PIERE

Problems of Informatics, Electronics and Radio Engineering

1st INTERNATIONAL CONFERENCE PROBLEMS OF INFORMATICS, ELECTRONICS, AND RADIO ENGINEERING PIERE – 2020

PROGRAM
(GMT+7)

Novosibirsk, Russia
10 – 11 December, 2020

ORGANIZERS
Novosibirsk State Technical University
Siberian State University of Telecommunications and Information Sciences

PARTNERS
Russia (Sib) Sec, Student Branch at Novosibirsk State Technical University
Novosibirsk State Technical University - NSTU
Siberian State University of Telecommunications and Information Sciences – SibSUTIS
Institute of Electrical and Electronics Engineers – IEEE.

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Maxim A. Stepanov, Dr. Sc., Associate Prof. of the Department of Radio Receivers and Radio Transmitters, NSTU, Novosibirsk, Russia.

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Vladimir P. Razinkin, Dr.Sc., Prof., Department of Theoretical Fundame ntals of Radio Engineering, NSTU, Novosibirsk, Russia;
Boris I. Ivanov, Ph.D, Associate Prof., Department of Construction and Technology of Radio Electronic Devices, NSTU, Novosibirsk, Russia;

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Oleg V. Grishin, Dr.Sc., Prof. of the Department of Electronic Devices, NSTU, Novosibirsk, Russia;
Yury V. Morozov, Ph.D, Associate Prof., Department of Theoretical Fundamentals of Radio Engineering, NSTU, Novosibirsk, Russia;
Anna S. Kazmina, Assistant of the Department of Electronic Devices, NSTU, Novosibirsk, Russia;
Vadim A. Zhmud, Dr.Sc., Associate Prof., Head of the Department of Automation NSTU, Novosibirsk, Russia;
Galina V. Sablina, Ph.D, Associate Prof. of the Department of Automation, NSTU, Novosibirsk, Russia.

Secretaries of the Conference:
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Ekaterina A. Kravchenko, Team Leader of the Innovation and Technology Center
Angela V. Gadyukina, Engineer of the Students' Research Department, NSTU, Novosibirsk, Russia;

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WORKING LANGUAGES
English, Russian

December 10, 2020	
14:00 – 16:00	**Plenary Session**
16:30	**Section 2. Antennas and radio frequency devices** Chair: Dr.Sc., Prof., Vladimir P. Razinkin
16:30	**Section 3. Electrical engineering and circuitry** Chair: Dr.Sc., associate prof., Sergey V. Brovanov
16:30	**Section 4. Electron devices in industry, medicine, metrology** Chair: Dr.Sc., prof. Oleg V. Grishin
December 11, 2020	
12:00	**Section 5. Control engineering and information systems** Chair: Dr.Sc., associate prof., Vadim A. Zhmud
14:00	**Section 1. Digital signal processing and radio system modelling** Chair: Dr. Sc., associate prof. , Maxim A. Stepanov

Plenary Session
December 10, 2020

14:00 – 14:10   **OPENING**
Vostretsov Alexey G., Co-Chairmen
Brovanov Sergey V., Program and Organizing Committee

14:10 – 14:50   Industry 4.0 – Challenges and Chances
Hardt Wolfram, Prof. Dr. Dr. h. c., Head of Computer Engineering Professorship, Director of Computer Center of Chemnitz University of Technology, Chemnitz, Germany

14:50 – 15:30   Mathematical and Algorithmic Aspects of Unconditionally Secure Ciphers
Fionov Andrey N., Dr.Sc., Prof., Head of the Department of Applied Mathematics and Cybernetics, Siberian State University of Telecommunications and Information Sciences, Russia

15:30 – 16:10   A Novel Hybrid MLPE Technology for Residential and Small Commercial Photovoltaic Applications
Vinnikov Dmitri, Research Professor, Head of Power Electronics Group, Dept. of Electrical Power Engineering and Mechatronics Tallinn University of Technology, Estonia

Section 2. Antennas and radio frequency devices

16:30 December 10, 2020

OPENING
Chair: Dr.Sc., Prof., **Vladimir P. Razinkin**, NSTU, Novosibirsk, Russia

1. UHF load based on reflection less filter,
   Karatovsky A.Yu., NSTU, Novosibirsk, Russia
2. Modeling Quadrature and Inphase-Antiphase UHF Power Dividers,
   Vershenya I.V., NSTU, Novosibirsk, Russia
3. Study of Influence of Absorbing Material on Parameters of Line with Losses,
   Yuzvik D.A., NSTU, Novosibirsk, Russia
4. GNSS Spacecraft Antenna Radiation Pattern Parameters Evaluation Based on the Observation Results from Several Ground Points,
   Zavgorodniy A.S., FSUE "VNIIFTRI", Mendeleevo, Moscow region, Russia
5. An Analysis of Microwave Radiators in Order to Diminish the Array Scan Blindness,
   Alexeytsev S.A., NSTU, Novosibirsk, Russia
6. Wideband phase shifters at 22.5, 45 and 67.5 degrees,
   Parshin Yu.N., NSTU, Novosibirsk, Russia
7. The Novel Waveguide-Fed Crossed Dipole Antenna,
   Bondareva A.V., NSTU, Novosibirsk, Russia
8. The Dual-band Dipole-like Arrangement for Digital Printed Antenna Arrays,
   Alexeytsev S.A., NSTU, Novosibirsk, Russia
9. Printed Dipole Antenna with Stepped-Width Dipoles,
   Tarasenko N.V., NSTU, Novosibirsk, Russia
10. Printed Ultra Wideband Dipole Antenna,
    Razumihin A.S., NSTU, Novosibirsk, Russia

Section 3. Electrical engineering and circuitry
16:30 December 10, 2020

OPENING

Chair: Dr.Sc., associate prof., **Sergey V. Brovanov** NSTU, Novosibirsk, Russia

1. Research on Different Current Components Compensation Techniques in Nonsinusoidal Voltage Conditions,
Dybko M.A., NSTU, Novosibirsk, Russia
2. Soft-starter for high-Voltage IM based on a multi-zone AC voltage regulator with improved EMC,
Kosykh Ye.A., NSTU, Novosibirsk, Russia
3. Analysis of electromagnetic processes in autonomous power supply system,
Korobkov D.V., NSTU, Novosibirsk, Russia
4. Resonant inverting boost DC-DC converter with switch-based capacitors,
Nurlatov N.V., NSTU, Novosibirsk, Russia

BREAK

5. Analysis of Tasks of Forming Thermal Imaging of Electrical Devices,
Punt E.A., Moscow State Technical University of Civil Aviation, Moscow, Russia
6. Modified Algorithm for Maximum Power Point Tracking in Photovoltaic Systems,
Rod'kin N.S., Department of Electromechanics, Electrical and Electronic Apparatuses Moscow Power Engineering Institute Moscow, Russia
7. Zero Sequence Astatic Control of Three Phase Four-Leg Voltage Inverter of Power Supply System,
Khristolyubova A.I., NSTU, Novosibirsk, Russia
8. Resonant LLC Low Voltage Converter,
Shemolin I.S., Tomsk State University of Control Systems and Radioelectronics, Tomsk, Russia

Section 4. Electron devices in industry, medicine, metrology

16:30 December 10, 2020

OPENING

Chair: Chair: Dr.Sc., prof. **Oleg V. Grishin** NSTU, Novosibirsk, Russia

1. Gas Analyzer for Measuring Oxygen Partial Pressure in Breathing Mixtures,
   Lipnin Yu.A., FSUE «VNIIFTRI», Mendeleevo, Moscow region, Russia
2. Automatization of Processes of Testing and Calibration of Electric Meter,
   Tretyak V.V., NSTU, Novosibirsk, Russia
3. Experimental and theoretical study of the effect of temperature on the piezo-optical transducer for strain gauges,
   Zagubisalo P.S., NSTU, Novosibirsk, Russia
4. Information Security Monitoring in Optical Access Networks,
   Bogachkov I.V., Omsk State Technical University, Omsk, Russia
5. Research of the Error of the RMS Measurement Method Based On Low-Pass Filtration,
   Serov A.N., National Research University "Moscow Power Engineering Institute", Moscow, Russia

| BREAK |

6. Calibration of the Vector Magnetometer Based on Solution of the System of Linear Equations,
   Morozov Yu.V., NSTU, Novosibirsk, Russia
7. Application of Image Interpolation Algorithms in Thermal Surveillance Devices,
   Golitsyn A.A., NSTU, Novosibirsk, Russia
8. Calibration of GNSS Receiver with GLONASS Signals,
   Karaush E.A., FSUE "VNIIFTRI», Mendeleevo, Moscow Region, Russia
9. Assessing the Influence of Ephemeris-Time Information Accuracy on Code Based Positioning,
   Zhilinskiy V.O., FSUE "VNIIFTRI", Moscow region, Mendeleevo, Russia
10. GNSS-receivers carrier phase calibration,
    Burtsev S.Y., FSUE «VNIIFTRI», Mendeleevo, Moscow region, Russia

Section 5. Control engineering and information systems
12:00 December 11, 2020

OPENING
Chair: Dr.Sc., associate prof., **Vadim A. Zhmud** NSTU, Novosibirsk, Russia

1. Distortion Compensation in Structured Lighting Systems,
   Il'inykh S.P., NSTU, Novosibirsk, Russia
2. Geoinformation Technology for Estimation of Geoecological Risks from Technogenic Noise,
   Kopylova O.A., NSTU, Novosibirsk, Russia
3. Application of Hybrid Mathematical Analog-digital Devices in Intelligent Microelectronic and Microprocessor Systems,
   Mikhaylov V.V., South-Russian State Polytechnic University of M.I. Platov name, Novocherkassk, Russia
4. A Combined Location Method with Indoor Signal Strength Measurement,
   Doshchinsky I.V., Siberian State University of Telecommunications and Information Sciences, Novosibirsk, Russia
5. Development of a control board for walking mechatronic systems: principle of operation and implementation,
   Myakhor D.A., NSTU, Novosibirsk, Russia
6. Experience of Using Neural Network Neocognitron in Solving the Inverse Problem of Geophysics,
   Yakimenko A.A., NSTU, Novosibirsk, Russia
7. Simulink-based Quadcopter Control System Model,
   Filippov I.F., Sevastopol State University, Sevastopol, Russia
8. Hybrid Intelligent Mobile Robot Control System,
   Gavrilov A.V., NSTU, Novosibirsk, Russia

BREAK

9. Synthesis of an adaptive sliding controller for a stabilized object on the ship,
   Buy Tam Van, NSTU, Novosibirsk, Russia
10. Comparison of the action of Objective Functions in the design of Two-Channel Systems by the Method of Numerical Optimization,
    Zhmud V.A., NSTU, Novosibirsk, Russia
11. Design of a Two-Channel Control System with Second-Order Astatism,
    Zhmud V.A., NSTU, Novosibirsk, Russia
12. Classification of brain activity patterns using machine learning based on EEG data,
    Murtazina M.S., NSTU, Novosibirsk, Russia
13. Stand for experimental evaluation of the quality of facial recognition algorithms,
    Yakimenko A.A., NSTU, Novosibirsk, Russia
14. Computer Vision Controlling an Autonomous Unmanned Aerial Vehicle Flight over a Railway,

Lebedev A.O., NSTU, Novosibirsk, Russia

15. Development of a Software Module for the Automation of Human-Machine Systems Design,
Grif M.G., NSTU, Novosibirsk, Russia
16. Development of a Library for Solving Scalar and Vector Optimization Problems with Stochastic Methods,
Grif M.G., NSTU, Novosibirsk, Russia
17. Intelligent Microprocessor System Control and Registration of Data for Energy Audit,
Mikhaylov V.V., South-Russian state Polytechnic University of M.I. Platov name, Novocherkassk, Russia
18. On Reliability of Fiber-Optic Link of PON under Periodic Control and Pre-failure Detections,
Kvitkova I.G., NSTU, Novosibirsk, Russia
19. Parallelization applied to the synthesis methodology and operation of complex systems based on the analysis and modelling of their physical and chemical processes,
Altoukhov A.V., Lomonosov Moscow state university, Moscow, Russia

Section 1. Digital signal processing and radio system modelling
14:00 December 11, 2020

OPENING

Chair: Dr. Sc., associate prof., **Maxim A. Stepanov** NSTU, Novosibirsk, Russia

1. Adaptive Primary Speech Signals Codecs for Software-Configured Radio Systems,
   Kirillov S.N., Ryazan State Radio Engineering University (RSREU), Ryazan, Russia
2. The Amplitude of Output Signal Estimation in The Study of Quantum Superconducting Structures,
   Koltakova A.E., NSTU, Novosibirsk, Russia
3. Procedure for Multi-Criteria Synthesis of OFDM Signals to Increase the Structural Hiding of Radio Communication Systems,
   Lisnichuk A.A., Ryazan State Radio Engineering University (RSREU), Ryazan, Russia
4. Simulation of Objects for a Three-position Radar System,
   Sabitov T.I., NSTU, Novosibirsk, Russia
5. Processing Spatiotemporal Signals Recorded Linear Array,
   Zima D.N., NSTU, Novosibirsk, Russia
6. Computational Efficiency of Interpolated Band-Stop Filters,
   Skulina E.G., NSTU, Novosibirsk, Russia
7. The Algorithm of the Two-dimensional Partially Coherent Model Synthesis of the Moisture Target Based on Its Multipoint Geometrical Starting Model,
   Podkopayev A.O., NSTU, Novosibirsk, Russia
8. Crosstalk due to Nonlinearity of the OFDM Path,
   Shushnov M.S., Siberian State University of Telecommunications and Information Sciences, Novosibirsk, Russia
9. Evaluation of Beamforming Techniques for Speaker Identification,
   Schmidt Rene´, Technische Universitat Chemnitz, Cehmnitz, Germany
10. Analysis of Instrumental Errors Influence on the Vector Magnetometer Calibration,
    Morozov Y.V., NSTU, Novosibirsk, Russia
11. Development of A Noise Generation Device with Polarization Control,
    Nabilkin V.S., Institute of Radio Engineering, P.G. Demidov Yaroslavl State University, Yaroslavl, Russia
12. Using Wavelet Analysis for Laser Second Mode Detection,
    Mironenko A.A., NSTU, Novosibirsk, Russia

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Zoom Meeting Room becomes available 30 minutes before the meeting starts.

Date	Time (GMT+7)	Meeting Title	Join Meetings via Zoom
December 8	17:30	Test conference	**Personal Link Name:** https://zoom.us/j/98434988203?pwd=SHRta2Nvc1liTzJFZnRMazNGRGZFUT09 **Meeting ID:** 984 3498 8203 **Meeting password:** 656754
December 10	14:00 – 16:00	Plenary Session	**Personal Link Name:** https://zoom.us/j/98434988203?pwd=SHRta2Nvc1liTzJFZnRMazNGRGZFUT09 **Meeting ID:** 984 3498 8203 **Meeting password:** 656754
	16:30	Section 2. Antennas and radio frequency devices	**Personal Link Name:** https://zoom.us/j/97721854015?pwd=S1FjV2FFTndCWklzaEhYYjZ0dVlVZz09 **Meeting ID:** 977 2185 4015 **Meeting password:** 396787
	16:30	Section 3. Electrical engineering and circuitry	**Personal Link Name:** https://zoom.us/j/98434988203?pwd=SHRta2Nvc1liTzJFZnRMazNGRGZFUT09 **Meeting ID:** 984 3498 8203 **Meeting password:** 656754
	16:30	Section 4. Electron devices in industry, medicine, metrology	**Personal Link Name:** https://us02web.zoom.us/j/85466766929?pwd=eGhTNXhrYzNaNnZQL0JSeXU1dG9PZz09 **Meeting ID:** 854 6676 6929 **Meeting password:** 020222
December 11	12:00	Section 5. Control engineering and information systems	**Personal Link Name:** https://zoom.us/j/94194944928?pwd=d2V1WDlmb1JQdGxQaTMyWUxzMU1NZz09 **Meeting ID:** 941 9494 4928 **Meeting password:** 930440
	14:00	Section 1. Digital signal processing and radio system modelling	**Personal Link Name:** https://zoom.us/j/97449702914?pwd=RWh3ZDJzQ2NuLys2d2d2NEozQWx3QT09 **Meeting ID:** 974 4970 2914 **Meeting password:** 091246

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