

# Table of Contents

## Technical Papers

Paper #	Title	Authors	Page
<b>Track 1: Microwave Techniques, Antennas &amp; Radar Systems</b>			
7	Comparison of CNNs for Lung Biopsy Images Classification	<i>Daria Hlavcheva, Vladyslav Yaloveha, Andrii Podorozhniak and Heorhii Kuchuk</i>	1
13	Microstrip Antenna with Complex Topology Fed by Coplanar Line	<i>Dmitriy Mayboroda, Sergey Pogarsky and David Korsakov</i>	6
21	Development of Neural Network for Cyclohexane Oxidation Data Processing	<i>Taras Chaikivskyi, Bohdan Sus, Olexander Bauzha, Sergiy Zagorodnyuk and Viktor Reutskyy</i>	10
30	Waveguide Polarizer for Radar Systems of 2 cm Wavelength Range	<i>Iryna Fesyuk, Stepan Piltyay, Andrew Bulashenko and Oleksandr Bulashenko</i>	15
34	Modern Microwave Polarizers and Their Electromagnetic Characteristics	<i>Vadym Shuliak, Stepan Piltyay, Andrew Bulashenko, Igor Zabegalov and Oleksandr Bulashenko</i>	21
37	Measurements of the Cubic Anisotropy Field in the (111) Thin Magnetic Films	<i>Maksym Popov and Igor Zavisllyak</i>	27
38	Electrodynamical Model of Linear Array Consisting of Inclined Semitransparent Elements	<i>Mykhayko Andriychuk and Victor Tkachuk</i>	31
39	Far-Field Characteristics of Discrete Parabolic Reflector Made of Circular PEC Wires, Symmetrically Illuminated by Plane Waves	<i>Elena Velichko</i>	36
41	Adjustable Iris-Post Waveguide Polarizer for Ku-band Satellite Uplink Systems	<i>Yelyzaveta Kalinichenko, Andrew Bulashenko, Stepan Piltyay and Oleksandr Bulashenko</i>	40
43	Characteristic Impedances of Rectangular and Circular Waveguides for Fundamental Modes	<i>Yevhenii Herhil, Stepan Piltyay, Andrew Bulashenko and Oleksandr Bulashenko</i>	46
45	Design and Simulation of Millimeter-Wave Magnetrons	<i>Mykhailo Kopot, Igor Kobzev, Grigorij Chetverykov, Alexander Gritsunov and Anzhela Bilotserkivska</i>	52
47	Influence of Contamination with Silicone Release Agent on the Ellipsometric Parameters of CFRP Surface in the Sub-THz Range	<i>Ivan Kolenov, Alexey Galuza, Alla Belyaeva, Sergey Mizrakhy, Pavel Nesterov and Alla Savchenko</i>	56
51	Study of Microwave Absorption in Foam Structures Using Microstrip Cells	<i>Leonid Filins'kyy</i>	60
52	Distributed Inductance Printed Antennas	<i>Sergey Bukharov, Dmitriy Svinarenko and Leonid Filins'kyy</i>	64
54	Influence of Colour Restoration on Rust Image Segmentation	<i>Teodor Mandziy, Iryna Ivasenko, Olena Berehulyak and Roman Vorobel</i>	68
57	Measurement of Diameter, Color Characteristics and Complex Refractive Index of Thin Fibers by Computer Analysis of Colors in an Image	<i>Nikolay Kokodii, Marina Kaydash, Irina Zhovtonizhko and Mykola Dubinin</i>	74
59	Compact Posts-Based Waveguide Polarizer for Satellite Communications and Radar Systems	<i>Alina Polishchuk, Andrew Bulashenko, Stepan Piltyay, Oleksandr Bulashenko and Igor Zabegalov</i>	78

Paper #	Title <i>Authors</i>	Page
63	Operator Method in Approximate Solution of Dielectric Waveguide Eigenwaves Scattering by Graphene Strips <i>Mstislav Kaliberda, Sergey Pogarsky and Lubov Kaliberda</i>	84
64	Operator Method in the E-Polarized Plane Wave Scattering by Coplanar Half-Plane and Disk: Basic Equations and Convergence <i>Mstislav Kaliberda, Sergey Pogarsky and Leonid Lytvynenko</i>	88
67	Electromagnetic Eigenvalue Problem for Twin Dielectric Rods Covered with Graphene: Symmetry Classes of the H-Polarized Supermodes <i>Dariia Herasymova, Sergii Dukhopelnykov and Tatiana Zinenko</i>	92
76	Enhanced Directionality of Emission of the On-Threshold Modes of a High Refractive Index Microdisk Laser Due to a Small Piercing Hole <i>Anna Repina, Ilya Ketov, Alina Oktyabrskaya, Alexander Spiridonov and Evgenii Karchevskii</i>	96
81	Single-Mode and Multimode Operation of the Rectangular Waveguide with a Spherical Ferrite Probe <i>Andriy Semenov, Dmytro Havrilov, Andrii Volovyk, Oleksandr Stalchenko, Roman Kulias and Dmytro Ilchuk</i>	100
89	Combline Bandpass Filter with Asymmetric Frequency Response and Extended Stopband <i>Sergii Litvintsev and Sergii Rozenko</i>	105
90	Synthesis of Waveguide Diaphragm Polarizers Using Wave Matrix Approach <i>Andrew Bulashenko, Stepan Piltyay, Oleksii Bykovskyi and Oleksandr Bulashenko</i>	111
92	Improvement of the Metrological Characteristics of Biomedical Temperature Sensors Based on Transistor Structures <i>Oksana Boyko, Kateryna Ilkanych and Viktoriia Maikher</i>	117
97	Lasing Eigenvalue Problem for a Circular Quantum Wire Partially Covered with Graphene <i>Sergii Dukhopelnykov, Tatiana Zinenko and Alexander Nosich</i>	121
105	Using KD-tree for Algorithm of Electromagnetic Scattering Calculation on Complex Shape Objects <i>Vlad Khrychov and Maxim Legenkiy</i>	126
108	Optimization of Data Processing Structure for Multi-Position Radar Surveillance Systems <i>Ivan Obod, Iryna Svyd, Oleksandr Vorgul, Oleksandr Maltsev, Oleksandr Datsenko and Natalya Boiko</i>	133
109	Optimal Measurement of Signal Data Parameters of Requesting Radar Systems <i>Iryna Svyd, Ivan Obod, Oleksandr Maltsev, Volodymyr Andrusevich, Borys Bakumenko and Oleksandr Vorgul</i>	138
110	Assessing SSR Relative Data Capacity <i>Ivan Obod, Iryna Svyd, Ganna Zavolodko, Oleksandr Maltsev, Borys Bakumenko and Valeria Chumak</i>	142
115	Triple-Band Dipole Antenna for Wireless Communication Systems <i>Sergey Berdnik, Victor Katrich, Mikhail Nesterenko and Oleksandr Dumin</i>	147
116	Radio Wave Characteristics Distorted During Geospace Storm: Results of Multi-Frequency Multiple Path Oblique Sounding of Ionosphere <i>Leonid Chernogor, Kostyantyn Garmash, Qiang Guo, Victor Rozumenko and Yu Zheng</i>	151
124	Optical Properties and Field Distribution of Spherical Copper Monosulfide Particles <i>Oleksandr Vernyhor, Tetiana Bulavinets, Volodymyr Fitio, Yaroslav Bobitski, Rostyslav Lesyuk and Iryna Yaremchuk</i>	157
125	Multi-Frequency Multiple Path Oblique Incidence Sounding of the Ionosphere Disturbed by Super Typhoon Motion <i>Leonid Chernogor, Kostyantyn Garmash, Qiang Guo, Yiyang Luo, Victor Rozumenko and Yu Zheng</i>	161

Paper #	Title <i>Authors</i>	Page
135	Subsurface Object Detection in Randomly Inhomogeneous Medium Model <i>Oleksandr Pryshchenko, Oleksandr Dumin, Vadym Plakhtii and Gennadiy Pochanin</i>	167
137	Basic Equations of the Lasing Eigenvalue Problem for Graphene Strips-on-Substrate Grating, H-Polarization <i>Fedir Yevtushenko, Sergii Dukhopelnykov and Tatiana Zinenko</i>	172
138	Frequencies and Thresholds of Transversal Plasmon Modes of the Laser Shaped as a Circular Quantum Wire Wrapped in Graphene Cover <i>Denys Natarov, Tetiana Zinenko and Anastasia Natarova</i>	177
150	DSP-based Cross-Correlator for the Analysis of Dynamic Light Scattering Data for Biomedical Investigation <i>Roman Yaremyk, Oleh Bordun and Vasyl Hetman</i>	181
154	Research of Improved Traffic Engineering Fault-Tolerant Routing Mechanism in SD-WAN <i>Oleksandr Lemeshko, Oleksandra Yeremenko, Maryna Yevdokymenko, Anna Zhuravlova, Anastasiia Kruhlova and Valentyn Lemeshko</i>	187
156	Direction Finding Accuracy for Ropucha-Class Landing Ship in Sighting along Missile Flight Trajectory <i>Oleg Sukharevsky, Vitaliy Vasilets, Sergey Nechitaylo, Gennady Zalevsky and Ivan Ryapolov</i>	191
<b>Special Session: Adaptive Antenna Arrays and Smart Antennas</b>		
14	Adaptive Arrays Based on Real-Valued Arithmetic Linearly-Constrained IQRD RLS Adaptive Filtering Algorithms <i>Victor Djigan</i>	196
15	Simple Algorithms for Antenna Array Calibration and Their Accuracy <i>Victor Djigan and Vladislav Kurganov</i>	202
16	Application of Affine Projection Algorithm in Adaptive Arrays <i>Victor Djigan</i>	208
80	Simulation of Four- Directional Spoofing Suppression with Five-Element Antenna Array <i>Oleksandr Kutsenko, Yuliya Averyanova and Valeriy Konin</i>	213
121	Analysis of Influence of Number of Sensors on Accuracy of Radio Source Position Determination Based on TDOA-, RSS- and AOA- Measurements <i>Igor Tovkach, Serhii Zhuk, Oleksandr Neuimin and Viacheslav Chmelov</i>	217
136	Software Implemented Enhanced Efficiency BPSK Demodulator Based on Perceptron Model with Randomization <i>Ihor Lazarovych, Mykola Kozlenko, Mykola Kuz, Valerii Tkachuk, Mariia Dutchak, Ivan Savka and Mykola Pikuliak</i>	221
141	Satellite Image Segmentation Using Deep Learning for Deforestation Detection <i>Petro Vorotynsev, Yuri Gordienko, Oleg Alienin, Oleksandr Rokovy and Sergii Stirenko</i>	226
155	Development of Broadband Criterion for Spatially Distributed Radio Systems Synthesis <i>Volodymyr Pavlikov, Valeriy Volosyuk, Simeon Zhyla, Eduard Tserne, Olexandr Shmatko and Anton Sobkolov</i>	232
<b>Special Session: UWB Signals, Signal Processing &amp; Electromagnetic Compatibility</b>		
23	High-Power Impulses with Nanosecond Fronts Obtaining Using Forming Lines on Nonlinear Electronic Elements <i>Oleg Rezinkin, Marina Rezinkina, Andrey Danyluk and Alexey Guchenko</i>	237
42	Algorithm Of Two-Stage Channel Frequency Response Estimation In OFDM Systems Based On Kalman Filter <i>Oleksandr Myronchuk, Oleksandr Shpylka, Serhii Zhuk and Yurii Myronchuk</i>	241

Paper #	Title <i>Authors</i>	Page
88	Computer Processing of Signals of Noncontact Ultrasonic System <i>Valentyn Borulko and Viktor Gritsenko</i>	247
107	Wideband Diffraction Properties of Azimuthally Symmetric Grating with Different Geometry <i>Maxim Legenkiy</i>	252
142	UWB Antenna Arrays with the Monopole-Slot Radiator of Clavin Type <i>Pylyp Fomin, Oleksandr Dumin, Vadym Plakhtii and Nesterenko Mikhail</i>	258
143	GPR Data Processing Using the Synthesized Pulse Method <i>Dmitry O. Batrakov, Mariya Antyufeyeva, Mykola Kovalov and Angelika Batrakova</i>	262
<b>Track 3: Industrial and Power Electronics &amp; Energy Systems</b>		
3	Optimization of LED Drivers Depending on the Temperature of their Operation in Lighting Devices <i>Iryna Belyakova, Volodymyr Medvid, Vadim Piscio, Roman Mykhailysyn, Volodymyr Savkiv and Mariya Markovych</i>	266
8	Synthesis of a Regulator Recuperation Mode a DC Electric Drive by Creating a Process of Finite Duration <i>Volodymyr Nerubatskyi, Oleksandr Plakhtii and Svitlana Podnebenna</i>	272
10	Impulse Processes in the System of Electrodynamic Treatment of Welds <i>Yuriy Vasetsky and Igor Kondratenko</i>	278
11	Study of a Hybrid Photovoltaic Solar Station with High-Voltage Converters <i>Roman Zaitsev, Michail Kirichenko, Lilia Zaitseva, Oleg Chugai and Sergiy Oleynick</i>	282
12	The Features of the Active Battery Balancing Systems <i>Bohdan Styslo, Roman Zaitsev, Kseniia Minakova, Mykhailo Kirichenko, Oleksandr Ieresko and Vadym Makarov</i>	287
20	Binary Space Topology Features in Applying to Transitional States Generation of Asynchronous Finite State Machine <i>Volodymyr Bychko, Vasyl Bryukhovetsky, Viacheslav Gordienko and Roman Yershov</i>	293
24	Diagnosis of Oil-Filled Equipment with X-Wax Deposition Based on Dissolved Gas Analysis <i>Oleg Shutenko and Oleksii Kulik</i>	299
26	Analysis of the Electrical Networks Functioning Quality of with Photovoltaic Power Plants <i>Petro Lezhniuk, Olena Rubanenko and Jean-Pierre Ngoma</i>	305
28	Correction of the Maximum Permissible Values of the Oil Acidity by the Minimum Risk Method <i>Oleg Shutenko and Serhii Ponomarenko</i>	310
31	Traction Substation Transformer Power Distribution Investigation Under Asymmetric and Nonlinear Loading Conditions <i>Maksim Bezzub, Olexii Bialobrzheshkyi, Oleh Todorov and Ihor Reva</i>	316
33	Simultaneous Competition Modeling of Generations and Consumers in The New Market Structure Based on The Supply Function Equilibrium Model Systems <i>Masoud Dashtdar, Olena Rubanenko, Vladislav Kuchanskyy, Seyed Mohammad Sadegh, Irfan Sami and Mohit Bajaj</i>	321
36	Dual Battery Powered Drive System Using an Open-End Winding Brushless DC Motor <i>Ihor Shchur, Valentyn Turkovskyi and Bohdan Boichuk</i>	327
44	Analysis of the Magneto-Mechanical Characteristic of Double Three-phase PMSM <i>Oleksandr Makarchuk, Bohdan Kharchyshyn and Lidiia Kasha</i>	333
48	Shaft Run-Out Optical Remote Sensing System For Large Generator Fault Diagnosis <i>Ievgen Zaitsev</i>	339

Paper #	Title <i>Authors</i>	Page
49	Constant-Parameter Discretized State-Space Model of Saturable Induction Machines for Fixed Time-step Simulations <i>Navid Amiri, Seyyedmilad Ebrahimi and Juri Jatskevich</i>	343
55	Magnetization of the Magnetic Circuit of an Induction Motor with Massive End Ferromagnetic Screens <i>Nataliya Krasnoshapka and Pushkar Mykola</i>	349
60	Research of Transition Processes of Single-Phase Collector Motor With AC Voltage Controller Model Created on Project Design Data <i>Bohdan Kopchak and Andrii Kushnir</i>	353
69	The Optimization of PV-plant's DC/AC Equipment Ratio Using the Non-linear Least-cost Model <i>Ihor Buratynskyi, Tetiana Nechaieva, Sergii Shulzhenko and Natalia Ivanenko</i>	358
70	Three-Dimensional Pulsed Electromagnetic Field of Current Near Conducting Half-Space <i>Yuriy Vasetsky</i>	363
73	An Universal Bidirectional Three-Port DC/DC/AC Converter With Isolated AC Port <i>Vladimir Burlaka, Sergey Gulakov, Svetlana Podnebennaya, Ekaterina Kudinova, Oleksandr Plakhtii and Volodymyr Nerubatskyi</i>	367
86	Accounting For The Effect Of PV Panel Dustiness On System Performance With Correction For Panel Cleaning For Matlab Simulink <i>Dmytro Danylchenko, Sergiy Shevchenko, Oksana Dovgalyuk, Olena Rubanenko, Stanislav Fedorchuk and Andrii Potryvai</i>	373
93	Sensorless Speed Control of the Surface Mounted Permanent Magnet Synchronous Motors <i>Sergei Peresada, Dmytro Rodkin and Volodymyr Pyzhov</i>	379
95	Method for Calculation of Parameters of Controlled Compensating Devices Extra High Voltage Power Lines <i>Vladislav Kuchanskyy, Ievgen Zaitsev, Mohit Bajaj, Olena Rubanenko and Iryna Hunko</i>	385
101	Improvement of the Mathematical Model of Low-Frequency Electromagnetic Processes of Power Transformer using MATLAB/Simulink <i>Oksana Hoholyuk, Petro Gogolyuk and Olena Fuchyla</i>	391
106	Determination of Technical Condition of the Power Transformer by Frequency Response Analysis Method <i>Olena Rubanenko, Oleksandr Rubanenko, Mohit Bajaj and Maksim Hryshchuk</i>	395
112	Design Procedure of Static Characteristics of the Resonant Converters <i>Gennadiy Pavlov, Andrii Obrubov and Iryna Vinnychenko</i>	401
126	Sliding Mode Current Control Based on Space-Vector Operation Technique for Active Power Filter <i>Taras Mysak</i>	407
139	Transient Analysis in Three-Phase Cable Lines with the Transposition Phase Cables Conductive Screens During Short Circuit Fault <i>Vadim Lobodzinskyi</i>	413
147	Parameters Identification for Self- Commissioning of DC-DC Boost Converters <i>Sergei Peresada, Yevhen Nikonenko and Yurii Zaichenko</i>	417

#### Track 4: Industry Applications, Automation & Industry 4.0

- 2 Investigation of the Accuracy of the Base of the Object of Manipulation of Bernoulli Gripping Devices  
*Roman Mykhailysyn, Volodymyr Savkiv, Frantisek Duchon, Vadim Piscio, Volodymyr Medvid and Illia Diahowchenko* 421
- 6 Electromechanical Tracking System Based on a Fuzzy Position Controller  
*Yaroslav Paranchuk and Oleksiy Kuznyetsov* 426

Paper #	Title <i>Authors</i>	Page
19	Analysis of the Requirements to the Accuracy of Diffractively Reflecting Coatings Manufacturing <i>Serhii Herasymov, Yaroslav Kozhushko, Michaylo Pichugin, Albert Katunin, Oleg Kulakov, Olexii Roianov, Volodymyr Oliinik, Serhii Harbuz and Andrii Diakov</i>	431
22	Analysis of the Technological Production Defects Influence on Response Function of Shaft Run-Out Sensor for Generator Fault Diagnosis System <i>Ievgen Zaitsev, Anatolii Levytskyi and Viktoriia Bereznychenko</i>	435
53	Simulation of the Influence of Smart Grid Users in Smart City on the Operation of a Single-phase Distribution Transformer <i>Ihor Reva</i>	439
72	Gimballed Attitude and Heading Reference System for Marine Vehicles <i>Olha Sushchenko</i>	445
102	Formation of an Optimal Trajectory for Controlling the Active Power of an Electric Arc Furnace <i>Yashyna Kseniia, Yalova Katerina and Sadovoy Oleksandr</i>	450
<b>Track 5: Nanotechnologies, Photonics, Electron Devices &amp; Magnetics</b>		
1	The Annealing Effect on the Structure and Microstructure of 3D Printed Zinc Oxide Films <i>Vladyslav Yevdokymenko, Oleksandr Dobrozhany, Roman Pshenychnyi, Stanislav Kakher斯基, Anatoliy Opanasyuk and Yuriy Gnatenko</i>	454
4	Systems Ignition Device for High-Pressure Gas Discharge Lamps Based on Voltage Piezoelectric Transformer <i>Iryna Belyakova, Volodymyr Medvid, Vadim Piscio, Roman Mykhailysyn, Volodymyr Savkiv and Mariya Markovych</i>	459
9	Photoelectrical Properties of the Cu <sub>2</sub> O/CdTe Heterostructure <i>Ivan Koziarskyi, Eduard Maistruk and Dmytro Koziarskyi</i>	465
65	Electromagnetic Eigenvalue Problem for a Graphene Strip Placed in the Center of a Circular Dielectric Rod: Hypersingular Integral Equations and Symmetry Classes <i>Oleksii Kostenko and Tetyana Zinenko</i>	469
66	Mechanisms of Structural Degradation of Oxymanganospinel Ceramics for Active Elements of Temperature Sensors <i>Halyna Klym, Ivan Hadzaman and Yuriy Kostiv</i>	474
71	Plasma Electrolytic Oxidation of Al: Structure and Properties of Coatings <i>Denis Vinnikov, Vladimir Yuferov, Ivan Kolenov, Sergey Mizrakhy, Igor Vysekantsev and Iryna Buriak</i>	478
77	Advanced Heat Transfer Model of PV/T System <i>Kseniia Minakova and Roman Zaitsev</i>	482
104	Research of Dispersed Media Optical Properties by Photothermal Interference Method <i>Halyna Petrovska, Tetiana Bulavinets, Iryna Yaremchuk, Volodymyr Fitio and Yaroslav Bobitski</i>	486
122	Search For The Ways To Implement A Hybrid Method For Obtaining A Hardening Composite Coating With Onion-Like Carbon And Metal Carbides During Electric Explosion Of Electrical Conductors <i>Natalia Nazarova, Dmytro Vinnychenko and Leonid Boguslavskiy</i>	490
123	Influence of Technological Features of Formation of Humidity-sensitive Thick-film Structures on Their Functionality <i>Halyna Klym and Ivan Hadzaman</i>	496
128	Effect Changing of Nanopore Volumes in MgAl <sub>2</sub> O <sub>3</sub> Ceramics under the Influence of Water <i>Halyna Klym, Ivan Karbovnyk and Yuriy Kostiv</i>	500
144	Impact Ionization in Graded Gap Transferred Electron Diode <i>Oleg Botsula, Kyrylo Prykhodko and Valerii Zozulia</i>	504

Paper #	Title <i>Authors</i>	Page
148	Development of Piezoresistive Materials Based on Elastic Polyurethanes and Carbon Nanotubes for Sensor Devices <i>Eduard Lysenkov</i>	509
157	Lipid Nanocarriers Impede Side Effects of Delivered Antimicrobial Peptide <i>Volodymyr Berest, Anatolii Sotnikov and Larysa Sichevska</i>	513
<b>Track 6: Systems Analysis, Reliability, Computer Science &amp; Communications</b>		
5	Modeling the Process of Loading Impact on Web Servers in Computer Systems <i>Oleksandr Khoshaba, Viktor Grechaninov, Anatoliy Lopushanskyi and Kostiantyn Zavertailo</i>	519
17	Estimation of the Bandwidth of the Communication Channel of 5G Networks Based on Small Cells <i>Oleksandr Tsopa, Oleksandra Dudka, Anatolii Merzlikin and Nikolay Ruzhentsev</i>	525
18	Improving the Information Security of Modern Telecommunications Networks <i>Hanna Antoniuk, Mikola Vasylkivskyi and Olha Poludenko</i>	530
25	Substantiation of Probability Characteristics for Efficiency Analysis in the Process of Radio Equipment Diagnostics <i>Oleksandr Solomentsev, Maksym Zaliskyi, Ivan Yashanov, Olga Shcherbyna, Olha Sushchenko, Felix Yanovsky, Ivan Ostroumov, Yuliya Averyanova and Nataliia Kuzmenko</i>	535
78	Two-Point Probability Functions and Correlation Properties of the Generalized Additive High-Order Markov Chains <i>Galyna Prytula, Oleg Usatenko and Vadym Vekslerchik</i>	541
96	Study of the Convergence of Muller's Sequence Computer Calculations <i>Oleh Vietrov and Rostyslav Bilous</i>	547
99	Mathematical Modeling of Online Transaction Processing System for Design of Building Territory <i>Tetyana Honcharenko, Oleksandr Terentyev, Kateryna Kyivska, Ievgenii Gorbatyuk, Elena Dolya and Mariia Liashchenko</i>	552
100	Modular Multiplier for Digital Quantum Coprocessor <i>Valeriy Hlukhov</i>	557
127	Diagnosis of Lung Disease Based on Medical Images Using Artificial Neural Networks <i>Anastasiia Sheremet, Yuriy Kondratenko, Ievgen Sidenko and Galyna Kondratenko</i>	561
131	Pagination And Its Efficient Methods For RESTful Web Services <i>Serhii Orlivskyi, Bohdan Deomin and Olga Averianova</i>	567
153	Software Implementation of Data Hiding in Vector Images <i>Alexandr Kuznetsov and Anna Kononchenko</i>	572
<b>Track 7: Engineering Education &amp; History</b>		
27	Historical Milestones in the Development and Creation of Radio Frequency Inductively Coupled Plasma Torches <i>Oleh Strelko, Yuliia Berdnychenko, Oleh Pylypcuk, Oksana Pylypcuk, Olena Sorochynska and Anatolii Horban</i>	578
83	Training of the Future Nanoscale Engineers: Methods for Selecting Efficient Solutions in the Nanostructures Synthesis <i>Yana Suchikova, Ihor Bohdanov, Sergii Kovachov, Iryna Bardus, Andriy Lazarenko and Gennadij Shishkin</i>	584
85	Historical Review of Technological CO <sub>2</sub> Lasers Development, Manufacturing and Operation Stages at E.O. Paton Electric Welding Institute of the NAS of Ukraine <i>Volodymyr Shelyagin, Artemii Bernatskyi, Oleksandr Siora, Taras Nabok, Natalia Shamsutdinova and Mykola Sokolovskiy</i>	589

Paper #	Title <i>Authors</i>	Page
87	Contribution of Yuzhnoye SDO to the Creation of Rocket and Space Technology under the Leadership of S. M. Koniukhov <i>Alla Lytvynko, Olena Voitiuk, Vira Gamaliia, Mariia Stankova, Olexandr Korniienko and Halyna Sichkarenko</i>	594
91	The Development of Electrical and Radio engineering: the Role of M. Krylov and M. Bogolyubov's Nonlinear Mechanics <i>Alla Lytvynko, Mariia Stankova, Olena Voitiuk, Olexandr Korniienko, Halyna Zvonkova and Artem Zabuga</i>	599
130	Dnieper Hydroelectric Station (DniproHES). The Story of the Largest Investment in the Electricity Industry in Europe in the Early XX Century <i>Dmytro Danylchenko, Alexander Koval, Victoria Koval, Sergii Radoguz, Kseniia Minakova and Stanislav Dryvetskyi</i>	604
<b>Author Index</b>		608