2018 Engineering and Telecommunication (EnT-MIPT 2018)

Moscow, Russia
15 – 16 November 2018

IEEE Catalog Number: CFP18S91-POD
ISBN: 978-1-7281-0433-1

****** 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: CFP18S91-POD
ISBN (Print-On-Demand): 978-1-7281-0433-1
ISBN (Online): 978-1-7281-0432-4

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
Web: www.proceedings.com

2018 Engineering and Telecommunication (EnT-MIPT)

EnT-MIPT 2018

Table of Contents

Preface xi
Conference Committees xii
Reviewers xiii

Telecommunication and Information Technology

Field Tests of Digital Terrestrial Multimedia Broadcasting System RAVIS 3
Alexander V. Dvorkovich (Moscow Institute of Physics and Technology), Viktor P. Dvorkovich (Moscow Institute of Physics and Technology), Vladimir A. Irtyuga (Moscow Institute of Physics and Technology), and Kirill S. Mityagin (Moscow Institute of Physics and Technology)

Soft-Decision Statistical Decoder for Coded DHA FH OFDMA 8
Alexey Kreshchuk (MIPT IITP RAS)

Methodology for Detecting Traces of Preparation for Cyber Attacks 12
Alexey N. Nazarov (Moscow Institute of Physics and Technology), Abhishek Vaish (Indian Institute of Information Technology), Ilia M. Voronkov (Moscow Institute of Physics and Technology), Sunakshi Singh (Indian Institute of Information Technology), and Nitish Kumar Ojha (Indian Institute of Information Technology)

The Approaches to Assessing the Quality and Security of Mobile Application Content 16
Alexey Nikolaevich Nazarov (MIPT), Ilia Mikhailovich Voronkov (MIPT, InterEVM), and Sergei Andreevich Zhestkov (MIPT)

Information Environment Elements of Digital Control Systems for Objects with Variable Functioning Model 20
Ba-Chung Le (Moscow Institute of Physics and Technology), Yuri A. Holopov (Lebedev Institute of Precision Mechanics and Computer Engineering), and Thi-Hong-Tham Tran (Moscow Institute of Physics and Technology)

Nonlinear Quantization Method for Wavelet-Based Video Codec 25
Dam Trong Nam (Moscow Institute of Physics and Technology), Gennady Yu. Gryzov (Moscow Institute of Physics and Technology), Alexander V. Dvorkovich (Moscow Institute of Physics and Technology), and Viktor P. Dvorkovich (Moscow Institute of Physics and Technology)

Clock Drift Impact on Target Wake Time in IEEE 802.11ax/ah Networks 30
Dmitry Bankov (Institute for Information Transmission Problems, Russian Academy of Sciences), Evgeny Khorov (Institute for Information Transmission Problems, Russian Academy of Sciences), Andrey Lyakhov (Institute for Information Transmission Problems, Russian Academy of Sciences), and Ekaterina Stepanova (Institute for Information Transmission Problems, Russian Academy of Sciences)

Identification of Objects with Partially Unobservable Influences 35
I. S. Durgaryan (Trapeznikov Institute of Control Sciences), F. F. Pashchenko (MIPT (State University)), T.A. Pham (MIPT (State University)), H.H. Do (MIPT (State University)), and A. F. Pashchenko (Trapeznikov Institute of Control Sciences)

Multicomponent Subspace Codes in Network Coding 40
E.M. Gabidulin (Moscow Institute of Physics and Technology (State University)) and N.I. Pilipchuk (Moscow Institute of Physics and Technology (State University))

Building Heuristic Scheduler for One-Machine Network Function Scaling 49
Ilya Philippov (Institute of Physics and Technology Moscow)

On the Maximal Code Length of Optimal Linear LRC Codes with Availability 54
Stanislav Kruglik (Skolkovo Institute of Science and Technology), Kamilla Nazirkhanova (Skolkovo Institute of Science and Technology), and Alexey Frolov (Skolkovo Institute of Science and Technology)

Optical Plasmon Sensor Based on ITO Nanoparticles 58
Valery A. Astapenko (Moscow Institute of Physics and Technology (State University)), Egor S. Manuilovich (Moscow Institute of Physics and Technology (State University)), Sergei V. Sakhno (Moscow Institute of Physics and Technology (State University)), Egor S. Khramov (Moscow Institute of Physics and Technology (State University)), and Evgeniya V. Sakhno (Moscow Institute of Physics and Technology (State University))

Improving Peak-to-Average Power Ratio Reduction for OFDM Signals Using Modified Tone Reservation and Clipping-and-Filtering Hybrid Scheme 61
Van-Nghia Tran (Moscow Institute of Physics and Technology) and Ngoc-Khoan Ha (108 Military Central Hospital)

Performance Evaluation for DTMB Receiver under VHF and UHF Bands 66
Xudong Zhang (Tsinghua University), Changyong Pan (Tsinghua University), Xia Hai (SAPPRFT), and Fang Yang (Tsinghua University)

Radio Communication and Radiolocation Systems

A Low-Profile Dual-Band Shared-Aperture Antenna System Based on Artificial Magnetic Conductor 73
Alexander P. Volkov (JSC Corporation Vega), Vitalii V. Kakshin (JSC Corporation Vega), Kirill V. Kozlov (JSC Corporation Vega), and Alexander P. Kurochkin (JSC Corporation Vega)

Ultrawideband Wireless Sensor Network for Real Time Process Monitoring ..76
Alexander S. Dmitriev (Kotel'nikov Institute of Radio Engineering and Electronics), Lev V. Kuzmin (Kotel'nikov Institute of Radio Engineering and Electronics), Anton I. Ryshov (Kotel'nikov Institute of Radio Engineering and Electronics), Yuri V. Andreyev (Moscow Institute of Physics and Technology(State University)), and Maxim G. Popov (Moscow Institute of Physics and Technology(State University))

About the Choice of Frequency Band of Partial Filters used in the Two-Band Method of Estimation of Total Electron Content of Ionosphere ..81
Alexey Stroev (Moscow Institute of Physics and Technology)

Remote Pointlike Dynamic Target Simulator for Laser Testing Jig Directing System ..85
Andrey N. Kleymenov (Public Joint-Stock Company) and Yanka I. Malashko (Moscow Institute of Phisycs Technology)

An Algorithm of the Hybrid Projection Method for Analysis of Axially Symmetric Excitation of an Inhomogeneous Dielectric Body of Revolution ..87
Ekaterina I. Poshisholina (Moscow Institute of Physics and Technology) and Sergei P. Skobelev (Moscow Institute of Physics and Technology)

Application of Spiral Antennas for Perspective Vehicle–Board Systems and Complexes ..91
Elchin Gadzhiev (Scientific and Research Institute of Electromechanics), Vladimir Skripachev (The Federal Center of Analyzis Moscow), Alexander Generalov (Scientific and Research Institute of Electromechanics), Yuri Polushkovskiy (The Federal Center of Analyzis Moscow), Mikhail Tumanov (Scientific and Research Institute of Electromechanics), and Alexander Zhukov (Sternberg Astronomical Institute)

Analysis of H-polarized Plane Wave Scattering by Inhomogeneous Dielectric Cylinder of Arbitrary Cross Section ..94
Elizaveta S. Nekrasova (Moscow Institute of Physics and Technology) and Sergei P. Skobelev (Moscow Institute of Physics and Technology)

Simulation of Polarization Scattering Matrices for Axisymmetric Objects of Control with the Use of a Complete Circular Basis ..99
Evgeniy G. Parinov (Moscow Institute of Physics and Technology (State University)), Artem A. Kopylov (Moscow Institute of Physics and Technology (State University)), and Igor V. Zimin (Moscow Institute of Physics and Technology (State University))

A Family of Optimal Cosine-Sum Windows for Real-Time Spectral Analysis ..103
Gennady V. Zaytsev (PJSC "ALMAZ R&P Corp.") and Alexander D. Khzmalyan (PJSC "ALMAZ R&P Corp.")

Air Target Detection in Pulsar FSR System ..108
Hristo Kabakchiev (Sofia University Sofia), Vera Behar (IICT-BAS Sofia), Ivan Garvanov (University of Library Studies and Information Technologies), Dorina Kabakchieva (University of National and World Economy), Magdalena Garvanova (University of Library Studies and Information Technologies), and Herman Rohling (TU Hamburg-Harburg)

The Construction Principle Development of Precision Laser-Interferometric Meter of Distances and Displacements .113
Iurii B. Minin (Fryazino Branch of Kotel'nikov Institute of Radio-Engineering and Electronics of RAS), Mstislav N. Dubrov (Fryazino Branch of Kotel'nikov Institute of Radio-Engineering and Electronics of RAS), and Ekaternina S. Krupnik (Institute of Physics and Technology (State University))

The Transient Response of -Filter for Tracking with LFM Waveforms .118
Mariya. A. Murzova (Moscow Institute of Physics and Technology) and Vladimir E. Farber (Moscow Institute of Physics and Technology)

A Conflict in the Radio Frequency Spectrum of LEO-HTS and HEO-HTS Systems .122
Valentin R. Anpilogov (Moscow Institute of Physics and Technology (State University)), Andrey A. Gritsenko (Moscow Institute of Physics and Technology (State University)), Yury N. Chekushkin (Moscow Institute of Physics and Technology (State University)), and Igor V. Zimin (Moscow Institute of Physics and Technology (State University))

Amplitude-Phase Synthesis of Controlled Nulls in Sum and Difference Patterns of Monopulse Planar Phased Antenna Array .126
Valery Kashin (Research and Production Corporation Almaz), Yury Hmelenko (Research and Production Corporation Almaz), and Irina Shurygina (Research and Production Corporation Almaz)

Waveguide to Coaxial Transition in Disk-on-Rod Feed Array Element .131
Vladislav V. Gavrilin (JSC "Radiofizika"), Yury V. Krivosheev (JSC "Radiofizika"), and Alexander V. Shishlov (JSC "Radiofizika")

Computing Technology and Systems

Evaluation of Cache Compression for Elbrus Processors .135
Aleksey S. Kozhin (AO "MCST") and Alexander V. Surchenko (Moscow Institute of Physics and Technology (MIPT))

State-of-the-Art and Problems in Development of Automated Screening Systems in Personalized Medicine and Oncology .140
Elena Petersen (Moscow Institute of Physics and Technology), Roman Gorbachev (Moscow Institute of Physics and Technology), Ekaterina Skorova (Moscow Institute of Physics and Technology), and Ivan Volkov (Moscow Institute of Physics and Technology)

Augmented Intelligence Framework for Protecting against Cyberattacks .143
Igor F. Mikhalevich (V. A. Trapeznikov Institute of Control Sciences of RAS) and Alexander P. Ryjov (V. A. Trapeznikov Institute of Control Sciences of RAS)

Evolutionary Structural Optimization Algorithm Based on FFT-JVIE Solver for Inverse Design of Wave Devices .146
Iurii B. Minin (Skolkovo Institute of Science and Technology), Egor E. Nuzhin (Skolkovo Institute of Science and Technology), Alexey I. Boyko (Skolkovo Institute of Science and Technology), Mikhail S. Litsarev (Skolkovo Institute of Science and Technology), and Ivan V. Oseledets (Skolkovo Institute of Science and Technology)

Trust Model .151
Alexander I. Kolybelnikov (Moscow Institute of Physics and Technology (State University))

Multiple-Precision Summation on Hybrid CPU-GPU Platforms Using RNS-based Floating-Point Representation .153
Konstantin Isupov (Vyatka State University) and Alexander Kuvaev (Vyatka State University)

Features of Method of Special-Purpose Calculating Unit Functioning for Linear System Solution Based on the Second Order Delta-Transformation .158
Liubov V. Pirskaya (Institute of Computer Technology and Information Security Southern Federal University)

Short Length LDPC Code-Candidate for Satellite Control Channel .163
Luiza R. Medova (Russian Academy of Science), Pavel S. Rybin (Russian Academy of Science), and Ivan V. Filatov (Moscow Institute of Physics and Technology)

Pareto Optimization of Data Transmission in a Partially Observed Communication Network .167
Nikolay A. Kuznetsov (Moscow Institute of Physics and Technology (State University)), Dmitry V. Myasnikov (Moscow Institute of Physics and Technology (State University)), and Konstantin V. Semenikhin (Moscow Institute of Physics and Technology (State University))

Analytical Verification of Computational Programs .172
Sergey A. Petrenko (Innopolis University) and Dmitry D. Stupin (Moscow Institute of Physics and Technology (State University))

Artificial Intelligence Systems

A Method to Detect Human Psycho-Emotical Disorder Based on the Empirical Mode Decomposition and Formant Analysis of Speech Signals .179
Alan K. Alimuradov (Penza State University), Pyotr P. Churakov (Penza State University), Alexander Yu. Tychkov (Penza State University), and Inna A. Elfimova (Medical Sanitary Unit of the Ministry of Internal Affairs)

Determination of Psychogenic Markers in Speech Signals Using the HHT Theory .184
Alexander Yu. Tychkov (Penza State University), Alan K. Alimuradov (Penza State University), Alexey V. Ageykin (Penza State University), and Anatoliy V. Svetlov (Penza State University)

Single-trial ERP Feature Extraction and Classification for Visual Object Recognition Task .188
Anatoly S. Bobe (Moscow Institute of Physics and Technology), Andrey S. Alekseev (Moscow Institute of Physics and Technology), Maria V. Komarova (Moscow Institute of Physics and Technology), and Dmitry Fastovets (Moscow Institute of Physics and Technology)

Effective Detection of Real Trajectories of Highly Maneuverable UAVs Under Strong Noise Conditions .193
Ivan Kalinov (Skolkovo Institute of Science and Technology) and Ruslan Agishev (Skolkovo Institute of Science and Technology)

Researcing the Fault Tolerance of Robotic System Designed via Use of Neural Network Decision Making Component of Image Processing .197
Mikhail Makarov (Vladimir State University) and Anton Kuryshov (Vladimir State University)

Algorithm for Constructing Lyapunov Functions for Assessing the Stability of UAV's Motion by the Method of Statistical Synthesis 201
Nguyen Quang Thuong (Moscow Institute of Physics and Technology (State University))

Determining the Fault Tolerance of MemristorsBased Neural Network Using Simulation and Design of Experiments 205
S.N. Danilin (Vladimir State University), S.A. Shchanikov (Vladimir State University), A.E. Sakulin (Vladimir State University), and I.A. Bordanov (Vladimir State University)

A New Incremental Semi-Supervised Graph Based Clustering 210
Vu Viet Thang (Moscow Institute of Physics and Technology) and Fedor F. Pashchenko (Moscow Institute of Physics and Technology)

Author Index 215