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2025 IEEE 26<sup>TH</sup>  
INTERNATIONAL  
CONFERENCE  
OF YOUNG  
PROFESSIONALS  
IN ELECTRON  
DEVICES AND  
MATERIALS



# SCIENCE PROGRAM



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- online report

Time zone - UTC+7 NOV.T



# Plenary Session

June 28th, 9:30-13:00, Hall S

**1. Conference Opening Ceremony – 9:30**

Vadim Vasiliev

Ministry of Science and Innovation  
Policy of the Novosibirsk Region

Anatoly Bataev  
Novosibirsk State  
Technical University

**2. Application of Cross-Regulation Technologies to Improve the Efficiency of Distribution Networks with Unbalanced Loads – 10:00**

Dmitry Panfilov

JCS "Rosseti R&D Center "

**3. Energy-Efficient VLSI Components for Neuromorphic Artificial Intelligence Systems – 10:30**

Vladimir Popov

Rzhanov Institute  
of Semiconductor Physics

**4. Artificial Intelligence: Neural Networks or Physical Process Modeling. Unity and Contradictions - 11:00**

Sergey Khalyutin

Moscow State Technical University  
of Civil Aviation

**5. OTA testing of satellite radio communication, radar, and radio navigation equipment - 11:30**

Ivan Rezaev

TESART, SPEGroup



**6. Network Protocol Design and Automated Deployment of  
Reliable Networks for Autonomous Systems - 11:45**

Valentin Olenov

St. Petersburg State University of  
Aerospace Instrumentation

**7. Status of the SKIF 4+ Generation Synchrotron Radiation  
Source - 12:15**

Yan Zubavichus

Core Research Facility 'SKIF'

**8. Signing of a Cooperation Agreement between NSTU NETI  
and AO Ekran FEP - 12:50**

Anatoly Bataev  
Novosibirsk State  
Technical University

Dmitrii Kulikov  
AO Ekran FEP

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# Section: Semiconductor Physics and Technology

June 29th, 14:00-19:00, Hall B

Section Chairs: Nataliya Shwartz, Dmitriy Ostertak, Alexey Gayduk

INVITED TALK:

**Structures for New-generation Infrared Optoelectronic  
Devices Based on A III As x Sb 1-x Solid Solutions:  
Problems and Solutions**

Evgeny Yemelyanov  
ISP SB RAS

**1. Memristors in an Integrated Circuit**

Dmitry Serov  
National Research Lobachevsky  
State University of Nizhni Novgorod  
*Dmitry Serov, Artem Sushkov, Denis Taran, Grigory Zharkov, Vitaly Lukoyanov,  
Alexey Mikhaylov*

**2. Experimental Estimation of Intercorrelation Between  
Radiation Effects and Semiconductor Detectors Measuring  
Characteristics Used for Static Radiation Detection of  
Nuclear Reactors**

Ivan Butin  
The Federal State Unitary Enterprise  
Dukhov Automatics Research  
Institute (VNIIA)  
*Yuriy N. Barmakov, Valentin I. Butin, Ivan V. Butin*



**3. The Computational-experimental Technique for Latchup Level Prediction in CMOS ICs Based on the Enlarged Parameters of the Diffuse and Drift Model**

Anastasia Butina

Dukhov Research Institute of  
Automatics (VNIIA)

*Yuriy N. Barmakov, Alexey V. Butin, Anastasia V. Butina*

**4. Thermal Stability of Schottky Diodes with Pt/n-GaAs Contacts Fabricated by Electrochemical Deposition of Platinum**

Mariya Vaisbekker

Tomsk State University of Control  
Systems and Radioelectronics

*Mariya S. Vaisbekker, Tatiana P. Bekezina, Victoria A. Burmistrova,  
Alena A. Talovskaia, Ivan V. Kulinich, Evgenij S. Barbin*

**5. Mechanism of Gradual Reset in Resistive Switching of Metal Oxide Based RRAM**

Aleksandr Vankaev

Institute of Microelectronics  
Technology and High Purity  
Materials RAS



*Aleksandr Vankaev, Ekaterina Klyukina, Mikhail Fedotov, Sergei Koveshnikov*

**6. Resistive Switching and Synaptic Properties of Ni/SiOxNy /Si Devices**

Karina Ermak

Novosibirsk State Technical  
University



*Karina Ermak, Gennadiy Kamaev, Vladimir Volodin*



**7. Epitaxial Growth of AlN Nanowires on Two- Dimensional h-BN Flakes Transferred onto SiO<sub>2</sub>/Si Substrate**

Albert Dautov

Saint Petersburg State University

*Albert Dautov, Talgat Shugabaev, Alexey Kuznetsov, Konstantin Kotlyar,  
Davit Ghazaryan, Adilet Toksumakov, Alexey Bolshakov, Alesya V. Parfeneva,  
George Cirlin, Vladislav Gridchin*

**8. Structural Transformation of Bi<sub>2</sub>Se<sub>3</sub>(0001) Surface during Sn Monolayer Annealing**

Konstantin Zakhozhev

Rzhanov Institute of Semiconductor  
Physics SB RAS

*Konstantin Zakhozhev, Sergei Ponomarev, Vladimir Golyashov, Dmitry Nasimov,  
Konstantin Kokh, Dmitry Rogilo*

**9. Optimization of Deposition Parameters for Thin-Film Semiconductor Structures via Spray Pyrolysis**

Timur Zinchenko

Penza State University

*Timur Zinchenko, Ekaterina Pecherskaya, Sergey Gurin , Maxim Novichkov,  
Vladimir Alexandrov, Gennadiy Kozlov*

**10. Microelectronic Technologies for Elements of Silicon Refractive X-ray Optics**



Vitaly Kuzmenko

NRC "Kurchatov Institute" – Valiev  
IPT

*Vitaly Kuzmenko, Andrey Miakonkikh, Dmitry Zverev, Anatoly Snigirev,  
Konstantin Rudenko*

**11. Modeling of an Optimized Self-Aligned Selector Device for High-Density RRAM Arrays**



Mikhail Fedotov

Institute of Microelectronics  
Technology RAS

*Mikhail Fedotov, Viktor Korotitsky, Sergei Koveshnikov*





**12. Technology for Reducing HEMT T-Gate Length via Formation of Silicon Nitride-Based Sidewall Dielectric Spacers for Mass Production of GaN MMICs**



Alexandr Shesterikov

Tomsk State University of Control  
Systems and Radioelectronics

*Alexandr E. Shesterikov, Darya A. Shesterikova, Artyom I. Kazimirov,  
Evgeniy V. Erofeev*

**13. Kinetic study of Ge nanocluster formation in composite GeOx[SiO<sub>2</sub>] films**

Nikita Kislukhin

Rzhanov Institute of Semiconductor  
Physics Siberian Branch of Russian  
Academy of Sciences

*Nikita A. Kislukhin, Kseniya N. Astankova, Vladimir A. Volodin*

**14. Buried Power Rail Technology to Reduce Logic Gate Layout Designed on 7nm Open-Source PDK**

Ivan Pavlov

Scientific Research Laboratory «  
Advanced VLSI CAD Systems»,  
MIET

*Ivan Pavlov, Daria Ryzhova*

**15. Energy-Efficient VLSI Ferroelectric Elements for Neuromorphic Artificial Intelligence Systems**

Valentin Antonov

Rzhanov Institute of Semiconductor  
Physics Siberian Branch of Russian  
Academy of Sciences

*Vladimir Popov, Mikhail Tarkov, Valentin Antonov, Fedor Tikhonenko,  
Andrey Miakonkikh, Konstantin Rudenko*



# Section: Antennas and Microwave Devices

June 29th, 9:00-13:00, Hall B

Section Chair: Maksim Stepanov

## 1. Ku-Band Antenna Array Concept with Stable Radiation Pattern Form and High-Level Harmonic Interference Filtering

Mikhail Shishkin

Moscow Technical University of  
Communication and Informatics  
(MTUCI)

*Mikhail Shishkin*

## 2. U-Slotted Isolated Cavity-Backed Ku-Band MSA with the Analysis of Bandwidth Enhancement Methods

Mikhail Shishkin

Moscow Technical University of  
Communication and Informatics  
(MTUCI)

*Mikhail Shishkin*

## 3. Decomposition Algorithm for Radiation Characteristics Analysis of the «Antenna Array-Dielectric Radome» System



Yelizaveta Zima

Tomsk State University of Control  
Systems and Radioelectronics

*Yelizaveta Zima, Vladimir Toropov, Aleksey Kvasnikov*

## 4. Emission of An S-band Microwave Pulse from a Corrugated Gyromagnetic Line Using a Waveguide Dielectric Antenna



Vladimir Konev

Institute of High Current Electronics

*Vladimir Konev, Roman Sobyenin, Alexey Klimov, Ilya Romanchenko,  
Pavel Priputnev*



## **5. Finite-Element Based Eigenmode Analysis Algorithm for Standard Transmission Lines**



Vladimir Toropov

Tomsk State University of Control  
Systems and Radioelectronics

*Vladimir Toropov, Aleksey Kvasnikov*

## **6. Algorithm for Hexahedral Mesh Generation with Pre-Thining of 3D Object Points**



Nikita Shaimanov

Tomsk State University of Control  
Systems and Radioelectronics

*Nikita Shaimanov, Anton Ivanov, Aleksey Kvasnikov*

## **7. Temperature Analysis of Quadrature Demodulator**

Aleksey Bakulin

FSUE "VNIIFTRI"

*Aleksey Bakulin, Aleksey Zavgorodnij*

## **8. Estimation of the Coordinates of an Unmanned Aircraft in the Tasks of Determining the Radiation Pattern of a Satellite Antenna**

Demyan Filippov

FSUE «VNIIFTRI»

*Alexej Zavrorodnij, Vladimir Voronov, Vadim Lesnichenko, Dem`yan Filippov*

## **9. Expected Applications of Additive Technologies in the Production of Units with Radio Transparency Requirements**

Vitaly Chuklin

Omsk Scientific-Research Institute of  
Instrument Engineering

*Vitaliy Chuklin, Konstantin Talipov*



**10. Dual Band CSRR Metamaterial High Sensitive Microwave Sensor for Dielectric Detection**



Mahdi Ghafourivayghan

Ural Federal University

*Mahdi Ghafourivayghan, Sergey Shabunin*

**11. GreenTensor Library: Tool for Calculate Scattering Diagrams and Bistatic RCS in Multilayered Spherical Structures**



Dmitriy Denisov

Ural Federal University named after the first  
President of Russia B.N. Yeltsin

*Dmitriy Denisov, Marat Gizatullin, Vitaliy Fadeev, Ilya Skumatenko,  
Mikhail Shesterov, Roman Grishin*

**12. Synthesis of Metamaterials from Graphene-Like Films on Silicon Carbide**



Viktor Klimin

Southern Federal University

*Viktor Klimin, Ivan Bobkov, Igor Lysenko, Grigoryev Mikhail, Pavel Tarasov,  
Alexander Demyanenko*

**13. Tapered Slot Antenna Formed on SiC Surface by Plasma Processing**



Viktor Klimin

Southern Federal University

*Viktor Klimin, Igor Lysenko, Alexander Demyanenko, Ivan Bobkov*



# Section: Signal and Information Processing in Systems of Various Purposes in the Presence of Interference

June 28th, 14:30-19:00, Hall B

Section Chair: Alexey Vostretsov

1. **Digital Low-Latency High-Frequency Electrical Breakdown Detector and Its Hardware Implementation**

Aleksandr Vybornov

Joint Institute for Nuclear Research

*Aleksandr Sergeevich Vybornov*

2. **Investigation of the Effect of Simulation Signal Parameters on the Operation of Consumer Navigation Equipment in an Anechoic Shielded Chamber**

Hristofor Grill

FSUE «VNIIFTRI»

*Hristofor Grill, Svyatoslav Burtsev, Dmitry Pecheritsa*

3. **Classification of Outdoor Sports using Symbolic Fourier Transform of Multivariate Time Series**



Jarno Matarmaa

Ural Federal University

*Jarno Matarmaa, Wisam Mustafa, Anton Dolganov*



**4. The Effect of the Current-Voltage Characteristic of the Cell Elements of the Memristor-Selector Crossbar Array on the Output Signal Shape**



Alexander Neustroev

University of Tyumen

*Alexander Neustroev, Sergey Udovichenko*

**5. Application of Channel Emulator for Testing LOW-ORBIT Satellite Communication System**

Evgenii Morozov

Tomsk State University of Control  
Systems and Radioelectronics

*Evgeny D. Morozov, Konstantin N. Roschin, Mihail E. Ilyasov*

**6. Adaptive Interference Canceller in Sodar on Antenna Array**

Ivan Rybakov

Institute of Monitoring of Climatic and  
Ecological Systems (IMCES) SB  
RAS, Tomsk State University of  
Control Systems and  
Radioelectronics (TUSUR University)

*Rybakov Ivan, Krasnenko Nikolay*

**7. Joint Global Navigation Satellite System Signal Optimal Processing of the Different Frequency Bands**



Stepan Orobchenko

National Research University "MPEI"

*Nikita Petukhov, Petr Kuznetsov, Elena Silaeva, Roman Kulikov, Artyom Evseev,  
Stepan Orobchenko*

**8. Development and Performance Analysis of Algorithm for Joint Processing of Measurements from UWB ToF/AoA LPS and PDR Algorithm Estimates for Known User Height**



Nikita Petukhov

Moscow Power Engineering Institute

*Nikita Petukhov, Artyom Evseev, Kirill Kochka, Alexander Malyshev,  
Artur Yusupov, Vladimir Zamolodchikov*



**9. Application of UWB technology for communication with UAVs**

Nikita Fillippov

Siberian State University of  
Telecommunications and Information  
Systems

*Nikita Filippov, Svetlana Vorobeva, Roman Vorobev*

**10. Adaptation of Polar Codes to Enhance BER Performance in Next-Generation Communication Systems**

Georgiy Shalin

Tomsk State University of Control  
Systems and Radioelectronics

*Georgiy Shalin, Dmitry Pokamestov, Yakov Kryukov, Artyom Shinkevich,  
Sergey Ereemeev, Dmitry Ilinskiy*

**11. Method for Recognizing Small Obstacles in Assistant Devices for the Blind**



Viktor Smirnov

Novosibirsk State Technical  
University

*Andrey Nikulin, Viktor Smirnov, Anna Kazmina*

**12. Test Bench for Static, Dynamic and Thermal Cycling Tests of Power Semiconductor Transistors at Cryogenic Temperatures**



Mikhail Ostapchuk

Moscow Aviation Institute (National  
Research University)

*Mikhail Ostapchuk, Vladislav Zhukov, Dmitry Shishov*

**13. Multi-Channel Analog-to-Digital Integrated Circuit for Physical Experiments**

Salavat Yamaliev

National Research Nuclear  
University MEPhI

*Salavat Yamaliev, Danila Lobankov, Eduard Atkin, Dmitry Normanov,  
Vladimir Yurovsky, Vladimir Butuzov*



## 14. Fast Ion Extraction Control System for ESIS

Maxim Dzugaev

Joint Institute for Nuclear Research

*Maxim Dzugaev, Dmitry Ponkin, Elizaveta Butenko, Nikolay Malyshev,  
Dmitry Rassadov, Evgeny Matyuhkanov*

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# Section: Telecommunications

June 28th, 15:00-18:00, Hall A

Section Chair: Svetlana Vorobiova

## 1. **Optimized Network Slicing Algorithm for heterogeneous 5G wireless Access Node in Advanced Surveillance System**

Ehsan Wadood

Moscow Institute of Physics and  
Technology

*Umer Mukhtar Andrabi, Ehsan Wadood, Sameed Ahmed Khan, Raman Saurabh,  
A S M Humayun Kabir*

## 2. **Detailed Description of Correlation Method for Longitudinal Power Profile Estimation**

Maria Gorbashova

Moscow Institute of Physics and  
Technology: MIPT, T8 Company

*Maria Gorbashova, Aleksandr Tarasov, Timur Bazarov, Leonid Samodelkin,  
Oleg Naniy, Vladimir Treschikov*

## 3. **Influence of Phase States of Binary Unit Cell on RIS Characteristics**

Sergey Ereemeev

Tomsk State University of Control  
Systems and Radioelectronics

*Sergey Ereemeev, Dmitriy Ilinskiy, Yakov Kryukov, Dmitriy Pokamestov,  
Eugeny Rogozhnikov, Ivan Rybakov*

## 4. **Optical Cable Redundancy Efficiency for a Long-Reach Passive Optical Access Network Taking Into Account Common Cause Failures**



Irina Kvitkova

Siberian State University of  
Telecommunications and Information  
Science

*Viatcheslav Shuvalov, Irina Kvitkova*



**5. Network Traffic Augmentation Algorithm in the Problem of Network Attacks Detection in Mixed Networks**



Nikita Kolesnikov

ITMO University

*Kolesnikov Nikita, Popov Ilya*

**6. Applicability of GNSS Pseudorange Residual Error Mitigation Model to Different Types of Receivers**

Vladislav Zhilinskiy

Russian Metrological Institute of  
Technical Physics and Radio  
Engineering

*Vladislav Zhilinskiy*

**7. Analysis and Design of Common Channel Precoding Algorithms for RSMA**

Artyom Shinkevich

Tomsk State University of Control  
Systems and Radioelectronics

*Artyom Shinkevich, Dmitry Pokamestov, Yakov Kryukov, Georgiy Shalin,  
Eugeni Rogozhnikov*

**8. Elements Redundancy in Reorderings of Switching- Based Calibration for DACs**

Natalya Kvashina

Peter the Great St.Petersburg  
Polytechnic University

*Natalya Kvashina, Mikhail Yenuchenko*

**9. The Second-Order Discrete-Analog Filter on Three Switched Capacitors and Tuning of Pole Frequency by Multiplying Digital-to-Analog Converter**



Kuznetsov Dmitry

Don State Technical University

*Darya Denisenko, Dmitry Kuznetsov, Yuri Ivanov, Nikolay Butyrlagin*



**10. Adaptive Pruning in Compressed Sensing Channel Estimation for OFDM System Enabled by a Novel Loss Function**



Semen Mukhamadiev

Tomsk State University of Control  
Systems and Radioelectronics

*Semen Mukhamadiev, Eugeniy Rogozhnikov, Edgar Dmitriyev,  
Hashem Khaled Rehab*

**11. Development of a Linux Kernel Driver for the SBNI Network Interface Using Remote Real-Time Processing Units**



Ilya Rebus

Novosibirsk State Technical  
University

*Ilya Rebus, Galina Frantsuzova, Alexey Kolker*

**12. On the use of modern IoT and AI technologies in the «Smart Forest» system**

Ivan Frolov

Gorno-Altai State University

*Nikolay G. Kudryavtsev, Varvara Y. Safonova, Ivan N. Frolov, Dmitry V. Kudin*

**13. Modeling and Prototyping of Unit Cell for Reconfigurable Intelligent Surface: Electromagnetic Model, Design and Circuitry**

Dmitriy Ilinskiy

Tomsk State University of Control  
Systems and Radioelectronics

*Dmitriy Ilinskiy, Sergey Ereemeev, Yakov Kryukov, Dmitriy Pokamestov,  
Georgiy Shalin, Artem Shinkevich*



# Section: Generation and Application of Synchrotron Radiation

June 29th, 17:00-19:00, Hall C

Section Chairs: Alexander Berkin, Boris Goldenberg

## **1. A Precise Individual Superconductive Undulator Pole Measurement System**

Fedor Kazantsev

Budker Institute of Nuclear Physics  
Siberian Branch of Russian Academy  
of Science

*Fedor P. Kazantsev, Nikolay A. Mezentsev, Vitaly A. Shkaruba*

## **2. Development and Implementation of Application for Automation of the Synchrotron Radiation Technological Station**

Ivan Kopalkin

Budker Institute of Nuclear Physics of  
Siberian Branch Russian Academy of  
Sciences (BINP SB RAS)

*Ivan Kopalkin, Boris Goldenberg*

## **3. Automation of the Technological SR Station at the VEPP-4M Storage Ring**

Alexander Kopylov

Budker Institute of Nuclear Physics of  
SB RAS

*Alexander Kopylov, Boris Goldenberg*



**4. Structural and Phase Stability of the  $\text{Ti}_3\text{C}_2\text{T}_x$  MXene at Elevated Temperatures: in-situ X-ray Diffraction Investigation.**

Dmitriy Krotkevich

Tomsk Polytechnic University

*Dmitriy Krotkevich, Egor Kashkarov, Zining Wang, Maxim Syrtanov,  
Nahum Travitzky, Andrey Lider*

**5. Development of Methodologies for Conducting XAFS Studies on the Superconducting Undulator in the SKIF Project**

Vadim Ovsyannik

Budker Institute of Nuclear Physics  
SB RAS

*Vadim Ovsyannik, Konstantin Zolotarev*

**6. Analysis of the Parameters of Antiscatter X-ray Grids for Dental Microscopy**

Alexander Samoilov

Budker Institute of Nuclear Physics of  
SB RAS

*Alexander Samoilov, Vladimir Nazmov, Nicolay Yanushkevich*

**7. Jet Streams Upon Impact on Joints of Structural Materials**

Vyacheslav Khalemenchuk

Lavrentyeva Institute of  
Hydrodynamics of the SB RAS

*Vyacheslav Khalemenchuk, Asylkaev Artur, Ivan Rubtsov, Konstantin Ten,  
Alexander Tumanik, Alexey Kashkarov*

**8. Resistance of Neoflon Rubber to X-ray Lithography Processes**

Nicolay Janushkevich

Budker Institute of Nuclear Physics of  
SB RAS

*Nicolay Yanushkevich, Vladimir Nazmov, Evgeniy Zozulya, Alexander Samoilov*



# Section: Optoelectronic Devices and Systems: Physics, Electronics, Application

June 29th, 9:30-13:00, Hall A

Section Chairs: Eugene Sypin, Maxim Trigub

## 1. All-Optical Bessel Beam Generation in Carbon Nanotube Suspension for a Formation of Biocompatible Organic Nanomaterials

Pavel Vasilevsky

National Research University of  
Electronic Technology (MIET)

*Pavel N. Vasilevsky, Mikhail S. Savelyev, Ekaterina P. Otsupko,  
Alexander Yu. Gerasimenko*

## 2. High-Speed AWG-Based Interrogation of Fabry-Perot Based Fiber Sensors

Maxim Gaskov

Institute of Automation and  
Electrometry Siberian Branch of the  
Russian Academy of Sciences

*Maxim Gaskov, Vadim Terentyev, Victor Simonov, Ivan Lobach*

## 3. Image Resolution Enhancement Algorithm for Different Pairs of Optical Microscope Lenses



Ekaterina Andryushchenko  
Novosibirsk State Technical  
University

*Ekaterina Andryushchenko, Vladimir Guzhov*



#### 4. Automated Analysis of Interferograms with Arbitrary Phase Shifts



Fedor Skorokhodov  
Novosibirsk State Technical  
University

*Fedor Skorokhodov, Evgeniy Kazakov, Sergey Ilinykh*

#### 5. What to Note when Designing an USB Camera

Alexandr Golitsyn

Institute of Semiconductor Physics

*Natalia Seyfi, Alexandr Golitsyn, Andey Golitsyn, Sergey Chiburun*

#### 6. A 14-Bit 150 kS/s Hybrid ADC for Matrix Applications

Danila Lobankov

National Research Nuclear  
University MEPhI (Moscow  
Engineering Physics Institute)

*Danila Lobankov, Salavat Yamaliev, Eduard Atkin, Dmitry Normanov,  
Andrei Cherbov*

#### 7. Design of the Cross-Dispersion Echelle Spectrometer



Aleksei Syrbakov

Institute of Automation and  
Electrometry of the Siberian Branch  
of the RAS

*Aleksei Syrbakov, Igor Zarubin, Vladimir Labusov, Anatoly Dzyuba,  
Stanislav Dodonov*

#### 8. Advancing Object Recognition: Integrating AI with Laser-Integrated Graphene Electrodes for Enhanced Neural Signal Analysis



Neda Firoz

Tomsk State University

*Neda Firoz, Mrinal Vashisth, Amrit Hui*



**9. Development and Research of the Characteristics of the Parametric Laser on the AGS Crystal**

Alexander Makeev

Siberian State University of  
Geosystems and Technologies

*Valerik S. Ayrapetyan, Alexander V. Makeev*

**10. Numerical Calculation of Grating Couplers Based on SiN loaded LNOI**

Ayan Myrzakhmetov

Laboratory of Photonic Integrated  
Circuits, Tomsk State University of  
Control Systems and  
Radioelectronics

*Ayan Myrzakhmetov, Anton Perin, Denis Mokhovikov*

**11. Proof-of-Concept Study of Distributed Measurements of Coal Dust Concentration**

Alina Tkachenko

Institute of Automation and  
Electrometry SB RAS

*Alina Tkachenko, Victor Simonov, Ivan Lobach*





## Section: Power Electronics

June 29th, 9:00-13:00, Hall C

Section Chairs: Denis Kotin, Maksim Zharkov

### INVITED TALK:

#### **Three-phase Active Front-End converter output impedance shaping under unbalanced input voltages**

Ivan Alexandrov

Novosibirsk State Technical University

#### **1. Anti-Windup Resonant Controller with Zero Phase**



Sergey Evdokimov

National Research University of  
Electronic Technology

*Sergey Evdokimov, Timur Zhoraev, Anatoliy Shchagin*

#### **2. Analysis of Radiated Emissions from a Microstrip Line Covered by an Electromagnetic Shield**



Artem Zajkov

Tomsk State University of Control  
Systems and Radioelectronics

*Artem Zajkov, Anton Ivanov*

#### **3. Integral Nonlinearity and Area Parameters Optimization of Segmented Digital to Analog Converter**

Dmitriy Kazymov

SibIS LLC

*Dmitriy Kazymov, Anton Cherepanov*



#### **4. Double-Side Cooled 3D Package Solution for High Current GaN Half-Bridge Power Module**



Irina Kodorova

Tomsk branch of JSC «Radar mms»,  
National Research Tomsk State  
University

*Irina Kodorova, Egor Polyntsev, Aleksandr Bartenev, Andrey Aksenov,  
Valery Kagadey*

#### **5. Agrivoltaic Panel Design for Greenhouses**



Sherzod Kushakov

“TIAME” National Research  
University

*Sherzod D. Kushakov, Akram M. Mirzabaev, Mukhriddin U. Eshkulov,  
Bakhodir Kh. Mamatkulov, Adina D. Egamberganova,  
Abdulatif A. Shermukhamedov*

#### **6. The Solution for Grid-Connected Inverters in Order to Comply with Grid-Code: Integrating SHEPWM and 30° Phase-Shifted Two-Channel Inverter Topology**

Yulia Oleynik

Ural Federal University

*Yulia Oleynik, Stanislav Shelyug, Alexander Levin*

#### **7. High Frequency 1 MHz 72 W Forward Converter with Active Clamp and Synchronous Rectifier based on GaN Multichip Power Micromodules**



Egor Polyntsev

National Research Tomsk State  
University

*Egor Polyntsev, Aleksandr Bartenev, Irina Kodorova,  
Andrey Aksenov, Valery Kagadey*



## **8. Experimental Results of Power Electronics Devices Control Systems Based on a Real-time Operating System**



Alexander Rozhkov  
National Research University  
"Moscow Power Engineering  
Institute"

*Alexander Rozhkov, Pavel Rashitov, Roman Krasnoperov*

## **9. Trends in the Power Electronics Development**

Svetlana Filatova  
Federal Institute of Industrial  
Property

*Svetlana Filatova, Alexey Chekhovskikh*

## **10. Development of IGBT Cell Process Model for Serial Transistors**

Andrei Shmakov  
JSC «Silovoy Klyuch»

*Andrey Shmakov, Anastasia Tikhomirova*



# Section: Electrical Engineering

June 29th, 9:00-20:00, Hall E

Section Chairs: Sergey Khalyutin, Anastasia Rusina

## INVITED TALK:

### **Challenges in Design and Certification of Electromechanical Control Systems for More Electric Aircraft (MEA)**

Alexey Pozdeev

"Sarapul Electric Generator Plant" (SEGP)

#### **1. Methodology for Determining the Electrophysical Properties of Pipes Made of Structural Steel for Skin Systems**

Aleksandra Vasilenko

National Research University "Moscow  
Power Engineering Institute"

*Maxim Fedin, Aleksandra Vasilenko, Denis Zhgutov, Kirill Severin*

#### **2. Investigation Temperature Control Based on Piezoelectric Resonant Frequency Temperature Sensors for an Electric Heating System**

Aleksandra Vasilenko

National Research University  
«Moscow Power Engineering  
Institute»

*Vladimir Kalinin, Yaroslav Negrobov, Aleksandra Vasilenko, Yaroslav Areev,  
Alexey Geraskin, Pavel Petrov*

#### **3. Analysing Non-Ensemble Machine Learning Methods for Solving the Transient Classification Problem**



Sergey Averyanov

Novosibirsk State Technical University

*Sergey Averyanov, Andrey Trofimov*



**4. Experience in Measuring Switching Overvoltages under Operating Conditions**



Roman Goduntsov

Novosibirsk State Technical University

*Roman Goduntsov*

**5. Features of General Primary Frequency Control in Isolated Power Systems**

Viktoriya Fyodorova

Novosibirsk State Technical University

*Viktoriya A. Fyodorova, Viktor F. Kirichenko, Gleb V. Glazyrin,  
Anastasiya G. Rusina*

**6. Experimental Assessment of the FDD and a Line Trap Mockup Effects on High-Frequency Overvoltages**



Valentin Loman

Novosibirsk State Technical University

*Sergey Korobeynikov, Valentin Loman, Alexander Ridel, Vladimir Shevchenko,  
Viktor Loskutov*

**7. Efficiency Analysis of Location Optimization and Nominal Power of Reactive Power Compensation Devices in The Electric Network Based on Adaptive Particle Swarm Algorithm**



Sergey Mitrofanov

Novosibirsk State Technical University

*Sergey Mitrofanov, Artem Tronin, Pavel Matrenin*

**8. Spatial Analysis of Location and Usage of Public Electric Vehicle Charging Infrastructure in Russian Cities**

Vyacheslav Voronin

T.F. Gorbachev Kuzbass State  
Technical University

*Vyacheslav Voronin, Mukhammad Kurbanbaev*



**9. Artificial Intelligence in Defect Classification Tasks Using the Example of Chromatographic Analysis of Dissolved Gases in Power Transformers**



Maxim Mikhailovich

Tomsk Polytechnic University

*Maxim Mikhailovich, Liudmila Khudonogova, Sergey Leonov, Tatyana Mamonova*

**10. Calculation of Charge and Current Characteristics of Partial Discharges in Helium Bubble in Dielectric Liquid from First Principles**



Roman Savenko

Novosibirsk State Technical  
University, NSTU

*Roman A. Savenko, Denis I. Karpov, Alexander V. Ridel, Sergey M. Korobeynikov*

**11. Power Flows Control in a Multi-Source Power Distribution Electrical Network**

Daniil Gusev

Nizhny Novgorod State Technical  
University named after R.E. Alekseev

*Daniil Gusev, Elena Sosnina, Evgeny Kryukov, Rustam Bedretdinov*

**12. Introduction of Fault Location, Isolation, and Service Restoration (FLISR) and Phasor Measurement Unit (PMU) Systems**



Anastasia Khaliman

Novosibirsk State Technical University

*Anastasiia O. Khaliman, YUrij V. Kazancev*

**13. Modeling of Electrical Conductivity of a Nanofluid Based on Transformer Oil**



Vladimir Shevchenko

Novosibirsk State Technical University

*Sergey Korobeynikov, Alexander Ridel, Vladimir Shevchenko,  
Svetlana Bobrovskaya*



**14. CO<sub>2</sub>-Based Occupancy Detection in Apartments: A Longitudinal Study for Enhanced Indoor Comfort and Energy Efficiency**

Hamza Said  
Skolkovo Institute of Science and  
Technology

*Hamza Said, Yasir Khan, Elena Gryazina*

**15. Quantum Key Distribution in Power System Communication**



Zelimkhan Magomadov  
Skolkovo Institute of Science and  
Technology

*Magomadov Zelimkhan, Oleg O. Khamisov*

**16. Analysis of Modern Models Capabilities and Software for Automatic Annotation of Graphical Data in the Power Industry**



Ivan Matveev  
Ural Power Engineering Institute

*Ivan V. Matveev, Alexandra I. Khalyasmaa, Pavel V. Matrenin*

**17. Comparison of Nano-oils with Different Initial Breakdown Voltages**

Aleksandr Ridel

Novosibirsk State Technical University

*Sergey Korobeynikov, Alexander Ridel, Dmitry Vedernikov, Vladimir Shevchenko,  
Svetlana Bobrovskaya, Alexander Bychkov*

**18. Features of Torque and Magnetic Flux Forming for Induction Motor Based Traction Electric Drive with Field-Oriented Control**



Igor Zhurov  
LLC "Engineering Center "Ruselprom"

*Igor Zhurov, Sergey Bayda, Pavel Rozkariaka*



## **19. Wind Power Plant's Efficiency Probabilistic Evaluation Using Different Initial Data Sources**

Andrei Bramm



Ural Federal University named after  
the first President of Russia B.N.  
Yeltsin

*Andrei Bramm, Stanislav Eroshenko, Elena Zinovieva, Elena Korelina*

## **20. Recurrent Neural Networks with Long Short-Term Memory Application to Forecast Internet of Things Gateway Energy Consumption**

Alexandr Kamenskov



Urals Technical Institute of  
Communications and Informatics  
(branch) of federal state government  
budget educational establishment of  
higher education "Siberian State  
University of Telecommunications and  
Informatics" in Ekaterinburg

*Evgenia Yurchenko, Vyacheslav Shuvalov, Alexandr Kamenskov*

## **21. Impact of Condensing Power Plant Parameters on Failure Rates**

Pavel Evseenko

Novosibirsk State Technical University

*Pavel N. Evseenko, Alexandr I. Dvortsevov,  
Anastasia G. Rusina, Anna Y. Arestova*

## **22. Enhancing System Stability through B ESS Integration in Stand-Alone Hybrid Power Systems**



Dmitry Muravyev

Power Conversion Lab

*Vladimir Rebrov, Erik Mulkamanov, Dmitry Muravyev*





**23. Frequency Regulation and Scheduling Framework for Hybrid Energy Systems in Isolated Grids**



Anton Propp  
Skolkovo Institute of Science  
and Technology

*Oleg O. Khamisov, Anton Propp, Stepan Vasilev, Ildar Idrisov*

**24. E-core Transformer Numerical Modeling: Distribution of Electromagnetic Losses Depending on Mesh Parameters**



Valeriia Borovskikh  
Ural Federal University named after  
the first President of Russia  
B.N. Yeltsin

*Valeriia A. Borovskikh, Alexandra I. Khalyasmaa, Andrey M. Bramm*

**25. Energy Transition in Myanmar: Exploring Renewable and Nuclear Options**

Lwin Oo

Novosibirsk State Technical University

*Lwin Ko Ko Oo, Nikita Sergeev, Valentin Loman, Anastasia Rusina*

**26. High-Temperature Buffer Amplifier for Capacitance Load Operation**



Marsel Sergeenko  
Don State Technical University

*Marsel Sergeenko, Nikolay Prokopenko, Alexey Zhuk*

**27. Gallium Arsenide Op-Amp's Output Stage for High Temperature Operation**



Marsel Sergeenko  
Don State Technical University

*Alexey Zhuk, Marsel Sergeenko, Anna Bugakova, Nikolay Prokopenko*



**28. Modeling of Structural Steel Hysteresis for Skin Systems at Industrial and Medium Frequencies**



Yaroslav Areev  
Moscow Power Engineering Institute  
(MPEI)

*Maxim Fedin, Aleksandra Vasilenko, Maria Bulatenko, Yaroslav Areev,  
Ivan Zhmurko, Khasan Sangaliev*

**29. Implementation of Low-Level Control Systems for Power Converters based on Adaptive Artificial Neural Networks**

Daniil Bukin  
National Research University "Moscow  
Power Engineering Institute"

*Roman Krasnoperov, Daniil Bukin, Dmitry Kuzenev, Alexander Mukhin*

**30. Assessment of Technical Potential of Floating Solar Panels in the Republic of Tajikistan**



Sherkhon Sultonov  
Tajik Technical University named after  
academician M.S. Osimi

*Sherkhon Sultonov, Javod Ahyoev, Hotamjon Zamonov, Sharipov Fazliddin*

**31. Real-Time Hierarchical Optimization Strategy for Distributed Frequency Control and Congestion Management**



Oleg Khamisov  
Skolkovo Institute of Science  
and Technology

*Oleg O. Khamisov*

**32. Single Phase-to-Ground Faults Group Protection Algorithm Based on Zero-Sequence Current Correlation Coefficients for 6-35 kV Distribution Networks**

Ekaterina Filippenko  
Ural Federal University

*Ekaterina Filippenko, Sergei Dekhtiar, Aleksei Sofronov*



**33. Analysis of Operating Modes of a Bidirectional Quasiresonant DC Voltage Converter as Employed in Energy Storage Systems**



Konstantin Shirshin  
Nizhny Novgorod Research Institute  
of Radio Engineering

*Andrey Serov, Nikolay Vikhorev, Konstantin Shirshin*

**34. Identification of Optimal Electrical Parameters of Units of Modular Quasi-Resonant DC Voltage Converters**



Konstantin Shirshin  
Nizhny Novgorod Research Institute  
of Radio Engineering

*Konstantin Shirshin, Nikolay Vikhorev*

EDM



# Section: Robotics, Mechatronics, and Automation

June 28th, 14:30-20:00, Hall C

Section Chairs: Oleg Nos, Alecksey Anuchin

INVITED TALK:

## **Challenges in Aircraft Electrification and Solutions**

Sergey Khalyutin

Moscow State Technical University of Civil Aviation

## **Standalone Electromechanical Propulsion System**

Alexander Korovin

JSC NPO Almaz named after A.A. Raspletin

### **1. A Probabilistic Mechanism for Safe Reinforcement Learning**

Anton Bolychev

Skolkovo Institute of Science  
and Technology

*Grigory Yaremenko, Anton Bolychev, Georgiy Malaniya, Pavel Osinenko*

### **2. ModuSLAM: a Modular Framework for Factor Graph-based Localization and Mapping**

Mark Griguletskii

Skolkovo Institute of Science  
and Technology

*Mark Griguletskii, Pavel Osinenko*



### **3. Development of a Digital Twin of an Industrial Manipulator Based on the Robot Operating System**

Peter Adel Wakem Awad



Development of a Digital twin  
of an Industrial Manipulator  
based on the Robot Operating  
System

*Peter Awad, Tatyana Mamonova*

### **4. Use of UAV in Areas Where it is Difficult to Ambient Air**

Otabek Djumaniyazov



Tashkent University of Information  
Technologies named after  
Muhammad al-Khwarizmi

*Sherzod Pulatov, Otabek Djumaniyazov, Ibratbek Omonov, Utkir Matyokubov*

### **5. Development of a Mechatronic End-Effector for Robot-Assisted Ultrasound Guided Tool Navigation in Local Destruction Procedures**

Maksim Konovalov



"Russian University of Medicine"  
of The Ministry of Health  
of The Russian Federation

*Maksim Konovalov, Daniil Klimov, Leonid Prokhorenko, Roman Liskevich,  
Yuri Poduraev, Dmitry Panchenkov*

### **6. Expansion of Field Attenuation During Synchronous Speed Control Machine With Permanent Magnets in the Second Zone**

Ilya Ivanov

Novosibirsk State Technical  
University

*Vladimir Anosov, Boris Bochenkov, Denis Kotin, Artem Davydov,  
Stepan Sukhinin, Ilya Ivanov*



**7. A CPU-Efficient Robotic System for Instance Segmentation and Control of Mineral Fertilizer Granulation**

Dmitrii lunovidov

LogicYield LLC

*Dmitrii lunovidov, Vyacheslav Shevchenko, Elizaveta lunovidova, Ikechi Ndukwe*

**8. The application of the linearization method to the numerical solution of the inverse kinematic problem in vertically inhomogeneous media using refracted and scattered signals**



Evgeny Putyata

Novosibirsk State Technical  
University

*Eugene Putyata*

**9. Multicriteria Machine Learning Approach for Wind Turbine Fault Detection Using SCADA Data**



Denis Semenov

ITMO University

*Galina Demidova, Denis Semenov, Xibo Yuan, Anton Dianov,  
Konstantin Savichev, Alecksey Anuchin*

**10. Study of an Electric Drive Control System for Antenna Rotation in a Radar with Account of Non- Linearity of the Magnetic Circuit of a Permanent- Magnet Synchronous Motor**



Andrey Serov

Nizhny Novgorod State Technical  
University n.a. R.E. Alekseev

*Andrey Serov, Maksim Andryukhin, Konstantin Shirshin, Vladimir Titov*



## **11. TangerineVolume Estimation byRANSACon Point Cloud Data**

Ilya Ryakin

Skolkovo Institute of Science  
and Technology

*Ilya Ryakin, Ilya Osokin, Sina Moghimi, Sergei Davidenko, Vladimir Guneavoi,  
Grigory Yaremenko, Pavel Osinenko*

## **12. TangerineVolume Estimation by Point Cloud Data with Neural Networks**

Ilya Osokin

Skolkovo Institute of Science  
and Technology

*Ilya Osokin, Ilya Ryakin, Sina Moghimi, Sergei Davidenko, Vladimir Guneavoi,  
Grigory Yaremenko, Pavel Osinenko*

## **13. Hybrid Simulation and Multi-Agent Decision Support for Bottleneck Optimization in Metallurgical Production**

Lina Sun



Engineering School of Information  
Technologies, Telecommunications  
and Control Systems

*Konstantin Aksyonov, Olga Aksyonova, Elena Aksyonova, Lina Sun, Igor Kalinin*

## **14. The method of mathematical modeling of energy processes as a mathematical basis for digital twins of neural networks**



Igor Starostin

Moscow State Technical University  
of Civil Aviation

*Igor E. Starostin, Sergey P. Khaluytin, Valery I. Bykov*

## **15. Modified Algorithm for Controlling the Traction Electric Motor of a Electric Vehicle.**



Dmitry Ulyanov

Tomsk Polytechnic University

*Alexander G. Garganeev, Ahmed Ibrahim, Dmitry I. Ulyanov*



**16. Technology of 3D Printing of Objects With Carbon Adhesive**

Rustam Farakhov

Kazan (Volga region) Federal  
University

*Rustam R. Farakhov, Rustam A. Burnashev,  
Marina V. Bolsunovskaya, Galim Z. Vakhitov*

**17. Development of a microprocessor quadrotor control system**

Evgenii Khodatovich

Institute of Automation and  
Electrometry SB RAS

*E. V. Khodatovich, K.Yu. Kotov*

**18. On Limitations of Ensuring Stability in Reinforcement  
Learning under Robustifying Control**

Georgiy Malaniya

Skolkovo Institute of Science and  
Technology

*Georgiy Malaniya, Anton Bolychev, Grigory Yaremenko, Pavel Osinenko*





# Section: Software Engineering and Cyber-Physical Systems

June 29th, 9:00-18:00, Hall D

Section Chairs: Vladimir E. Zyubin

## 1. Towards Verification Reflex Programs in the Rodin Platform

Margarita Shabanova

Institute of Automation and  
Electrometry SB RAS

*Margarita Shabanova, Natalia Garanina*

## 2. Using Algorithmic Complexity Metrics for Process-Oriented Specifications



Artyom Abramenko

Novosibirsk State University

*Artyom Abramenko, Vladimir Zyubin*

## 3. Challenges in Automating Error-Fixing Commit Classification for Linux Kernel and Cyber-Physical Systems



Nikolay Golovnev

Polzunov Altai State Technical  
University

*Nikolay Golovnev, Nikita Starovoytov, Sergey Staroletov*

## 4. A method of protecting a program from unauthorized use that is resistant to a brute force attack



Marina Dyachkova

Siberian State University of  
Telecommunications and Information  
Science

*Marina Dyachkova, Ivan Nechta*



**5. Tomographic Reconstruction in the Presence of Internal Radiation Sources on GPU Architecture**



Alexander Peshkov  
Novosibirsk State Technical  
University

*Alexander V. Peshkov*

**6. Foreign function interface for managed runtime systems with lightweight threading**

Rinchin Zapanov

A.P. Ershov Institute of Informatics  
Systems, Siberian Branch of the  
Russian Academy of Sciences

*Rinchin Zapanov*

**7. Semi-Automated Framework for Feature Engineering in Machine Learning and Data Analysis**



Nikita Radeev  
Novosibirsk State University

*Nikita Radeev, Kristina Vinogradova*

**8. Simple Software for Training Artificial Neural Network Models Based on the Block Coding Approach**



Sergei Smirnov  
Tomsk State University of Control  
Systems and Radioelectronics

*Sergei Smirnov, Anton Ivanov*



**9. Generation of Isabelle/HOL Theory Focused on Proving Verification Conditions of PoST Programs and Based on Derived Requirement Patterns**

Ivan Chernenko



Institute of Automation and  
Electrometry of the Siberian Branch  
of the Russian Academy of Sciences  
(IA&E SB RAS)

*Ivan Chernenko, Igor Anureev*

**10. Verification Condition Generator for Revised Reflex Language Using Isabelle/HOL**

Artyom Ishchenko

Institute of Automatics and  
Electrometry

*Artyom D. Ishchenko, Igor S. Anureev*

**11. Unveiling Themes in Social Media Data: A Two-Stage Hashtag-Driven Clustering and Classification Method in Uzbek Language**



Nilufar Abdurakhmonova

National University of Uzbekistan  
named after Mirzo Ulugbek

*Rano Sayfullaeva, Raima Shirinova, Nilufar Abdurakhmonova*

**12. Detecting and Analysing Cyber Attacks Based on Graph Neural Networks, Ontologies and Large Language Models**

Georgii Abramenko



Saint Petersburg National Research  
University of Information  
Technologies, Mechanics and Optics  
(ITMO University)

*Igor Kotenko, Georgii Abramenko*



### 13. Graph Clustering for Application to the Shortest Path Search Problem



Arthur Astakhov  
Peter the Great St. Petersburg  
Polytechnic University

*Arthur Astakhov, Lyudmila Chernenkaia*

### 14. Hybrid Analysis for Karakalpak Language: Combining Statistical Model and Rules-based Approach



Nodirbek Boltayev  
Peter the Great St. Petersburg  
Polytechnic University

*Nodirbek Boltayev, Umid Kuziyev, Gulchehra Umurzakova, Bakhtiyar Rakhimov,  
Nargiza Inogamova, Nafisa Erimmetova*

### 15. Multi-topic Classification of Uzbek Texts Using Rule-based System and Machine Learning



Nodirbek Boltayev  
Urgench branch of Tashkent  
University of Information  
Technologies named after  
Muhammad al-Khwarizmi

*Nodirbek Boltayev, Marina Tsoy, Giyosiddin Abduvakhobov,  
Kunduz Ibodullayeva, Umida Askarova, Mukhlisa Rashidova*

### 16. Streaming Hamiltonian Monte Carlo with Smooth Data Drift Adaptation

Alexey Calabourdin  
Ural Federal University, named after  
the first President of Russia,  
Boris Yeltsin

*Alexey V. Calabourdin, Konstantin A. Aksenov*



## **17. GIS Plugin for Planning Movement on Various Types of Roads**



Alexandr Bychkov

MIREA - Russian technological  
university

*Alexander Bychkov, Alexey Romanov*

## **18. Extracting RTA Location and Time from Russian News: Combining Traditional Methods with Llama LLM Validation**



Alexey Girin

ITMO University

*Alexey Girin, Nikolay Teslya*

## **19. Anomaly Detection in Containerized Systems Based on System Call Histograms and Autoencoder Neural Network**



Maxim Melnik

Federal State Budgetary Institution of  
Science "St. Petersburg Federal  
Research Center of the Russian  
Academy of Sciences" (SPb FRC  
RAS)

*Igor Kotenko, Maxim Melnik*

## **20. Application of Machine Learning Methods and Hybrid Modeling for Predicting the Remaining Useful Life of Equipment**



Vladislav Pisarev

Sevastopol State University, Institute  
of Radio-Electronics and Intelligent  
Technical Systems

*Vasiliy Alchakov, Vladislav Pisarev*



## 21. Information Security Risks in Smart Home Systems

Alisher Salaev



Urgench Branch of Tashkent  
University of Information  
Technologies named after  
Muhammad Al-Khwarizmi

*Temur R. Khudayberganov, Artyom A. Ruzmetov, Temur T. Turdiyev,  
Alisher K. Salayev, Bahrombek I. Sabirov*

## 22. Regelum: Graph Dependency Resolution and Execution Orchestration for Control Systems

Georgiy Malaniya

Skolkovo Institute of Science and  
Technology

*Georgiy Malaniya, Anton Bolychev, Pavel Osinenko, Grigory Yaremenko*

## 23. Using the Simulink Simulation Package in the Practice of Creating Components of Digital Doubles of the Operating Conditions of Devices



Margarita Syabro

Don State Technical University

*Maksim Sukhanov, Margarita Syabro, Gurgen Ambartsumyan,  
Kaleria Moroz, Nikolay Limarenko*

## 24. Using NLP Tools for Linking Materials Within the "Pushkin Digital" Resource



Nikolay Teslya

St. Petersburg Federal Research  
Center of the Russian Academy of  
Sciences

*Nikolay Teslya*



## 25. Linking Related Entities by Textually Described References



Nikolay Teslya

St. Petersburg Federal Research  
Center of the Russian Academy of  
Sciences

*Georgii Sipovskii, Nikolay Teslya*

EDM



# Section: Biomedical Electronics and Engineering

June 29th, 15:00-19:00, Hall A

Section Chairs: Gennady Evtushenko, Konstanin Brazovsky,  
Vasilii Borisov

## 1. Use of Heart and Lung Auscultation Simulators

Anastasia Gorodova  
Novosibirsk State Technical  
University

*A.A. Gorodova, A.K. Gerasimov*

## 2. Recorder for the Diagnosis of Diseases Protein Markers

Alina Eremina  
SRC VB «Vector» of  
Rospotrebnadzor

*Alina N. Eremina, Anastasia A. Cheremiskina, Danil E. Serdyuk,  
Daniel V. Shanshin, Victoria K. Grabezova, Vladimir M. Generalov*

## 3. Assessment of Dose Loads and Radiation Risk as a Result of Exposure to Radon on Basement and Basement Workers in Novosibirsk



Nikita Barilo  
Novosibirsk State Technical  
University

*Nikita Barilo. Evgeniy Udaltsov*





**4. Compression and Noise-tolerant Coding in Data Transmission in Non-invasive Electrocardiodiagnostic System**



Andrey Bodin

National Research University  
«Moscow Power Engineering  
Institute»

*Oksana Bezborodova, Andrey Bodin, Oleg Bodin, Mikhail Kramm,  
Mikhail Edemsky, Dmitry Martinov*

**5. ECG-Based Biometric Identification: An Overview of Professional Equipment and Smartwatch Data**

Sofia Zhdanova

Irkutsk State Transport University  
Faculty of Transport

*Sofia Zhdanova, Anton Dolganov, Aleksei Zhdanov*

**6. An Improved Method for Assessing Psychoemotional State Based on Analysis of Body's Functional Systems**

Vasiliy Zhigachev

Penza State Technological  
University

*Oleg Bodin, Vasiliy Zhigachev, Mikhail Edemskiy*

**7. Non-Volatile Resistive Switching of Coagulated Blood Film Based Biomemristor under Electric Field and UV Radiation**



Ekaterina Klyukina

Institute of Microelectronics  
Technology of Russian Academy of  
Sciences

*Ekaterina Klyukina, Alexandr Vankaev, Sergey Koveshnikov, Mikhail Fedotov*



**8. Modification of Convolutional Neural Networks for Brain Tumor Segmentation on MRI with Limited Computational Resources**



Anton Pashkov  
Novosibirsk State Technical  
University

*Nikita M. Gorlov, Anton A. Pashkov, Maxim A. Bakaev*

**9. Formation of Carbon Nanomaterials Layers to Create Passive and Active Implantable Devices for Nerve Tissue Repair**

Denis Murashko  
National Research University of  
Electronic Technology (MIET)

*Denis Murashko, Ulyana Kurilova, Mikhail Savelyev, Sergey Selishchev*

**10. New Effects of Haloperidol**

Nina Pestereva  
Federal State Budgetary Scientific  
Institution «Institute of Experimental  
Medicine»

*Nina Pestereva, Vadim Sizov, Dmitrii Traktirov, Regina Cherkassova*

**11. Simulation Models of Electrophysiological Signals Test Sequences for Monitoring Devices of Medical Diagnostics**



Anton Syomin  
Penza State Technological  
University

*Margarita Sidorova, Anton Semin*

**12. Development of the Gastro-AI Model for Diagnosing Gastrointestinal Diseases: Based on The Hyperkvasir**



Husan Olimboyev  
Urgench branch of TUIT

*Husan Olimboyev, Hasan Olimboyev, Gulora Razzakova, Jushkinbek Yuldoshev,  
Ikrom Djabbarov, Oygul Khujaniyozova*



## Section: Health Informatics and Digital Humanities

June 28th, 14:30-19:00, Hall D

Section Chairs: Alexander Savostyanov, Vladimir Zyubin,  
Grigorii Khazankin

### INVITED TALK:

#### **Information-based Approaches to Identifying Markers of Affective and Cognitive Disorders based on the Analysis of Behavioral and Physiological Data**

Alexander Savostyanov  
Novosibirsk State University

#### **1. Development of a Neurolinguistic Testing Technique to Identify Brain Self-Referential Processes**

Sofia Zlaia

Novosibirsk State University

*Sofia Zlaia, Nadezhda Istomina, Valentina Stepanova, Vasily Savostyanov,  
Sergey Tamozhnikov*

#### **2. Development of a Technology for Assessing the Risk of Psychosomatic Disorders in Russian and Foreign Students During Adaptation to Academic Stress**



Dmitri Lebedkin

Novosibirsk State University

*Dmitri Alekseevich Lebedkin, Kseniya Zorina, Vladimir Bodur, Ekaterina Ivanova,  
Sergey Moiseev, Alexander Savostyanov*

#### **3. Analysis of Equivalent EEG Dipoles During Cooperation and Competition in a Computer Game**



Dmitri Lebedkin

Novosibirsk State University

*Dmitri Lebedkin, Andrey Bocharov, Sergei Tamozhnikov,  
Ekaterina Merkulova, Gennady Knyazev*



**4. Using Machine Learning Methods to Search for EEG and Genetic Markers of Depressive Disorder**

Kseniya Zorina

Novosibirsk State University

*Kseniya Zorina, Andrey Kriveckiy, Darya Klemeshova,  
Andrey Bocharov, Vitaliy Karmanov*

**5. Development of a Comprehensive Methodology for Assessing Executive Control Measures and Its Validation on Groups of Russian and Foreign Students**

Kseniya Zorina

Novosibirsk State University

*Kseniya Zorina, Vladimir Bodur, Evgeny Vergunov, Marina Tolstova*

**6. Digital Organizational Culture is Component of Technology Transfer in the Educational Environment**



Alexander Goltsev

Reshetnev Siberian State University  
of Science and Technology

*Ekaterina Sumina, Artem Badyukov, Alexander Goltsev*

**7. Prediction of Anxiety Levels Based on Spatial-Frequency Patterns of EEG Activity During Perception of Another Person's Face**



Victor Lozhnikov

Novosibirsk State University

*Victor Lozhnikov*

**8. Employing Argumentation Patterns for Genre Classification of Scientific Communication Texts**



Ivan Pimenov

Ershov Institute of Informatics  
Systems

*Ivan S. Pimenov, Natalia V. Salomatina*



**9. Validation of The Russian Version of the Broad Autism Phenotype Questionnaire in a Russian Speaking Sample of Neurotypical Subjects**

Dmitriy Kuleshov

Institute of Cytology and Genetics,  
Siberian Branch of Russian  
Academy of Sciences

*Dmitriy Kuleshov, Mikhail Vlasov, Evgeny Vergunov*

**10. Methods of Automatic Selection of Named Entities (NER) in Uzbek Language for Text Tone Analysis**



Bobur Saidov

Novosibirsk State University

*Bobur R. Saidov, Vladimir B. Barakhnin, Ulugbek T. Rixsibayev,  
Ogabek O. Sobirov, Khikmat M. Bekchanov, Elbek J. Sharipov*

**11. BPsim Decision System and Twin Intelligent Language Processing: Developing Domain-Specific Expert Systems**



Lina Sun

Engineering School of Information  
Technologies, Telecommunications  
and Control Systems

*Konstantin A. Aksyonov, Lina Sun, Olga P. Aksyonova, Elena K. Aksyonova,  
Igor A. Kalinin*

**12. Depression Detection through EEG Signal Analysis: A Convolutional Autoencoder Deep Learning Model**



Neda Firoz

Tomsk State University

*Neda Firoz, Sergey Aksyonov Vladimirovich, Olga Grigorievna Berestneva,  
Alexander Savostyanov*

**13. Development of a Personalized Recommendation System with High Data Protection**

Olesya Palchunova

Novosibirsk State University

*Olesya Palchunova*



## Section: Materials Science

June 29th, 14:00-16:30, Hall C

Section Chair: Ivan Bataev

- 1. Influence of Generation and Recombination of Oxygen Vacancy-Ion Pairs on Non-Stationary Heat Transfer and Mass Transfer and Their Effect on the Memristor Electrical Properties**

Baurzhan Gabdulin

Tyumen State University

*Baurzhan Gabdulin, Alexander Busygin, Sergey Udovichenko*

- 2. Hybrid Nanostructures Based on Carbon Nanotubes and Graphene, Functionalized with BaO Nanoparticles having Improved Emission Properties**

Artem Kuksin

National Research University of  
Electronic Technology (MIET)

*Artem Kuksin, Yury Shaman, Evgeny Kitsyuk, Artem Sysa, Elena Eganova,  
Alexander Gerasimenko*

- 3. Role of Organic Surfactants in Achieving Optimal Single-Walled Carbon Nanotube Dispersion Media for Biomedical Conductive Composite Coatings**

Kristina Popovich

National Research University of  
Electronic Technology (MIET)

*Kristina Popovich, Evgenia Kuznetsova, Pavel Vasilevsky, Alexander Gerasimenko*

- 4. Phase Transformations Kinematic Model in Steel Austenization Process**



Vyacheslav Parmenov

Saint Petersburg Electrotechnical  
University ETU "LETI"

*Vyacheslav Parmenov, Fedor Chmilenko, Yuriy Perevalov*



## **5. Mechanochemical In Situ Formation of TiC in a Copper Matrix**

Natalya Ridel

Institute of Solid State Chemistry and  
Mechanochemistry of the Siberian  
Branch of the Russian Academy of  
Sciences (ISSCM SB RAS)

*Tatiana Fedorovna Grigoreva, Natalya Sergeevna Ridel,  
Svetlana Anatolievna Kovaleva, Evgeniya Timofeevna Devyatkina,  
Sergey Vladimirovich Vosmerikov*

## **6. Adsorption and Diffusion of In and Bi adatoms on (0001) surfaces of $\beta$ -phase $\text{In}_2\text{Se}_3$ and $\text{Bi}_2\text{Se}_3$**

Anastasia Ryabishchenkova

Rzhanov Institute of Semiconductor  
Physics SB RAS

*Anastasia Ryabishchenkova, Dmitry Rogilo, Vladimir Kuznetsov, Dmitry Sheglov,  
Alexander Latyshev*

## **7. Sub-THz electrophysical properties of materials for 3D printing radio electronic equipment case**



Diana Pidotova

National Research Tomsk State  
University

*Diana A. Pidotova, Daria A. Frolova, Alexander V. Badin, Ivan A. Vertoprakhov,  
Anton N. Elyasov, Daria C. Katelina*

## **8. Optical Properties of Hf-Ti-O Films Obtained by Atomic Layer Deposition**

Eugene Khizhnyak

Nikolaev Institute of Inorganic  
Chemistry SB RAS

*Evgeny Khizhnyak, Vladimir Shayapov, Irina Yushina, Mikhail Lebedev*

## **9. Synthesis and Study of Al:HfO<sub>2</sub> Thin Films for Memristors. Structural and Properties**

Nikita Shulaev

Tyumen State University

*Nikita Shulaev, Andrey Bobylev, Sergey Udovichenko, Maxim Grigoriev,  
Nikita Azarapin*



# Young Professionals Involvement (YPI) Competition

June 28th, 19:00-21:00, Hall E

Section Chair: Anna Kazmina

## **1. Analysis and Design of Common Channel Precoding Algorithms for RSMA**

Artyom Shinkevich

Tomsk State University of Control  
Systems and Radioelectronics

*Artyom Shinkevich, Dmitry Pokamestov, Yakov Kryukov, Georgiy Shalin,  
Eugeniy Rogozhnikov*

## **2. Development and Implementation of Application for Automation of the Synchrotron Radiation Technological Station**

Ivan Kopalkin

Budker Institute of Nuclear Physics  
of Siberian Branch Russian  
Academy of Sciences (BINP SB  
RAS)

*Ivan Kopalkin, Boris Goldenberg*

## **3. Methodology for Determining the Electrophysical Properties of Pipes Made of Structural Steel for Skin Systems**

Aleksandra Vasilenko

National Research University  
"Moscow Power Engineering  
Institute"

*Maxim Fedin, Aleksandra Vasilenko, Denis Zhgutov, Kirill Severin*





**4. CO<sub>2</sub>-Based Occupancy Detection in Apartments: A Longitudinal Study for Enhanced Indoor Comfort and Energy Efficiency**

Hamza Said  
Skolkovo Institute of Science and  
Technology

*Hamza Said, Yasir Khan, Elena Gryazina*

**5. A CPU-Efficient Robotic System for Instance Segmentation and Control of Mineral Fertilizer Granulation**

Dmitrii Lunovidov  
LogicYield LLC

*Dmitrii Lunovidov, Vyacheslav Shevchenko, Elizaveta Lunovidova, Ikechi Ndukwe*

**6. Towards Verification Reflex Programs in the Rodin Platform**

Margarita Shabanova  
Institute of Automation and  
Electrometry SB RAS

*Margarita Shabanova, Natalia Garanina*

**7. Recorder for the Diagnosis of Diseases Protein Markers**

Alina Eremina  
SRC VB «Vector» of  
Rosпотребнадзор

*Alina N. Eremina, Anastasia A. Cheremiskina, Danil E. Serdyuk,  
Daniel V. Shanshin, Victoria K. Grabezova, Vladimir M. Generalov*

**8. Formation of Carbon Nanomaterials Layers to Create Passive and Active Implantable Devices for Nerve Tissue Repair**

Denis Murashko  
National Research University of  
Electronic Technology (MIET)

*Denis Murashko, Ulyana Kurilova, Mikhail Savelyev, Sergey Selishchev*



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