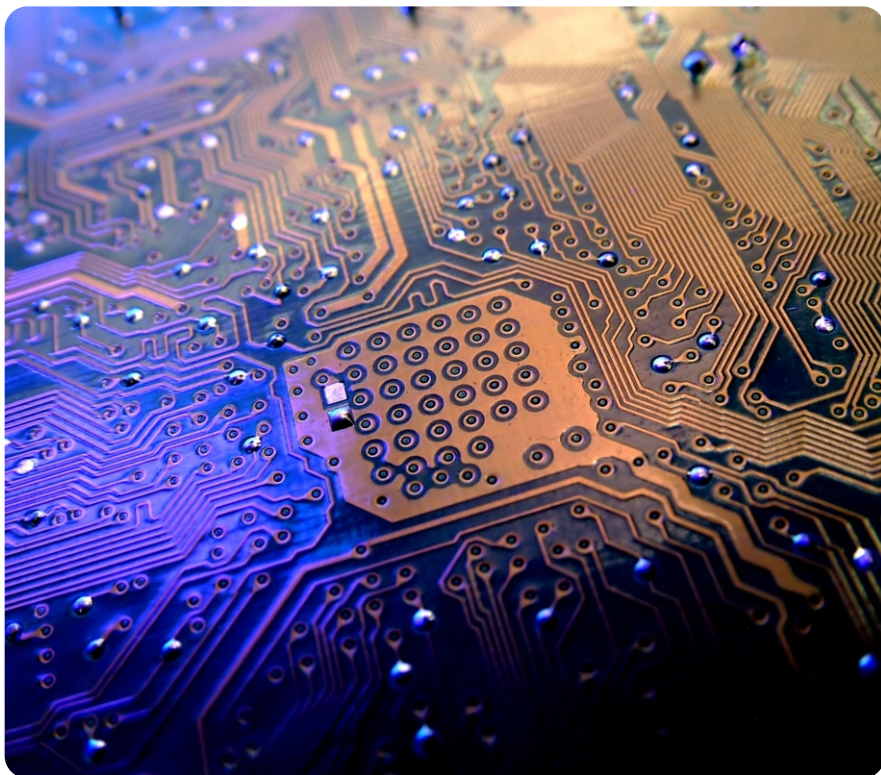# APEIE25

**Actual Problems
of Electronic Instrument
Engineering**

14–16.11.25



# CONF
# PROGRAM

**APEIE 25 Conference Brief Schedule**
**Dates:** November 14–16, 2025 **Time Zone:** UTC+7 (NOVT)
**Venue: Azimut Hotel** Address: *Novosibirsk, Lenina Street, 21*

**November 14 (Friday)**
**09:00** Participant Registration and Welcome Coffee Break
**10:00** Official Opening Ceremony of the Conference (Sammit Hall)
**10:30** Plenary Session (Sammit Hall)
**13:00 – 14:00** Lunch Break
**14:00** Round Table: "Mechanism of Creating Basic Departments in Technical Universities" (Forum1 Hall)
**14:00** Electrical Engineering and Power Engineering (Conference Hall)
**14:30** Radio Engineering and Telecommunication Systems (Sammit Hall 1)
**14:00** Automation and Information-measuring Technologies (Assambleya Hall, Sammit 2)
**14:00** Optical and Laser Technologies (Panorama Hall)
**14:00** Natural Language Processing (Virtual Hall 1, Online)
**16:00 – 16:30** Coffee Break

**November 15 (Saturday)**
**09:00** Mathematical Modeling of Processes and Systems (Forum1 Hall)
**10:00** Medical Electronic Devices and Biotechnology (Panorama Hall)
**10:00** Electrical Engineering and Power Engineering (Conference Hall)
**10:00** Radio Engineering and Telecommunication Systems (Sammit Hall 1)
**10:00** Automation and Information-measuring Technologies (Assambleya Hall)
**10:30** Electronic Devices Nanotechnology and Microsystem Technology (Sammit Hall 2)
**12:00** V International Symposium on Knowledge-Ontology-Theory (KNOTH 2025) (Virtual Hall 2, Online)
**13:00 – 14:00** Lunch Break
**16:00** Official Closing Ceremony
**17:00** Closing Cocktail Reception for Networking

**November 16 (Sunday)**
**10:00 – 13:00** Cultural Program: Guided Tour of Novosibirsk City for Interested Participants *(Tour starts from Azimut Hotel, Novosibirsk)*

# Content

- online report

Time zone - UTC+7 NOVT

# Plenary Session

November 14, 10:00-13:00, Hall SAMMIT

**10:00 – Official Opening Ceremony of the Conference**

1. **New Functionality and Applications of Sensor Systems based on Specialty Multimode and Multicore Optical Fibers – 10:30**

   Sergey Babin

   Institute of Automation
   and Electrometry SB RAS

2. **Predictive Control Methodology Based on Digital Twin Technology for Electric Power Systems – 11:00**

   Sergey Khalyutin

   Moscow State Technical
   University of Civil Aviation

3. **Computational Modeling of the Human Brain in Neurology and Neurosurgery – 11:30**

   Anton Pashkov

   Federal Center of Neurosurgery of
   the Ministry of Health of the RF

4. **Landscape and Challenges in Communication Middleware for HPC and AI Systems – 12:00**

   Mikhail Kurnosov

   Siberian State University
   of Telecommunications and
   Information Sciences

5. **Official Signing Ceremony of the Agreement between the "Module" Research Center and SibGUTI – 12:30**

   | Alexandr Efimov | Khalil El-Khajj |
   | SibGUTI | Research Center "Module" |

# Section: Electronic Devices Nanotechnology and Microsystem Technology

November 15, 10:30-15:00, Hall SAMMIT 2

Section Chairs: Valery Dragunov, Dmitriy Ostertak, Alexander Milekhin

INVITED TALK:

## Electrically Conductive Polymer Composites as the Basis for New Flexible Electronic Components

Vitalii Kuznetsov

Nikolaev Institute of Inorganic Chemistry of the SB RAS, Novosibirsk State Technical University

**1.** **Magnetic Shielding of Gyrotron Complexes on the ITER**

Aleksandr Aktanaev

Institute of Applied Physics of the Russian Academy of Sciences

*A.V.Aktanaev, M.D.Proyavin*

**2.** **Neuromorphic Ferroelectric Devices After Swift Heavy Ion Implantations**

Valentin Antonov

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

*Valentin Antonov, Vladimir Popov, Vladimir Zhilitskiy, Anton Gutakovskii, Vladimir Vdovin, Andrey Miakonkikh, Konstantin Rudenko*

3. **A Comparative Analysis of the Technologies for Moving Element Formation in a Resonant Pressure Sensor**

Alena Talovskaia

Tomsk State University of Control Systems and Radioelectronics (TUSUR)

*Alena Talovskaia, Ivan Kulinich, Evgenij Barbin, Denis Mokhovikov, Sergey Vtorushin, Andrei Esipov*

4. **Development of Terahertz Photoemission Light Detectors with a Nanoscale Interelectrode Gap**

Dmitriy Chesnokov

Novosibirsk State Technical University

*Dmitry Chesnokov*

5. **Simple Offset & Gain Mismatch Calibration for Sigma-Delta Analog-To-Digital Converter**

Vladislav Kostyuchenko

Novosibirsk State Technical University / SibIS LLC

*Vladislav V. Kostyuchenko, Anton A. Cherepanov*

6. **Structural and Transport Properties of Unstressed In0.16Ga0.84As Layers Grown on GaAs Substrates**

Vadim Kuznetsov

Novosibirsk State Technical University

*Vadim Kuznetsov, Dmitry Protasov, Dmitry Dmitriev, Kirill Svit, Sergey Ponomarev, Dmitry Gylyaev*

7. **Verification Methods for BPF-based DPU**

Danila Lisovsky

Ural Federal University

*Danila Lisovsky, Valery Slizkoy, Egor Kuznetsov*

## 12. Comparison of FinFET Parameter Extraction Using MBP and MATLAB

Nikolai Zhegalov

National Research University of
Electronic Technology (MIET)

*Nikolai Zhegalov, Daria Ryzhova*

# Section: Medical Electronic Devices and Biotechnology

November 15, 10:00-15:00, Hall PANORAMA

Section Chairs: Liliya Lisitsyna, Ekaterina Litvinova, Anna Kazmina

INVITED TALK:

### Polymer Magnetic Carriers of Drugs for Magnetic Therapy under an Extra Low Frequency Alternating Magnetic Field and for Sensor Devices

Maria Lomova

Saratov State University

1. **User Functional State Assessment in VR Using Medical-Grade Eye-Tracking: Correlation with Simulator Sickness**

Vasilii Borisov

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

*Yuriy V. Gnevashev, Timur S. Petrenko, Vasilii I. Borisov*

2. **Development of a Device for Conservative Treatment of Diabetic Foot Syndrome**

Anton Polishchuk

Siberian Scientific-Research and Testing Center for Medical Engineering

*Dmitriy Belik, Vasiliy Belik, Viktor Drobyshev, Anton Polishchuk, Igor Popov, Olga Sazonova*

3. **Optimization Study of the Sample-and-Hold Circuit for Biomedical SAR ADC**

Altantsooj Batsukh

National University of Mongolia

*Altantsooj Batsukh, Naranmandakh Ankhbayar, Bolormaa Dalanbayar*

4. **New Physiotherapy Device for Veterinary Medicine**

Aleksandr Pavlov

Novosibirsk State Technical University

*Aleksandr Valerievich Pavlov*

5. **Volumetric Hydro-abrasive Grinding Machine**

Aleksey Alimov

Novosibirsk State Technical University

*Semyon Fizik, Alexey Alimov*

6. **Survival of Cancer Cells Under Different Cold Plasma Jet Initiation Methods**

Elena Milakhina

Rzhanov Institute of Semiconductor Physics SB RAS

*Elena Milakhina, Pavel Gugin, Gleb Shevchenko, Dmitry Zakrevsky, Olga Koval, Mikhail Biryukov, Alina Polyakova*

7. **Multi-Modal Fusion of EEG and Genetic Markers for Depression Prediction from ICBrainDB**

Neda Firoz

Tomsk State University

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

8. **Isolation of Lactic Acid Bacteria from Local Medicinal Plants and Formulation of A Biologically Active Supplement Based on Them**

Gullola Bekmurodova

Institute of Microbiology, Academy of Sciences of the Republic of Uzbekistan

*Gullola Bekmurodova, Shahlo Miralimova*

9. **Intelligent Interfaces and Their Application in Rehabilitation Systems for Patients with Limited Mobility**

Eldar Magerramov

Institute of Automation and Electrometry SB RAS

*Eldar A. Magerramov, Valery D. Yurkevich*

10. **Device for Determining the Sensitivity of the Oral Cavity**

Sana Abylgazinova

Kazakh National Research Technical University named after K.I. Satbayev

*Chingiz Alimbayev, Kassymbek Ozhikenov, Nurlan Bayanbay, Zhadyra Alimbayeva, Sana Abylgazinova, Akzhol Nurdanali*

11. **Modeling the Influence of the Ultrasound Instrument Position and Heat Energy on Vein Occlusion During Endovenous Ultrasound Ablation**

Eugenia Titova

Bauman Moscow State Technical University

*Anna S. Borde, Diana Yu. Sokolova, Eugenia A. Titova, Irina V. Khaydukova, Mikhail S. Kostin, Nikita V. Belikov*

12. **Modeling Cell Division In Biobatteries**

Abrorjon Turgunov

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Mohiniso Hidirova, Abrorjon Turgunov, Salaxidin Nasridinov*

13. **Information System for Storing and Analyzing Speech Signals of People with Mental Retardation**

Alan Alimuradov

Penza State University

*Alan Alimuradov, Alexander Tychkov, Yulia Allanova, Anna Tychkova, Denis Chernyshov, Anna Mamonova*

## 14. Features of the Implementation of an Obstacle Detection System for the Blind

Viktor Smirnov

Novosibirsk State Technical University

*Viktor Smirnov, Andrey Nikulin, Anna Kazmina*

# Section: Electrical Engineering and Power Engineering

November 14, 14:00-18:30, Hall CONFERENCE
November 15, 10:00-16:00, Hall CONFERENCE

Section Chairs: Denis Kotin, Pavel Matrenin

THE FIRST DAY:

1. **Approach to Evaluating Fidelity and Consistency of Rule-based Explanations of Machine Learning Models**

   Pavel Matrenin

   Ural Federal University

   *Pavel Matrenin, Alexandra Khalyasmaa*

2. **The Development of Model for Forecasting the Parameters of Energy Systems**

   Yuriy Klimenko

   Voronezh institute of high technologies

   *Andrey Preobrazhenskiy, Yuriy Preobrazhenskiy, Tatyana Avetisyan, Yakov Lvovich, Yuriy Klimenko, Ivan Tikhonov*

3. **Problems of Implementing the Control Law in LLC Converters with Different Parameters of the Resonant Circuit**

   Mikhail Korobok

   Higher School of Economics

   *Mikhail Korobok, Mikhail Khlystunov, Ilya Shemolin*

4. **The Applicability of Low-resolution Infrared Cameras for Diagnosing Transformer Substation Equipment Using Computer Vision and AI Methods**

Valeriia Borovskikh

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

*Valeriia A. Borovskikh, Alexandra I. Khalyasmaa, Pavel V. Matrenin*

5. **Improving the Efficiency of General Primary Frequency Control in Isolated Power Systems**

Viktoriya Fyodorova

Novosibirsk State Technical University

*Viktoriya Fyodorova, Viktor Kirichenko, Gleb Glazyrin, Anastasiya Rusina*

6. **Comprehensive Methodology for Relay Protection Coordination in Distribution Networks with Distributed Generation**

Ivan Burdukov

Juru Limited

*Ivan Burdukov*

7. **Optical and Spectral Characteristics of Semi-Transparent PV Panels from Conventional Solar Cells**

Bozorboy Islombekov

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University (TIIAME NRU), and Jizzakh Polytechnic Institute (Uzbekistan).

*Bozorboy Islombekov, Akram Mirzabaev, Mukhriddin Eshkulov, Sharof Qarshiboyev, Mukhiddin Anarbaev, Shukhrat Urinov*

8. **Theoretical and Experimental Study of Semi-transparent PV Panels Based on Conventional Solar Cells for Crop-adapted Agrivoltaics**

Sherzod Qushakov

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University (TIIAME NRU), and Jizzakh Polytechnic Institute (Uzbekistan).

*Sherzod D. Qushakov, Askar Mirzayev, Saidbek Babayazov, Asliddin Khayrullayev, Elnur A. Abdullaev, Boburjon Adilov*

9. **Analysis of the Robustness of Deep Convolutional Neural Networks to Data Augmentation in the Problem of Power Line Insulators Recognition**

Ivan Matveev

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

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

10. **Numerical Analysis of Power Generation Process and Performance on Reverse Electrodialysis for Oceanic Salt Gradient Power**

Hao Chen

China University of Mining and Technology

*Nianchun Zhang, Hao Chen*

11. **A Novel Multilevel T-Type Reconfigurable Power Converter for Switched Reluctance Motors in New-Energy Vehicles**

Hao Chen

China University of Mining and Technology

*Jinbo Ding, Ha o Chen, Javokhir Toshov, Ali Asghar Memon*

12. **Gallium-Arsenide Operational Amplifier for High Temperature Applications without Current Mirrors**

Marsel Sergeenko

Don State Technical University

*Marsel A. Sergeenko, Dmitriy V. Kleimenkin, Nikolay N. Prokopenko*

13. **Semi-Transparent Photovoltaic Panels for Greenhouses: Experimental Study on Microclimate, Crop Growth, and Dust Mitigation**

Sherzod Qushakov

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University (TIIAME NRU), and Jizzakh Polytechnic Institute (Uzbekistan).

*Sherzod D. Qushakov, Akram M. Mirzabaev, Mukhriddin U. Eshkulov, Komila Akhadova, Ilkhom I. Pirnazarov, Asliddin Khayrullayev*

14. **Design and Evaluation of a PV-Direct DC Surface Pumping System for Multi-Storey Residential Water Supply in Uzbekistan**

Mukhriddin Eshkulov

Digital Technologies and Artificial Intelligence Research Institute and Jizzakh polytechnic institute,

*Mukhriddin O. Eshkulov, Rustam Kh. Khamdamov, Abbos Begimov*

15. **Performance Comparison of East–West Bifacial and South-Facing PV Panels Using Mathematical Modeling under Uzbekistan's Climatic**

Muhriddin Eshkulov

Digital Technologies and Artificial Intelligence Research Institute and Jizzakh polytechnic institute,

*Sherzod D. Qushakov, Akram M. Mirzabaev, Bozorboy Islombekov, Mukhiddin Anarbaev, Shukhrat S. Urinov, Furkat Rakhmanov*

**16. The Torque Maximum Control of the Synchronous Reluctance Machine under the Voltage Limitation**

Mikhail Glazyrin

Novosibirsk State Technical University

*Mikhail V. Glazyrin, Valery D. Yurkevich*

THE SECOND DAY:

**1. A Survey on Time Delay Compensation Methods for Digitally Controlled PWM Drives at Low-Carrier Ratio Operation**

Oleg Nos

Novosibirsk State Technical University

*Oleg V. Nos, Aleksey S. Anuchin, Aleksey O. Nos*

**2. Analysis of Dynamic Characteristics of a Step-up Switching Capacitor Pulse Converter Topology**

Kirill Akhtyrskiy

LLC "Element Technologies"

*Kirill Akhtyrskiy, Mikhail Khlystunov, Alexander Osipov, Ilya Shemolin*

**3. Efficiency Factors of Power Management Using Behind-the-Meter BESS**

Andrey Liven

Kuzbass State Technical University

*Andrey Liven, Fedor Nepsha*

4. **Application Specifics of Fractional-Order Controllers for Electric Drive Control System Tuning**

Ilya Ivanov

Novosibirsk State Technical University

*Rodion Ketov, Andrey Swarovsky, Ilya Sherstobitov, Stepan Sukhinin, Ilya Ivanov, Denis Kotin*

5. **Prevention of Dynamic Instability During Capacity Deficits via Enhanced Voltage-Frequency Regulation**

Zagdkhorol Bayasgalan

Mongolian University of Science and Technology

*Zagdkhorol Bayasgalan, Gankhuleg Davaasambyy, Tsetsgee Bayasgalan, Bat-Undral Baasan, Erdenetuya Myagmar, Anastasia Rusina*

6. **Power Supply with Two DC Components of Current Consumption**

Danil Lyapunov

National Research Tomsk Polytechnic University

*Vladimir Avdzeiko, Anastasia Drozdova, Danil Lyapunov, Alexandra Pravikova, Konstantin Obraztsov, Yuriy Kremzukov*

7. **Development of a Pulse Current Generator for Determining Protection Ratio of Low-Voltage Varistors**

Dmitrii Koryako

Novosibirsk State Technical University

*Dmitry Koryako, Alexander Myulbaer, Anastasia Shanova*

8. **Micro-Hydropower Plants For Individual Electricity Consumers**

Iliaz Turduev

Osh technological university named after M.M. Adyshev

*Turduev Ilyaz Ermekovich, Kochkonbaeva Buazhar Osmonalievna, Abdumitalib uulu Kubatbek, Abdyraeva Nuripa Rahmatillaevna*

9. **Overview of the Main Technological Operations in the Assembly of Power Hybrid Integrated Circuits**

Alexander Danilov

Novosibirsk State Technical University

*Alexander Danilov, Sergej Kharitonov, Valerij Borilenko, Alexander Solodovnikov*

10. **A Comparative Economic Analysis and Selection Algorithm for Decentralized Power Supply Options**

Khurshed Nazirov

Branch of the National Research University "Moscow Power Engineering Institute" in Dushanbe city

*Rustam I. Karimov, Shohin J. Jurazoda, Khurshed B. Nazirov, Zokirjon S. Ganiev*

11. **Development of a Methodology for Assessing the Effectiveness of a Frequency-Dependent Device for the Suppression of Switching and Lightning Overvoltages**

Valentin Loman

Development of a Methodology for Assessing the Effectiveness of a Frequency-Dependent Device for the Suppression of Switching and Lightning Overvoltages

*Sergey Korobeynikov, Valentin Loman, Alexander Ridel, Dmitriy Vedernikov, Nikita Sergeev*

12. **Towards Optimal BMS Design: LSTM-Based State-of-Health Estimation from Raw Operational Data**

Alexey Druzhunin

Moscow Institute of Physics and Technology

*Mikhail B. Perelman, Alexey A. Druzhinin*

13. **Phase and Frequency Shift Control for Inverter-Based Resources**

Oleg Khamisov

Skolkovo Institute of Science and Technology

*Oleg O. Khamisov, Stepan P. Vasilev*

14. **Vibration Analysis of Large Hydropower Units under Different Operating Conditions**

Sherkhon Sultonov

Tajik Technical University named after academician M.S. Osimi

*Ilhom Mahmudov, Sherkhon Sultonov, Sharaf Boboev, Javod Ahyoev, Mirzosharif Rajabov*

15. **Assessment of the Impact of Electrochemical Protection on Induced Voltage on Pipelines**

Anastasia Shanova

Novosibirsk State Technical University

*Shanova Anastasia, Myulbaer Alexander, Koryako Dmitry*

16. **Non-Contact Sensors System Application for Monitoring The Operating Modes Of Overhead Power Transmission Lines**

Andrei Bramm

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

*Andrei Bramm, Stanislav A. Eroshenko, Polyna E. Storozeva, Ilya N. Storozev*

17. **The Laboratory Testing of Non-Contant Sensors System for Monitoring the Operating Modes of Overhead Power Transmission Lines**

Andrei Bramm

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

*Andrei Bramm, Stanislav A. Eroshenko, Polyna E. Storozeva, Ilya N. Storozev*

18. **Continuous Transfer Function to Discrete Estimation Using Exact Poles and Approximate Zeros for Control and Output LC-filters**

Timur Zhoraev

National Research University of Electronic Technology

*Sergey Evdokimov, Anatoliy Shchagin, Alexey Leontiev, Timur Zhoraev, Alexey Potapov*

19. **Intelligent Decision Support Tools for Trouble-Free Operation of Power Transformers**

Alexander Zelenskikh

Novosibirsk State Technical University

*Vladimir Levin, Alexander Zelenskikh, Sofia Zelenskikh*

# Section: Radio Engineering and Telecommunication Systems

November 14, 14:30-19:30, Hall SAMMIT 1
November 15, 10:00-15:00, Hall SAMMIT 1

Section Chairs: Alexey Vostretsov, Andrei Nikulin

THE FIRST DAY:

1. **Comparative Analysis of the Efficiency of Entropy Codes and Recommendations for Their Use**

Andrey Fionov

Siberian State University of Telecommunications and Information Science

*Boris Ryabko, Andrey Fionov, Ivan Baksheev, Vyacheslav Zhuravlev*

2. **Determination of Angular Coordinates of Active Interference in the Adaptive Antenna Array of Acoustic Locator**

Sergey Eremeev

Tomsk State University of Control Systems and Radioelectronics

*Ivan Rybakov, Nikolay Krasnenko, Sergey Eremeev*

3. **Analyzing the Characteristics of a Differential Transmission Line with Single Modal Reservation Before and After Failures**

Sergey Morozov

Tomsk State University of Control Systems and Radioelectronics

*Sergey Vlasov, Sergey Morozov*

**4.** **Control of Data Rate For Phase-Shift Keying Signals**

Nikita Kramarenko

Vladimir State University named after
Alexander and Nikolay Stoletovs

*Peter Polushin, Natalia Korneeva, Nikita Arkhipov, Nikita Kramarenko*

**5.** **Compact Stripline Rejecting Bandstop Filter**

Ilya Govorun

Kirensky Institute of Physics

*Aleksandr Leksikov, Ilya Govorun, Aleksey Afonin, Andrey Ugryumov*

**6.** **Reflectarray Antenna with Hat-Feed for Ku-band DBS Receiving**

Dmitriy Shabanov

Kirensky Institute of Physics, Federal
Research Center KSC SB RAS

*Dmitriy Shabanov, Konstantin Lemberg, Nikita Sivov, Daniil Rimatsky, Nikita Marushchenko*

**7.** **Evaluation of Hybrid Precoder Design with Imperfect CSI Conditions**

Aleksandr Kalachikov

SIBERIAN STATE UNIVERSITY OF
TELECOMMUNICATIONS AND
INFORMATION SCIENCE

*Alexander A. Kalachikov*

**8.** **Algorithm for Optimizing the Process of Collecting and Processing Data in a Telemetric System for Geoecological Monitoring of Man-Made Objects in Hard-to-Reach Areas**

Oleg Kuzichkin

Bauman Moscow State Technical
University (BMSTU)

*Oleg Kuzichkin, Gleb Vasiliev, Igor Konstantinov, Dmitry Surzhik*

9. **Sensor Node Based on Differential Measuring Transducer for Adaptive Data Transmission nn Wireless Sensor Networks of IoT Systems**

Oleg Kuzichkin

Bauman Moscow State Technical University (BMSTU)

*Oleg Kuzichkin, Igor Konstantinov, Gleb Vasiliev, Dmitry Surzhik*

10. **Approach to Development of Secure Decentralized Wireless Sensor Network for Connected Unmanned Aerial Vehicles**

Vasily Desnitsky

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

*Vasily Desnitsky*

11. **Litho-Density Gamma-Gamma Logging Module**

Semyon Shaparyov

Novosibirsk State Technical University

*Semyon Shaparyov*

12. **A Big Data Transmission System Reliability Parameters Calculation in Conditions of Variable Traffic Using the Markov Processes with Incomes**

Elena Ionikova

Siberian State University of Telecommunications and Informatics

*Viatcheslav P. Shuvalov, Irina G. Kvitkova, Elena P. Ionikova*

13. **Some Features of the Implementation of the Cognitive Radio Algorithm on the Board of the SDR Device Module**

Alexander Stenin

Siberian State University of Telecommunications and Information Science

*Alexander Stenin*

14. **Development of a Wireless Spirometer**

Aleksey Misyura

Novosibirsk State Technical University

*Aleksey S. Misyura, Anna S. Kazmina*

15. **The Effect of Reference Conductors on the Efficiency of Modal Decomposition in a Turn of a Broad-Side Coupled Meander Line**

Salim Karri

Tomsk State University of Control Systems and Radioelectronics

*Ivan Skornyakov, Roman Surovtsev, Salim Karri*

16. **Calculation of Reliability of Sensors and Detectors in Intelligent System of Telecommunication Network Using Fuzzy Set Methods**

Alevtina Muradova

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Alevtina Muradova, Aybek Khaytbaev, Dilbar Normatova*

17. **A Differential Method for Classifying Ground-Level Obstacles and Its Implementation in a Navigation Aid for the Blind**

Yaroslav Strekovczov

Novosibirsk State Technical University

*Andrey Nikulin, Yaroslav Strekovczov, Anna Kazmina, Viktor Smirnov*

**18.** **Broadcasting Using the Decawave UWB Module**

Kirill Vetrov

Novosibirsk State Technical University

*Kirill Vetrov, Vitaliy Borsh, Andrey Nikulin*

THE SECOND DAY:
**1.** **Comparative Analysis of RSMA and SDMA under ZF and RZF Precoding**

Artyom Shinkevich

Tomsk State University of Control Systems and Radioelectronics

*Artyom Shinkevich, Dmitriy Pokamestov, Yakov Kryukov, Georgiy Shalin, Rudolf Litvinov, Eugeniy Rogozhnikov*

**2.** **Non-Linear Acoustics In Loudspeaker Design**

Maxim Shushnov

Siberian State University of Telecommunications and Information Science

*Maxim S. Shushnov, Tatiana V. Shushnova, Anna M. Onoprienko*

**3.** **Compact Design and Improved Suppression of Ultrashort Pulses in a Modal Filter on a Double-Sided Printed Circuit Board with Broadside and Edge Coupling**

Maria Samoylichenko

Tomsk State University of Control Systems and Radioelectronics

*Maria A. Samoylichenko*

4. **Analysis of the Effect of Dielectric Substrate Material on the Performance of Multiconductor Stripline Protection Devices**

Alexander Lakoza

Tomsk State University of Control Systems and Radioelectronics

*Valerii Kosteletskii, Alexander Lakoza*

5. **Probabilistic Characteristics of Angular Errors in Positioning a Point Object Caused by Signal Reflections in an Ahechoic Chamber**

Alexey Kiselev

Novosibirsk State Technical University

*Alexey Kiselev, Alexey Fateev, Roman Zakhvatikhata*

6. **Angular-Domain Power Distribution Control for BPSK/QPSK MIMO Radars**

Yury Meleshin

National Research University of Electronic Technology - MIET

*Yury M. Meleshin*

7. **Neural Network Methods for Monitoring the Lower Ionosphere Using VLF Signal Data**

Khac Hoang Duong Nguyen

Irkutsk National Research Technical University

*Nguyen Khac Hoang Duong, Aleksandr S. Poletaev*

8. **Mathematical Model of the Express-RV Satellite System Return Link Radio Channel**

Vyacheslav Zharinov

Tomsk State University

*Vyacheslav Zharinov*

9. **Performance Analysis of Satellite-based Augmentation System in Global Navigation Satellite System Signal Simulators**

Dmitry Pogulyaev

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

*Dmitry Pogulyaev, Vladimir Pukhov, Svyatoslav Burtsev, Dmitry Pecheritsa*

10. **Development of a Navigation Signals Simulator Accounting for Signal Generators Degradation in Navigation Spacecrafts**

Artyom Maltsev

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

*Artyom S. Maltsev, Elizabetta G. Uyutnova, Svyatoslav Yu. Burtsev, Dmitry S. Pecheritsa*

11. **Research and Analysis of Transient Processes of Formation of Pseudo-Random Sequence of FDMA GLONASS Signals**

Elizabetta Uyutnova

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

*Elizabetta G. Uyutnova, Svyatoslav Yu. Burtsev, Aleksey S. Zavgorodnii, Dmitry S. Pecheritsa, Artem S. Maltsev, Hristofor Ph. Grill*

12. **Antenna Curtain for Active Phased Arrays**

Aleksey Nesterenko

Tomsk State University of Control Systems and Radioelectronics

*Nikita Shatalov, Aleksey Nesterenko, Valerii Kosteletskii*

# Section: Automation and Information-measuring Technologies

November 14, 14:00-19:15, Hall ASSAMBLEYA, SAMMIT 2
November 15, 10:00-16:00, Hall ASSAMBLEYA

Section Chairs: Maxim Bakaev, Sergey Alekseitsev

THE FIRST DAY (Hall ASSAMBLEYA):

1. **Neural Network Technology in Classification of Objects of Critical Information Infrastructure**

Anton Kiselev

Novosibirsk State Technical University

*Anton Kiselev, Victor Belov, Natalia Voronina*

2. **Automatic Recognition of Historical Documents of the Beginning of the 20th Century in Russian**

Stepan Gudkov

Institute of Computational Mathematics and Mathematical Geophysics of Siberian Branch of Russian Academy of Sciences

*Vladimir Barakhnin, Stepan Gudkov*

3. **Discount Eye-Tracking for Usability Testing 2.0: Multimodal CNN with Geometric Features**

Ivan Kolidov

Novosibirsk State Technical University

*Ivan A. Kolidov, Maxim Bakaev*

4. **Protected Version of Knowledge Base for Training Artificial Intelligence in Anti-Corruption Expertise**

Dmitry Kosov

Novosibirsk State Technical University

*Viktor M. Belov, Dmitry L. Kosov, Zakhar S. Tkachev*

5. **Assessment of Amharic-English Literary Translations Quality by Ryabko-Savina Method**

Yeshewas Lulu

Novosibirsk State University

*Yeshewas Getachew Lulu*

6. **Improving the Accuracy of Rock Fragmentation Assessment Using Synthetic Images**

Kirill Reshetnikov

Ural Federal University

*Kirill Reshetnikov, Mikhail Ronkin*

7. **Using Machine Learning Methods to Model and Interpret Problems in Determining the Parameters of the Medium Near the Well Using Signals from a High-Frequency Induction Logging While Drilling Device**

Rofikul Al Masud

Novosibirsk National Research State University

*Alexander Vlasov, Rofikul Al Masud, Galina Bykova*

8. **Siamese Neural Network for Few-Shot Visual Inspection of Steel Surface Defects in Predictive Maintenance Systems**

Vitalii Zaozernov

Novosibirsk State Technical University

*Egor Antonyants, Anna Aletdinova, Vitalii Zaozernov, Alexander Leontiev, Anton Vasiliev*

9.  **Development of an Obstacle Detection Module for the Adaptive Cruise Control System**

Vyacheslav Sharpanov

Peter the Great St. Petersburg Polytechnic University

*Viacheslav Sharpanov, Dmitry Budanov*

10. **Intelligent Information-Measuring System for Predictive Management of Urban Labor Resources Based on Neural Networks**

Olga Ergunova

Higher School of Industrial Management, Peter the Great St. Petersburg Polytechnic University

*Irina Karabulatova, Olga Ergunova, Andrey Somov*

11. **A Neuro-Symbolic, Multi-Modal Architecture for Advancing Adaptive Intelligent Tutoring Systems**

Khusniddin Ruzimboev

Mamun University, Urgench State University named after Abu Rayhan Biruni

*Khusniddin Ruzimboev, Ikhtiyor Avezmatov, Abdulaziz Kho'jamqulov*

12. **Deep Reinforcement Learning-Based Calibration Optimization for Robotic Manipulators Under Dynamic Uncertainties**

Abdugofur Rakhimov

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Rakhimov Abdugofur, Khaytbaev Aybek, Madaminov Khaydar, Abdujapparova Muborak*

13. **Hybrid Neural Network and Gradient Boosting Approach for Air Pollution Level Classification**

Andrey Semenov

National University of Oil and Gas «Gubkin University»

*Andrey S. Semenov, Anna A. Aletdinova*

14. **Information-Measuring Approach to Multimodal Educational Content Quality via Neuro-Symbolic AI**

Khusniddin Ruzimboev

Mamun University, Urgench State University named after Abu Rayhan Biruni

*Khusniddin Ruzimboev, Ikhtiyor Avezmatov, Abdulaziz Kho'jamqulov, Sobirov Asadbek*

15. **Application of Artificial Intelligence Technologies for Efficient Resource Management and Reserve Force Planning in Emergency Situations**

Noila Matyakubova

Alfraganus University

*Adilbek Dauletov, Dauletmurat Jaksimov, Noila Matyakubova*

16. **Situational Management and Multi-Agent Self Learning Systems for SpaceFibre Network Resources Real-Time Allocation**

Elena Suvorova

Saint-Petersburg State University of Aerospace Instrumentation

*Suvorova Elena, Polyakov Vadim*

**17. Analysis of the Impact of Attacks Against Machine Learning Components of Intrusion Detection Systems**

Egor Ichetovkin

Laboratory of Computer Security Problems St. Petersburg Federal Research Center of the Russian Academy of Sciences (SPC RAS)

*Egor Ichetovkin, Igor Kotenko*

**18. Algorithms for Recognition in Marker-Based and Spatial Augmented Reality**

Eldor Sayfiev

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Muazzam Artikova, Eldor Sayfiev*

**19. Wavefront-based Pathfinding Algorithm for Static and Dynamic Environments**

Mikhail Rolnov

MIREA - Russian technological university

*Mikhail Rolnov, Alexander Bychkov*

THE FIRST DAY (Hall SAMMIT 2):

**1. Using of Chernov Face Diagrams to Identify Incorrect Results of Experimental Research**

Andrew Goonko

Novosibirsk State Technical University

*Andrew V. Goonko, Yakov S. Kutovenko, Gennady V. Seroklinov*

**2. 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

*Evgeny A. Putyata*

**3. Hybrid Post-Quantum Cryptographic Framework for High-Performance Secure Data Transmission**

Temur Turdiyev

Urgench State University named after
Abu Raykhan Beruni

*Timur Khudaybergenov, Temur Khudayberganov,
Temur Turdiyev, Bahrombek Sabirov*

**4. Epitrochoids in Goniometry and the Possibility of their Experimental Diagnostics**

Alexey Kiryanov

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

*Alexey Kiryanov, Valeriy Kiryanov*

**5. Research of the Force Loading Channel Gain from the Operating Mode of the Strength Test Bench**

Maksim Trubin

Novosibirsk State Technical University

*Maksim V. Trubin, Valery D. Yurkevich*

6. **Application-Specific Optimization of Hybrid Post-Quantum Cryptographic Frameworks in Resource-Constrained Environments**

Temur Turdiyev

Urgench State University named after Abu Raykhan Beruni

*Timur Khudaybergenov, Temur Khudayberganov, Bahrombek Sabirov, Temur Turdiyev*

7. **Post-Quantum Secure Digital Signature Scheme Based on Non-Commutative Matrix Algebra**

Alisher Mavlonov

Limited liability company Unicon.uz

*Gayrat Juraev, Alisher Mavlonov, Sokhibjan Muminov, Sanatjon Jafarov*

8. **Development of Methods and Means for Chicken Sex Determining Experiments Automation**

Sophia Semenova

Novosibirsk State Technical University

*Irina Yakovina, Aleksandr Aleinikov, Sofiya Semenova, Anna Pronyushkina, Ivan Osipenko*

9. **Automation of SIEM Correlation Rules Based on Mapping and LLM**

Andrey Chechulin

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

*Maxim Malakhov, Lidia Vitkova, Igor Kotenko, Andrey Chechulin*

10. **Recognition of Ripe Tomatoes Based on RGB Signals**

Periuza Pirniyazova

Almaty Technological University

*Periuza Pirniazova, Gulzat Ziyatbekova, Polatova Zhansaya, Madina Sydykovaline, Aidarkul Moldir, Bota Issimsartova*

11. **An Analysis of Air Turbulence Zones From the Perspective of Drone Inspection**

Ntmitrii Gyrichidi

MIREA - Russian Technological University

*Ntmitrii Gyrichidi, Stanislav A. Eroshenko, Alexey M. Romanov*

12. **A Universal Approach for Measuring Signal Frequency from the Amplitude Spectrum Using Various Window Functions to Mitigate Spectral Leakage Effects**

Andrey Serov

National Research University "Moscow Power Engineering Institute"

*Sergey A. Podobuev, Darya S. Yevtekhova, Elizaveta V. Koniushenko, Alexander A. Shatokhin, Nikolay A. Serov, Andrey N. Serov*

13. **Advanced Route Planning for Effective Data Acquisition in Distributed Sensor Networks for Environmental Monitoring**

Tulkin Matkurbanov

Urgench State University named after Abu Rayhan Biruni

*Tulkin Matkurbanov, Alisher Khayrullaev, Tulkin Delov*

14. **Peculiarities of Construction of Telemetric System for Controlling the State of Objects**

Andrey Bodin

National Research University "MEI"

*Kristina D. Mishina, Oksana E. Bezborodova, Oleg N. Bodin, Dmitry V. Martinov, Andrey Yu. Bodin, Mikhail N. Kramm*

15. **Study On The Implementation Of Reliable Data Transmission In Wireless Communication System**

Artyom Ruzmetov

Urgench RANCH University of Technology

*Artem Ruzmetov, Timur Khudaybergenov*

16. **The Control System for Coriolis Mass Flowmeter under Two-Phase Flow. The Simulation Results**



Dmitry Goncharov

South Ural State University

*Dmitry Goncharov, Ivan Fedosov, Semen Koptyaev, Alexey Nezhurbida*

17. **Application of Time Series Forecasting Methods to Test Random Number Generators**



Anton Agalakov

Siberian State University of Telecommunication and Information Science

*Ulyana Osipova, Anton Rakitsky, Anton Agalakov*

18. **Prevention of Attacks Using QR Codes Based on Cryptographic Approaches and Machine Learning Methods**



Shohida Yusupova

Urgench State University named after Abu Rayhan Biruni

*Shohida Yusupova, Otabek Khujaev, Ogabek Matyaqubov*

19. **Automatic Reserve Activation System Using Technical Condition Assessment of Operating Equipment**



Arthur Astakhov

Peter the Great St. Petersburg Polytechnic University

*Arthur Astakhov, Lyudmila Chernenkaya*

THE SECOND DAY (Hall ASSAMBLEYA):

1. **Registration of Off-Axis Holographic Interferograms Using High-Resolution Photodetector Arrays**

Vladimir Guzhov

Novosibirsk State Technical University

*Vladimir I. Guzhov, Sergey P. Ilinykh, Dmitry S. Khaidukov*

2. **Monitoring the UAV Flight Altitude Along Railways Using Computer Vision**

Artem Lebedev

Novosibirsk Branch of the Rzhanov Institute Of Semiconductor Physics SB RAS "TDIAM"

*Artem Lebedev, Vitaliy Vasilev, Boris Novgorodov, Andrey Paulish*

3. **Determination of the Most Probable Locations For Conducting Instrumental Observations of Thunderstorm Events That Cause Forest Fires in the Altai Republic**

Varvara Safonova

Gorno-Altaisk State University

*Nikolay Kudryavtsev, Varvara Safonova, Ivan Frolov. Dmitry Kudin*

4. **Integration of Drone Systems in the Construction Industry: Applications**

Merdan Turan

Alanya Alaaddin Keykubat University

*Merdan Törehan Turan*

5. **Design of Anisotropic Potentials and their Application to UAV Swarm Control**

Pavel Chertovskikh

Moscow Institute of Physics and Technology

*Pavel A. Chertovskikh, Alexey A. Druzhinin, Andrey M. Boiko*

6. **Recent Advances in 3D Optical Microsurface Profiling**

Sergey Tyryshkin

Polzunov Altai State Technical University

*Sergey Tyryshkin*

7. **Study of GNSS Pseudorange Residual Error Mitigation Model Applicability Limits**

Vladislav Zhilinskiy

Federal State Unitary Enterprise "National Research Institute of Physicotechnical and Radio Engineering Measurements"

*Vladislav Zhilinskiy*

8. **Advanced Measurement Systems for ADC/DAC Characterization: Methodology, Hardware and Local Dose-Enhancement Effects**

Roman Torshin

National Research Nuclear University MEPhI

*Roman Torshin*

9. **On the Question of Anisotropy of Precision Goniometer Metrological Indicators**

Valeriy Kiryanov

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

*Alexey V. Kiryanov, Valeriy P. Kiryanov*

10. **"Adaptive Thresholding" Method to Select Prominent Objects by Converting the Image to Black and White Format**

Ural Raimkulov

Tashkent University of information
technologies

*Ural Raimkulov*

11. **Refrigerant Leak Detection in Data Centers Using Topologically Determined Graph Neural Networks**

Mikhail Ronkin

Ural Federal University

*Sergey Ivanov, Vasilii Borisov, Saraa Ali,
Mikhail Hushchyn, Yury Chernyshov, Mikhail Ronkin*

12. **Features of the Complex Application of Cross- and Autocalibration Procedures in Certification of Embedded Type Angle Encoders**

Alexey Kiryanov

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

*Alexey V. Kiryanov, Valeriy P. Kiryanov*

13. **Development and Validation of Soil Temperature Model for Precision Agriculture Using Machine Learning and Heterogeneous Data**



Mikhail Yuzhakov

Tomsk State University

*Mikhail Yuzhakov, Artem Berzin, Alexander Badin, Ilya Speshilov, Vladislav Kazanin, Serafim Sitnikov*

14. **Experimental Validation of a Method for Downward Continuation of Space-Based Gravitational Field Measurements Using a Ground-Based Gravimetric Test Site**

Ruslan Davlatov

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

*Ruslan Davlatov*

15. **Development Of A Cloud Portal For Process-Oriented Programming Toolkits**

Yegor Kuznetsov

Cyber-Physical Systems lab Institute of Automation and Electrometry

*Igor Epov, Yegor Kuznetsov, Vladimir Zyubin*

16. **Development of Test Bench Software for Studying the "Peshekhod" Gravimeter Using the Tilting Method**

Viktoria Kazarina

Russian Metrological Institute of Technical Physics and Radio Engineering

*Viktoria Igorevna Kazarina, Ruslan Askardzhonovich Davlatov*

17. **Computational Algorithm for Alculating a Formal Quality Criterion for Stratigraphic Correlation of Wells**

Vasilisa Sheludko

Novosibirsk State Technical University

*Lapkovsky Vladimir Valentinovich, Ilyinykh Sergey Petrovich, Sheludko Vasilisa Ivanovna*

18. **Evaluating Readability and Accessibility of Code Generated by Large Language Models**

Yaroslav Zakharov

Novosibirsk State Technical University

*Yaroslav Zakharov, Maxim Bakaev*

19. **Development of a Software Function Library for Signal Processing of Measuring Devices Using Graph-Based Modeling**

Aleksandr Kovalchuk

Novosibirsk State Technical University

*Aleksandr Kovalchuk, Dmitry Laptev*

20. **Comparative Modeling of Configuration Control Algorithms for a Group of Mobile Robots**

Michael Mashkov

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

*Michael Mashkov, Konstantin Kotov*

# Section: Mathematical Modeling of Processes and Systems

November 15, 9:00-16:00, Hall FORUM1

Section Chairs: Boris Lemeshko, Marina Persova, Petr Domnikov

1. **An Approach to 3D Inversion of Semi-Airborne Time-Domain Electromagnetic Data**

Anastasia Sivenkova

Novosibirsk State Technical University

*Marina Persova, Denis Vagin, Yury Soloveichik, Yulia Koshkina, Anastasia Sivenkova, Marina Tokareva*

2. **3D Modeling of Electromagnetic Heating Technology in the Development of Heavy Oil Reservoirs**

Daryana Leonovich

Novosibirsk State Technical University

*Marina Persova, Yury Soloveichik, Daryana Leonovich, Denis Vagin, Konstantin Vinogradov, Maxim Romanov*

3. **Modelling the Effective Elastic Properties of Hydrate-Bearing Rocks: a Comparison of Static and Dynamic Approaches**

Anastasiia Kutishcheva

Trofimuk Institute of Petroleum Geology and Geophysics of Siberian Branch Russian Academy of Sciences

*Anastasiia Yu. Kutishcheva*

4. **An Adaptive Workflow for Segmentation and Mesh Generation for Complex Multiphase Micro-CT Images of Hydrate-Bearing Rock Samples**

Daria Dobrolyubova

Trofimuk Institute of Petroleum Geology and Geophysics of Siberian Branch Russian Academy of Sciences (IPGG SB RAS)

*Mikhail I. Fokin, Daria V. Dobrolubova*

5. **Mathematical Modeling of the Influence of Random Disturbances of the External Environment on Heat Exchange Processes**

Sergey Gusev

Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Novosibirsk State Technical University

*Sergey Gusev*

6. **Mathematical Model of the Process of Gas Displacement in Multilayer Systems**

Shikhnazar Ismailov

Tashkent University of Information Technologies Named after Muhammad Al-Khwarizmi

*Normakhmad Ravshanov, Shikhnazar Ismailov, Mohiniso Mahmudova*

7. **High-Performance Matrix Multiplication Using Block Parallelization on CPU and GPU**

Shakhzod Javliev

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Mekhriddin Rakhimov, Mannon Ochilov, Shakhzod Javliev*

8. **Parallel Frame-Based Signal Filtering on Shared-Memory Multi-Core CPU Using OpenMP**



Shakhzod Javliev

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Mekhriddin Rakhimov, Shakhzod Javliev, Sokhibjon Botirov, Makhliyo Turaeva, Ulugbek Turdiev*

9. **Comparative Analysis of Different Models for Electron Optics Problems**

Valentin Ivanov

Budker Institute of Nuclear Physics

*Valentin Ivanov*

10. **Development of a Mathematical Model for Intelligent Monitoring of Industrial Power Transformer**

Georgiy Katalitskiy

Novosibirsk State Technical University

*Irina Yakovina, Alexander Dvortsevoy, Sergey Korobeynikov, Georgiy Kataliskiy, Olesya Borush, Vladimir Shevchenko*

11. **Determination of Optimal Drilling Parameters Using Fuzzy Tool Life Models**

Andrey Kriveckiy

Novosibirsk State Technical University

*Alexandr Popov, Vitaliy Karmanov, Andrey Kriveckiy*

12. **Classification of Neural Network Approaches to Restoring Damaged QR Codes**



Mardonbek Jumanazarov

Urgench State University named after Abu Rayhan Biruni

*Shohida Yusupova, Bekchanov Faxriddin, Jumanazarov Mardonbek*

13. **Numerical Modeling of Groundwater Filtration Taking into Account Seasonal Changes in a Two-Layer Medium**

Mokhiniso Makhmudova

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Elmira Nazirova, Mohiniso Mahmudova, Khurshida Karabaeva*

14. **The Qualitative Analysis of the Model of a Recurrent Oscillatory Neural Network (RONNs)**

Abrorjon Turgunov

Tashkent University of Information Technologies named after Muhammad al-Khwarizmi

*Mohiniso Hidirova, Abrorjon Turgunov, Marks Matyakubov*

15. **Application of an Integrated Approach Based on a Petrophysical Invariant and Rate Superposition for Well-Test Analysis in Low-Permeability Reservoirs**

David Shengeliya

Tyumen State University

*David Yu. Shengeliya, Irina G. Zakharova*

16. **Evaluation of Accuracy and Performance of Neural Network and Machine Learning Models for Flood Damage Prediction**

Kuan Madiyarov

Novosibirsk State University of Economics and Management

*Kuan Madiyarov, Andrey Pestunov*

17. **Multiscale Mathematical Modelling of Dissociation Process in Hydrate-Saturated Reservoirs**

Sergey Markov

The Trofimuk Institute of Petroleum Geology and Geophysics SB RAS, Novosibirsk State Technical University

*Sergey I. Markov, Ella P. Shurina, Natalya B. Itkina*

18. **Digital Twin for Predictive Anomaly Detection in Data Center Cooling Systems: A Modelica-Based Approach with Synthetic Data Generation**

Stanislav Poliakov

Ural Federal University

*Stanislav Polyakov, Vasilii Borisov, Mikhail Hushchyn, Yury Chernyshov, Alexander Manzhurov, Mikhail Ronkin*

19. **Development of a Program for Solving the Filtration Problem in Gas Fields Considering Pressure-Dependent Porosity**

Gulstan Artikbaeva

Khorezm Mamun academy

*Gulstan K. Artikbaeva, Shikhnazar.R. Ismailov, Markhabo Shukurova*

20. **Analysis of Aggregation Algorithms in Federated Learning for Non-Identically Distributed Data**

Yana Bekeneva

Saint Petersburg Electrotechnical University "LETI"

*Yana Bekeneva, Evgenia Novikova, Vasily Desnitsky*

21. **Neuromorphic Information-Measuring Systems for Intelligent Job Requirements Analysis in Smart City Infrastructure**

Olga Ergunova

Higher School of Industrial Management, Peter the Great St. Petersburg Polytechnic University

*Le Quang Minh, Olga Ergunova, Andrey Somov, Natalia Belyakova*

22. **Methods of Adaptive Signal Processing in Hybrid Network Communication**

Igor Boyko

The Bonch-Bruevich Saint Petersburg State University of Telecommunications

*Igor Boyko, Ilya Gorobtsov, Evgeniy Glushankov, Andrey Vladyko*

23. **Detection of Layer-like Conducting Objects Based on Electromagnetic Sensing Signals Using Threedimensional Mathematical Modeling**

Nadezhda Shtabel

Trofimuk Institute of Petroleum Geology and Geophysics of Siberian Branch Russian Academy of Sciences (IPGG SB RAS)

*Nadezhda V. Shtabel*

24. **Numerical Simulation of Heating and Drying of Granular Material in a Vortex Chamber**

Gennadiy Sivykh

Novosibirsk State Technical University

*Gennadiy F. Sivykh*

# Section: Optical and Laser Technologies

November 14, 14:00-18:15, Hall PANORAMA

Section Chairs: Alexander Dmitriev, Dmitry Zakrevsky

INVITED TALK:

### New Techniques for Intracavity Shaping and Control of Laser Pulses in Fiber and Fiber-Semiconductor Sources

Boris Nyushkov

Novosibirsk State Technical University

1. **Pulsed Operation of Rare-Earth-Doped Fiber Lasers with Negative Optical Feedback**

Maksim Radchenko

Novosibirsk State Technical University

*Boris Nyushkov, Maksim Radchenko, Igor Korel*

2. **Improving the Direct Image Analysis Method for Determining the Size of Microparticles by Dividing Particles Into Morphoclasses**

Lidiya Dmitrieva

Federal State Unitary Enterprise Russian National Scientific Research Institute of Physical, Technical and Radiotechnical Measurements

*Lidiya I. Dmitrieva, Alexey V. Levsky, Dmitry M. Balakhanov*

3. **Method for refining the Regional Model of the Arctic's Gravitational Parameters by Means of the Space Measurements**

Sergei Donchenko

All-Russian Scientific Research Institute of Physical-Technical and Radiotechnical Measurements»

*Vyacheslav F. Fateev, Sergey S. Donchenko, Ruslan A. Davlatov, Mihail O. Babenko*

4. **Modeling Young's Single-Photon Experiment Using Approximate Quantum-Mechanical and 1-Component Quasi-Classical Photon Wave Functions in Coordinate Representation for Spherically Symmetric Radiation**

Alexandr Davydov

Nosov Magnitogorsk State Technical University

*Alexandr P. Davydov, Tatiana P. Zlydneva, Alexandr D. Shablovskii*

5. **Time Evolution of Three-Photon Interference in Young's Experiment Scheme within Numerical Simulation of 6-Component Coordinate Wave Function of Directed Radiation**

Nikolai Faizrakhmanov

Nosov Magnitogorsk State Technical University

*Alexandr P. Davydov, Nikolai Faizrakhmanov*

6. **Application of Z-Stacking Technology in Non-Destructive Testing Systems for Integrated Circuit Fabrication**

Alexandr Golitsyn

Rzhanov Institute of Semiconductor Physics

*Alexandr Golitsyn, Andey Golitsyn, Natalia Seyfi*

7. **Temperature Dependence of Phase Delay of Reference Frequency Signal Transmitted through Optical Fiber**

Nickolai Golovin

Novosibirsk State Technical University

*Nickolay N. Golovin, Konstantin N. Savinov, Alexander K. Dmitriev, Andrey V. Krivetsky, Alexander S. Tolstikov, Vladislav D. Rachkov*

8. **Method for Measuring Gravitational Acceleration Using Tilted Fiber Bragg Grating Sensors**

Artem Mareev

Siberian State University of Geosystems and Technologies

*Artem V. Mareev, Valentin R. Yangalyshev, Alexander V. Makeev*

9. **Nonlinear Optical Properties of the Compositional Material of Single-wall Carbon Nanotubes and Nickel Phthalocyanine with a Cyclotriphosphazene Substituent**

Mikhail Savelyev

National Research University of Electronic Technology (MIET)

*Mikhail Savelyev, Pavel Vasilevsky, Ekaterina Otsupko, Alexander Tolbin, Alexander Gerasimenko*

10. **Modeling Visible Light Communication Channels for Reliable Data Transmission in Medical Monitoring Systems**

Nurzhan Smagzanov

D. Serikbayev East Kazakhstan technical university

*Svetlana Grigoryeva, Olga Shvets, Aslima Alimkhanova, Anar Bolatova, Smagzanov Nurzhan*

11. **Integrated Multichannel SS-OCT System Design Approach with an Array of Grating Couplers**

Ivan Stepanov

Ufa University of Science and Technology

*Ivan V. Stepanov, Vladimir S. Lyubopytov, Vladislav V. Ivanov, Elizaveta P. Topolskaya*

# Section: Natural Language Processing

November 14, 14:00-20:00, VIRTUAL HALL 1

Section Chairs: Davlatyor Mengliev, Nilufar Abdurakhmonova

1. **Bridging Legal and Medical Texts Through a Dual-Pipeline Classification Approach in Karakalpak Texts**

   Davlatyor Mengliev

   Cyber University

   *Davlatyor Mengliev, Shakhnoza Nashirova, Umida Khudaybergenova, Nina Rogozinnikova, Rashid Zohidov, Guzal Rakhimova*

2. **Detecting Allusions in the Karakalpak Language Using mBERT**

   Davlatyor Mengliev

   Cyber University

   *Davlatyor Mengliev, Raima Shirinova, Temur Khudayberganov, Shaxnoza Abdukayumova, Xilola Yunusova, Intizor Djumaniyazova*

3. **Sentiment Mining of Patient Experience Data Using T5 Architectures**

   Nilufar Abdurakhmonova

   National University of Uzbekistan named after Mirzo Ulugbek

   *Nilufar Abdurakhmonova, Abbos Begimov, Maftuna Hamroyeva, Elvina Aliyeva, Soliyajon Kurbanboyeva, Bahodir Ibragimov*

4. **Development of Hybrid Algorithm for Named Entity Recognition in Uzbek Public Administration Texts**

   Nilufar Abdurakhmonova

   National University of Uzbekistan named after Mirzo Ulugbek

   *Nilufar Abdurakhmonova, Nilufar Adizova, Dilnoza Jamolitdinova, Abbos Begimov, Aydin Sultanova, Gulkhayo Juraeva*

5. **Uzbek Public-Sector Text Classification: Naive Bayes, Logistic Regression and SVM Benchmarks**

Nilufar Adizova

Bukhara State University

*Nilufar Abdurakhmonova, Nilufar Adizova, Dilnoza Sabirova*

6. **Extracting Ecological Facts from Karakalpak Texts via Named Entity Recognition**

Nilufar Adizova

Bukhara State University

*Umidakhon Azimova, Gulbadanbegim Kasimova, Zina Kazbekova, Boburjon Shermatov, Elmurod Urinov, Nilufar Adizova*

7. **Document-Level Semantic Analysis of Uzbek Texts— Scheme, Benchmark, and Reproducible Results**

Saidbek Babayazov

Cyber University

*Saidbek Babayazov, Lola Samandarova, Mohira Matnazarova, Umidbek Babayazov, Khurshida Qodirova, Shukhrat Khudayberganov*

8. **Oghuz Dialect Analysis of the Uzbek Language: Methodological Approach and Experimental Study**

Saidbek Babayazov

Cyber University

*Saidbek Babayazov, Mukhriddin U. Eshkulov, Obidjan Madaminov, Umidbek Babayazov, Nafisa Ruzimova, Dilfuza Xajiyeva*

9. **Hybrid Approach to Genre Classification of Karakalpak Texts in Telecommunications and Energy Domains**

Nodirbek Boltayev

Urgench State University

*Davlatyor Mengliev, Guli Toirova, Rayhon Ergasheva, Khamidillo Atakhanov, Zulfiya Rustamova, Nodirbek Boltayev*

**10. Identification of Named Entities from Uzbek Historical Texts: A Multilingual BERT Approach**

Nodirbek Boltayev

Urgench State University

*Nodirbek Boltayev, Munisa Nayimova, Nodìrabegim Abubakirova, Alisher Abidjanov, Kamolova Madina, Sevara Berdimurotova*

**11. Machine Learning for Uzbek Language Syntactic Analysis: A Review and Comparative Experiment**

Adina Egamberganova

Cyber University

*Rano Sayfullayeva, Kasimova Ziyoda, Aziza Shamahmudova, Umidjon Kuziyev, Matluba Yakubova, Adina Egamberganova*

**12. Development and Evaluation of a Combined Model for Genre Classification of Uzbek Media Texts**

Adina Egamberganova

Cyber University

*Zoir Tohirov, Ilkhomjon Tukhtasinov, Anorkhon Akhmedova, Lobar Babajanova, Adina Egamberganova, Muzaffar Yakubov*

**13. Morphological Generators in Computer Linguodidactics: Analysis of Parallel Corpus Applications for Turkic Languages**

Mahliyo Eshmamatova

Denov Institute of Entrepreneurship and Pedagogy

*Mahliyo Eshmamatova*

**14. Development of Algorithm for Classification of Financial Texts in the Uzbek Language**

Nafisa Ganijanova

Urgench State University

*Nafisa Ganijanova, Mukhiddin Shakarov, Sadokat Nurmanova, Salomat Otamurodova, Minavar Tilavova, Jasur Isroilov*

15. **Named Entity Recognition in Uzbek Agriculture: Impact of Script Standardization Across Neural Networks Architectures**

Nafisa Ganijanova

Urgench State University

*Nafisa Ganijanova, Alisher Abidjanov, Aybibi Iskandarova, Normurod Rasulov, Dilfuza Ruzmatova, Uktamjon Bituraev*

16. **Interpretable Psycholinguistic Profiling of Uzbek Student Essays via a Minimal Lexicon**

Bahodir Ibragimov

Urgench State University

*Zamira Yusupova, Bahodir Ibragimov, Farangiz Tuxliyeva*

17. **Building a Sentence-Level Sentiment Classifier for Karakalpak: From Low-Resource Data to Emotion Trajectories**

Bahodir Ibragimov

Urgench State University

*Zamira Yusupova, Shukhrat Kayumov, Bahodir Ibragimov*

18. **Development of an Algorithm for Linguistic Analysis of the Uzbek Texts**

Bozorboy Islombekov

Cyber University

*Bozorboy Islombekov, Guli Toirova, Ruziboy Safarboyev, Boburjon Shermatov, Farida B. Solieva, Mokhira Saparova*

19. **Developing a Word Classification Algorithm for Turkic Languages with PoS Tagging**

Bozorboy Islombekov

Cyber University

*Bozorboy Islombekov, Boburjon Shermatov, Qodirova Guli, Aybibi Iskandarova, Khidirova Gulnora, Xudoyor Shonazarov*

20. **Development of a Domain-Specific Named Entity Recognition Model for Pedagogical and Valeological Uzbek Texts**

Sarbinaz Kazakbaeva

Cyber University

*Zamira Yusupova, Rayhon Sapaeva, Sarbinaz Kazakbaeva*

21. **Ontology-Guided Legal NER and Relation Extraction for Uzbek Statutes with a Juridical Knowledge Graph**

Sarbinaz Kazakbaeva

Cyber University

*Shaxnoza Abdullayeva, Afag Madadova, Nasima Abdullayeva, Khabibulla Madatov, Sarbinaz Kazakbaeva, Shoira Khabibullayeva*

22. **Generating Grade-Appropriate Text Method Based on Basis Words**

Surayyo Khajibaeva

Urgench State University named after Abu Rayhan Biruni

*Surayyo Khajibaeva, Dildora Askarova*

23. **A Morphology-Aware Neural Network Model for Uzbek Text Classification**

Ulugbek Salaev

Urgench State University named after Abu Rayhan Biruni

*Ulugbek I. Salaev, Gayrat R. Matlatipov*

24. **Grade-Level Classification of Uzbek Literary Texts Using Text Complexity Features (Grades 5-9)**

Sapura Sattarova

Urgench State University named after Abu Rayhan Biruni

*Sapura Sattarova*

# Section: V International Symposium on Knowledge-Ontology-Theory (KNOTH 2025)

November 15, 12:00-16:00, VIRTUAL HALL 2

Section Chairs: Dmitry Palchunov, Grigoriy Khazankin

1. **Ontological Modeling of Construction Codes for Automated Regulatory Document Analysis**

   Danil Zhdanov

   Far Eastern Federal University

   *Valeriya Gribova, Pomnikov Egor, Zhdanov Danil*

2. **Text Tree Edit Distance: A Language Model-Based Metric for Text Hierarchies**

   Fedor Sobolevsky

   Moscow Institute of Physics and Technology

   *Fedor Sobolevsky, Konstantin Vorontsov*

3. **Integration of Logical and Neural Network Methods for Creation of Digital Twins of Regulations**

   Alexander Yakobson

   Novosibirsk State University

   *Dmitry Palchunov, Ivan Nemtsev, Alexander Yakobson, Svetlana Shelkovnikova*

4. **An Intelligent Assistant for Working with Regulatory Documents Based on Ontological Modeling and RAG**

   Aleksandr Zaitsev

   Novosibirsk State University

   *Anastasiya Grekhova, Dmitry Palchunov, Alexander Shishkin, Alexander Zaitsev*

**5. Enriching the Ontology of Argumentation Based on Critical Questions**

Yury Zagorulko

A.P. Ershov Institute of Informatics Systems

*Elena Sidorova, Yury Zagorulko, Irina Kononenko, Daria Ilina, Maria Tinofeeva*

**6. On the Separability Problem of Quantum Systems**

Vladimir Kharchenko

Novosibirsk State University, Novosibirsk State Technical University

*Gulnara Yakhyaeva, Vladimir Kharchenko*

**7. Hint Based Query Optimization with LLM Agent and Plan Similarity**

Nikita Vasilenko

A.P. Ershov Institute of Informatics Systems

*Nikita Vasilenko, Alexander Demin, Vladimir Burlakov*

**8. Binary Snapshot Inference: Fast Discovery of Probabilistic Causal Relations in Ontologies**

Denis Gavrilin

Institute of Mathematics Economics and Computer Science of Irkutsk State University

*Denis Gavrilin*

**9. On Access Control to Ontologies**

Darya Gavrilina

Irkutsk State University

*Darya Gavrilina*

**10. Navigating a Collection of Handwritten Documents Using Entity Lists**

Nikita Lomov

HSE University

*Nikita Lomov, Elena Penskaya, Serafima Mankovskaya*

**11. Logical Environment for Intelligent Robot Control**

Evgenii Cherkashin

Matrosov Institute for System
Dynamics and Control Theory
SB RAS

*Evgenii Cherkashin, Nadezhda Nagul, Artem Davydov,
Yingjie Wang, Haojun Teng*

**APEIE25**

Actual Problems
of Electronic Instrument
Engineering