

# PROGRAM

## 11th INTERNATIONAL CONFERENCE

«ENGINEERING & TELECOMMUNICATION – En&T-2024»

November 20-21, 2024

November 20, 2024

«PHIZTECH. CLUB». Shopping center Airship. 2nd floor

**10:00-11:00** Registration 1 floor

**11:00-11:20** Opening Ceremony

Welcome speech by *Prof. Sergey Garichev, Chairman of the Conference Organizing Committee, Director for Research and Development on Research, Laureate of the Russian Government Prize, MIPT Russia*

Welcome speech by *Prof. Alexander Dvorkovich, Chairman of the Conference Program Committee, Corresponding Member RAS, MIPT, Russia*

## Plenary Session

*Working language of the Plenary Session: English*

**Moderator: Prof. Alexander Dvorkovich, Corresponding Member RAS, MIPT, Russia**

**11:20-11:50**

A New Theory on Perceptual Lossy Compression for Audio Signals  
*Ilya Chizhov, Moscow Research Centre, Russia*

**11:50-12:20**

Challenges in Modern AI Models for Multimedia Data Processing  
*Sergey Buzykanov, MIPT, Russia*

**12:20-12:50**

Challenges of Modern Imaging Pipelines in Smartphones  
*Tchobanou Mikhail, Moscow Research Centre, Russia*

**12:50-13:20**

An Unifying Framework for Color Constancy: Bridging the Gap Between Low-Level Statistics Methods and Deep Learning Methods  
*Simone Bianco, Marco Buzzelli, Raimondo Schettini, University of Milano-Bicocca, Italy*

**13:20-13:50 Discussions**

**13:50-15:00 Break**

**15:00-18:00**

## Round-table «Freedom of choice: open and proprietary processor instruction systems»

*Working language of the Round Table: Russian*

**Moderator: Pavel Kryukov, Department of Advanced Computing Technologies, MIPT, Russia**

The rapid development of microelectronics and geopolitical risks are making open processor architectures increasingly attractive. The round table will discuss the prospects for using open and proprietary architectures in software and hardware systems. Industry experts, academic researchers and representatives from development companies will examine key factors influencing the choice of architecture for future computing systems, such as performance, security, licensing, development ecosystem and availability.

**Discussion points:**

1. Can the instruction set be a factor that determines the hardware performance of a processor?
2. How is the influence of the command system on the labor costs of implementation distributed between the software and hardware parts of the computing stack?
3. Free system software ecosystem: source of threats or source of opportunities?
4. Effective implementation strategy: targeted actions by the vendor or help from the community?
5. Controlling the Future: What are the trends in open and proprietary command systems? Are producers and consumers ready for the challenges of tomorrow?

**15:00-15:10**

Introduction in Topic for Discussion

*Pavel Kryukov, Department of Advanced Computing Technologies, MIPT, Russia*

**15:10-15:30**

How is the Influence of the Command System on Implementations Labor Costs Distributed Between the Software and Hardware Parts of the Computing Stack

*Maxim V. Maslov, Director of Special Projects Department, "Baikal Electronics", Russia*

**15:30-15:50**

Success Factors for the Open RISC-V Processor Architecture and Implementation Prospects

*Sergey I. Yakushkin, Head of Technology Committee, RISC-V Alliance, Russia*

**15:50-16:10**

Discussion time. **Brief summary.**

**16:10-16:30 Coffee break**

**16:30-16:50**

Impact of Instruction Set on Application Performance and Compiler Optimizations

*Sergey V. Maslov, Managing Director, Sber, Russia*

**16:50-17:10**

Experience with Various Processor Architectures at "Basalt SPO"

*Roman G. Stavtcev, Head of Projects Directorate, Basalt SPO, Russia*

**17:10-17:40**

Question Session and **Round-table summary**

**21 November 2024**

**Campus «FIZTECH. ARCTIC»**

**Conference Sections**

### **Session 1. Telecommunication systems and networks**

**10:00-15:00**

**Campus «FIZTECH. ARCTIC». Lecture hall 4th floor**

**Moderator: Prof. Alexander V. Dvorkovich, MIPT, Russia**

Multimedia service trials based on 5G NR MBS

*Liang Xiangjun, Pan Changyong, Zeng Qingjun*

HDR Vivid Automatic Testing Method for Multimedia output Device

*Ke Mao, Haidong Fang, Changyong Pan, Siyuan Li, Lu Tong, Xiafei Zhao*

Manipulating controlled FPGA component of Compain Screen and Streams

*Evgeny Ig. Khokhryakov*

Fast and Deterministic Method for Compressed Sensing Based Pilot Patterns Allocation

*Mikhail D. Fedorov*

A Method for Rapid Risk Assessment of a Computer Network with a Star-Shaped Topology

*Alexander A. Shiroky*

C-DL: Coordinated Direct Links for Serving VR Traffic in Wi-Fi 8 Networks

*Vyacheslav A. Loginov, Mary A. Mirzoian, Evgeny M. Khorov*

2D Generalization for a Method of Differential Orthogonal Matching Pursuit for MIMO Channel Estimation

*Vladimir Lyashev, Artem Solomkin*

A Robust Steganographic Model for Information Transmission in Images Using Deep Neural Networks

*Sergei A. Shustov*

Radio Simultaneous Localization and Mapping for Telecommunication Systems

*Nikita A. Alexandrov, Alexander S. Blagodarnyi*

Compensating for dynamic effects of nonlinear power amplifiers

*Nikita V. Bakholdin, Vladislav A. Chernienko, Sergei A. Bakhurin*

Wi-Fi based Gesture Recognition System

*Dai Tonghua, Evgeny M. Khorov*

Trends and features of Internet Speed in the Territory of the Russian Federation

*Pavel S. Izyumov, Alexander V. Ivchenko*

## **Session 2. Radio communication and radar systems**

**10:00-15:00**

**Campus «FIZTECH. ARCTIC». The classroom 3.10**

**Moderators: Prof. Sergey P. Skobelev, PJSC «Radiophysics», Russia  
Prof. Vladimir E. Farber, PJSC «Radiophysics», Russia**

Advanced nanomaterials for radioengineering and electronics

*Elena R. Pavlyukova, Alexey F. Belyanin, Yury V. Gulyaev*

Radiating Elements for 5G MIMO Antenna Systems: Single Element and Array Configurations

*Natanil M. Nazarov*

Ultra Range Common Phase Antenna Array

*Nguyen The Thanh, Vadim A. Kaloshin, Maria D. Dublenkova*

Analysis and Optimization of a Mirror-Lens Aplanatic Antenna

*Trinh Van Tuan, Vadim A. Kaloshin, Alexander S. Venhetsky*

Study of Mikaelian Perforated Lens

*Vadim A. Kaloshin, Bui Van Chung*

Simulation of Reentry Detection by Estimated Atmospheric Component

*Mariya A. Murzova, Vladimir E. Farber, Boris A. Levitan, Sergey A. Topchiev*

Fast and Effective Satellites Selection Algorithm for Multi-Constellation GNSS Receiver Based on Incremental Greedy Approach

*Raafat Ali*

Research and Development of an Algorithm for Automatic Link Establishment in the Shortwave Range

*Iaroslav D. Prasolov, Ivan A. Grigoryev*

Spatial Distribution of Error Probability Per Bit in a Wireless Ultra-Broadband Network with Cooperative and Non-Cooperative Node Operation Modes

*Aleksandr S. Zubkov, Lev V. Kuzmin, Elena V. Eoremova*

Construction of stable feedback for a molecular electronic sensor with low damping

*Vadim M. Agafonov, Ivan V. Gorchakov, Yaroslav A. Gordeev, Andrey L. Ronzhin*

Comparative analysis of NB-IoT and LoRa/LoRaWAN technologies and protocols for use in a satellite IoT system

*Valentin R. Anpilogov, Ch. V. Knong*

Virtual Personal Doppler-free Channel for 5G LEO Non-Terrestrial Networks

*Yuri V. Andreyev, Grigory M. Seregin, Grafodatskij O. S, Anton A. Khudykin,*

*Aleksandr A. Afonin*

Efficient Hybrid Radar System for Small Drone Detection: Integrating Multi-Frequency Polarimetric MIMO and Adaptive Micro-Doppler

*Himanshu Rai, Jyoti Kesharwani*

### **Session 3. Computing systems and intelligent data processing**

**10:00-15:00**

**Campus «FIZTECH. ARCTIC». The classroom 4.18a**

**Moderator: prof. Roman V. Meshcheryakov, ISC RAS, Russia**

A Formal Verification-Based Risk Assessment Framework for the Authentication of Self-driving Vehicles

*Saeed Muhammad Salman, Sergey Bezzateev*

Optimized VRF-Driven Distributed Randomness Generation Protocol

*Ivan S. Velichko, Sergey V. Bezzateev, Alexandra V. Afanasyeva*

Visual Localization system for GPS-Blind Environments in Unmanned Aerial Vehicles

*Murhij Yazan*

Determining the search region in the next observation session of a newly discovered space object

*Elena A. Kolessa*

IoT System Architecture for a Smart City

*Nahar Priyanka, Ghuraiya Avdhesh, Iliya M. Voronkov, Alexander A. Kharlamov*

Studying Deep Learning Metrics for the Problem of Person's Emotional State Recognition from Speech

*Konstantin D. Rusakov, Mark V. Mamchenko*

Inverse Weight Based Arbitration Algorithm for On-Chip Networks

*Yuri A. Nedbailo*

Evaluation of the Performance of a Multiphase Queuing System with Retrial Orbit Using Neural Network Model

*Dang Minh Cong*

Applicability of Shannon's Theorem to the Processing of Weakly Structured Speech Information in Acoustic Noise Conditions

*Alexander V. Dushkin, Roman V. Meshcheryakov*

An Improved Algorithm for Embedding Watermarks into Spatial-Frequency Domain of Images

*Anna S. Melman, Olesya E. Senyukova, Oleg O. Evsutin*

Study of Binary Function Layout Optimizations for Client Applications

*Dmitriy A. Kolobaev, Sergey A. Lisitsyn, Ludmila V. Stemporzhechkaya*

Compensation of dynamic effects for nonlinear power amplifiers

*Alexander A. Degtyarev, Nikita V. Bakholdin, Anton M. Sushko, Sergei A. Bakhurin*

A Toolkit for Profiling and Call Graph Analysis for RISC Architectures Based on Execution Traces

***Anton A. Shurygin, Alexander A. Dolgov, Igor V. Petushkov***

Organization of Uefi Firmware Configuration Variables Storage in The Binary Translator x86->e2k  
***Ekaterina V. Khudiakova, Alexander F. Rozhin***

Evolutionary Optimization for Autonomous Control in Robotic Systems: Integration of PID Controllers, Reinforcement Learning, and Evolutionary Algorithm  
***Pavel V. Garcia***

Development of a Predictive Analytics System in Industry Based on Hybrid Digital Models  
***Ivan S. Grudev***

Virtual inductance sensor in a synchronous three-phase electric machine  
***O. I. Urzhumtsev Dmitry A. Kanurin, S. Yu. Utkin, A. M. Tishin***

Method for determining the position of a communication line pole using UAVs  
***Mikhail I. Zaikin, Anton I. Saveliev, Marina A. Astapova***