uncini	
<b>RDMA-based Dataflow Management System</b>	1131
Vladyslav Kucher	
<b>The Integrated System of Safety and Survivability Complex Technical Objects Operation in Conditions of Uncertainty and Multifactor Risks</b>	1135
Nataliya Pankratova	
<b>Parametric analysis of the input circles of measuring transducers of galvanostatic type impedance</b>	1141
Grygoriy Barylo, Roman Holyaka, Volodymyr Virt, Fedir Vezyr, Zenon Hotra	
<b>Model of Multicast Routing With Support of Shared Explicit Reservation of Link Resources</b>	1145
Amal Mersni, Andriy Ilyashenko, Tetiana Vavenko	
<b>A Simple Way to Broaden Objects Search Area for Tracking Methods Based on Discriminative</b>	1149
Anton Varfolomiciev, Oleksandr Lysenko	
<b>A Formal Proof of Properties of a Presentation System using Isabelle</b>	1155
Taras Panchenko, Ievgen Ivanov	
<b>Rule-based Algorithmic Approach for Solving Problems of Impact Analysis in Access Networks</b>	1161
Oleksandr Rolik, Eduard Zharikov, Valerii Kolesnik, Maxim Yasochka	
<b>Optimization on Polyhedral-Spherical Sets: Theory and Applications</b>	1167
Oksana Pichugina, Sergey Yakovlev	
<b>Speaker Verification with Mostly Voiced Speech for GMM/UBM and GMM/IBM Systems</b>	1175
Vadim Ditlovich, Yuval Bistriz	
<b>Unranked Tableaux Calculus for Web Related Applications</b>	1181
Besik Dundua, Lia Kurtanidze, Mikheil Rukhaia	

## Track 6: Engineering Education & History

<b>Electronic Materials Science: Teaching in Technical University</b>	1186
Y. Poplavko, Y. Yakimenko	
<b>Power Electronics Laboratory Education: the JUST Experience</b>	1191
Osama S. Saadeh, Moh'd Rashad D. Al-Mothafar	
<b>Hollow Cathode Glow Discharge as a Heating Source in Welding and Brazing</b>	1197
Gennady P. Bolotov, Maksym G. Bolotov, Iryna V. Nahorna	
<b>Joint Innovative Double Degree Master Program «Energy-Saving Technologies in Transport»</b>	1203
Andrey Gnatov, Schasyana Argun, Olga Ulyanets	

<b>Using Microservices in Educational Applications of IT-Company</b> Yevhen Berkunskyi, Kateryna Knyrik, Tetyana Farionova, Tetiana Smykodub	1208
<b>Academic Integrity Support System for Educational Institution</b> Maryna Zharikova, Vladimir Sherstjuk	1212
<b>Innovative Technologies in Laboratory Workshop for Students of Technical Specialties</b> Mykhaylo Zagirnyak, Serhii Serhiienko, Oleksii Chorny	1216
<b>Hands-on Workshops Method in Embedded Electronic Systems' Classes</b> A.N. Rudiakova, F.J. Yanovsky	1221
<b>Yevgeny M. Kuleshov, Human Delta-Function in Ukrainian Microwave Science and Technology</b> Tatiana L. Zinenko	1225
<b>Kinect based System for Student Engagement Monitoring</b> Urban Burnik, Janez Zaletelj, Andrej Košir	1229
<b>Microwave Physics and Technologies: History and Results of Collaboration of Teams from Ukraine, Germany and China Starting in 2000s</b> N.T.Cherpak, S.A.Vitusevich, Y.-S.He	1233