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7th International Conference
«**Engineering and Telecommunication —
En&T-2020**»

In the context of the coronavirus pandemic,
the conference is held online

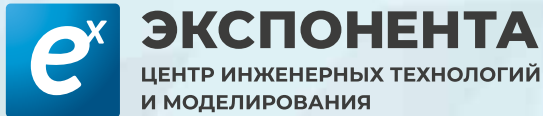
PROGRAM
November 25–26, 2020

Moscow
MIPT
2020

Organizers



Sponsors



NOVEMBER 25, 2020

9:30-10:00

To register as a participant, use the [link](#)

10:00-10:20

Opening Ceremony. Welcome speech by Prof. Sergey Garichev, Chairman of the Conference Organizing Committee, Vice-Rector of MIPT on Research and Developments, Laureate of the Russian Government Prize, Russia

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

Welcome speech by Evgeny A. Belyanko, Director School of Radio Engineering and Computer Technology, MIPT, Russia

Plenary Session

Moderator: Prof. Alexander Dvorkovich, MIPT, Russia

10:20-10:50

Selection Strategy for Data Collection and Control Technology for Industrial IoT Systems
Leonid V. Karpenko, Ph.D., General Director of «Synergy Team», Russia
Sergey V. Dushin, Ph.D., IPU RAS, Russia
Mikhail V. Gubko, professor, IPU RAS, Russia

10:50-11:20

Digital Processing Systems: Choosing a Processor/Platform
Ph.D. Scott Tancock, University of Bristol, United Kingdom
Dr. Naim Dahnoun, Higher Education Academy, Programme Director of the Computer Science and Electronic Programme at the School of Computer Science, Electrical and Electronic Engineering, Engineering Maths University of Bristol, United Kingdom

11:20-11:50

Artificial Intelligence and its Scope for Natural Language Processing in Compressed Document Images
Prof. P. Nagabhushan, University of Mysore, Indian Institute of Information Technology, India

11:50-12:20

IP-core of the Accelerator of Tensor Calculations Based on the Systolic Array
Pavel N. Osipenko, Deputy Technical Director for Microprocessors of LLC «IVA Technologies», Russia

12:20-12:50

Promising Technologies for Upgrading Wireless Networks Performance
Dr. Neetesh Purohit, Associate Professor at Indian Institute of Information Technology, India

12:50-13:00

RF-supercomputer - SDR HIL System
Alexander O. Boldyrev, Deputy General Director for Education and Science «National Instruments», Russia

13:00-14:00 Break

9:30-19:00

NOVEMBER 25, 2020

NOVEMBER 25, 2020

14:00-19:00

Round-table «Satellite infocommunication systems: trends and prospects»

Moderators: Oleg S. Grafodatsky, professor, Dr.Tech.Sc., CEO's counselor,
JSC Academician M.F. Reshetnev Information Satellite Systems, Russia

The purpose of the round table is giving an objective view of the prospects for the development of broadband access based on low-orbit multi-satellite systems. An objective analysis of satellite broadband projects for the Arctic and the NSR will be presented, and the main scientific and technical problems will be identified, on whose decisions successful implementation depends. An objective assessment of the relevance of the satellite IoT and the conditions for the competitiveness of IoT services will be presented.

Round table language is English.

14:00-14:10

Welcoming remarks

Purpose and order of discussion

Sergey N. Garichev, Dr.Tech.Sc., MIPT, Russia

LEO satellite broadband access systems

14:15-14:30 Report

14:30-14:50 Questions

Overview of the development of projects of low-orbit space systems of broadband access
Yuri M. Urlichich, Dr.Tech.Sc., Professor State Corporation «Roscosmos», Russia

Satellite broadband access in the Arctic zone, options for solving the problem

15:00-15:15 Report

15:15-15:40 Questions

Broadband access system based on highly elliptical satellites «Express RV»
Evgeny V.Buidinov, PhD, FSUE «Russian Satellite Communications Company», Russia

15:50-16:05 Report

16:05-16:20 Questions

Broadband access system based on high-altitude platforms and inclined geostationary satellites
Andrey A. Gritsenko, PhD, Information Space Center «Severnaya Corona», Russia

16:20-16:40 Break

LEO satellite broadband access systems

16:40-16:55 Report

16:55-17:10 Questions

Review of the development of projects of low-orbit space systems of broadband access
Yu Zhang PhD, Associate Professor, Dept. of Electronic Engineering, Tsinghua University, Beijing, China

14:30-20:00

NOVEMBER 20, 2019

Satellite Internet of Things

17:10–17:25 Report

17:25–17:40 Questions

Multi-satellite system of the Internet of things «IoT Marathon», conditions for the competitiveness of services

Valentin R. Anpilogov, PhD, Assistant Professor, JSC «VISAT-TEL», Russia

Nguyen Duc Anh, PhD student, MIPT, Vietnam

17:40–17:55 Report

17:55–18:10 Questions

System «Marathon IoT». A new direction of development of the space industry

Alexander V. Kuzovkin, PhD, JSC «ISS», Russia

Nikolay Testoedov, Corr. member RAS, JSC «ISS», Russia

Oleg Grafodatsky, Dr.Tech.Sc., JSC «ISS», Russia

18:10-18:45

Discussions

- Low-orbit satellite broadband systems, is it bankruptcy of technologies or companies?
- An urgency of creating satellite broadband access systems for the Arctic and SPM, is commercialization possible?
- Satellite Internet of Things, which segments and services are most relevant, is synergy with terrestrial networks possible?
- What areas and technologies in satellite communications require support from the state and state development funds?

18:45 – 19:00

**Keynote Oleg S. Grafodatsky, professor, Dr.Tech.Sc., CEO's counselor,
JSC Academician M.F. Reshetnev Information Satellite Systems, Russia**

Summarizing

What are the tasks in the field of promising satellite communication technologies that MIPT and Russian universities are capable of?

NOVEMBER 26, 2020

9:30-10.00

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10:00-19:00

13:00-14:00

Break

Session 1. Telecommunication technologies and networks

Moderators: Prof. Alexander V. Dvorkovich, MIPT, Russia
Prof. Jian Song, Tsinghua University, China

DAN Optimized Deep Learning Framework for Network Intrusion Detection System (NIDS)
Chaurasiya Vijay Kumar, Yadav Suneel, Sunakshi Singh, Ayonya Prabhakaran

On Improving the Simplex Coding in the Distributed Raman Fiberwire Sensors
Naran S.Khokshanov

Optimization of Partial Transmit Sequences Scheme for Peak-to-Average Power Ratio Reduction of OFDM Signals
Kien Vu Van, Nghia Tran Van, Cuong Nguyen Tang, Hieu Dang Trung

Chimera States in a Hyperconnected World
Viliam K. Sarian, Roman V. Meshcheryakov

A Hybrid Security Solution for Mitigating Cyber Attacks in Infocommunication Systems
Nik Ain Koupaei Alireza, Alexey N. Nazarov

Adaptive Digital Predistortion of RF Power Amplifiers Based on Memory Polynomial Model and Indirect Learning Architecture
Kien Vu Van, Nghia Tran Van

Optimal Load Balancing in Three Level Cloud Computing Using Osmtic Hybrid and Firefly Algorithm
Rai Himanshu, Ojha Sanjeev Kumar, Alexey N. Nazarov

Reliable Detection of Dynamic Anomalies with Application to Extracting Faint Space Object Streaks from Digital Frames
Nikita R. Berenkov, Alexander G. Tartakovsky, Alexei E. Kolessa

On the Concatenated Code Constructions for Slotted Multiuser Communication Channel
Fedor Ivanov

A Hybrid Approach for Process Scheduling in Cloud Environment Using Particle Swarm Optimization Technique
Rai Himanshu, Ojha Sanjeev Kumar, Alexey N. Nazarov

Joint SCO and CFO Estimation Algorithm for ISS-OFDM Systems
Semyon V. Dorokhin

10:00-19:00

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Research of Performance Parameters of Virtual Switches with Openflow Support
Yuriy A. Ushakov, Margarita V. Ushakova, Aleksandr Bolodurin, Leonid V. Legashev, Alexander E. Shukhman

Estimation of the Capacity of a Multi-User Vector Disjunctive Channel for Arbitrary Input Distributions
Fedor Ivanov, Alexey A. Kreschuk, Nikolay Shevel, Vyacheslav Dyrenkov

Multicarrier Modulation Schemes Efficiency Investigation in Shallow Water Hydroacoustic Communications Application
Sergey V. Dushin, Igor Yu. Kurov, Sergey S. Shavrin, Viktor S. Aleshin, Mais P. Farkhadov

Satellite Monitoring as a Basis for Developing a Forest Fire Simulation Model
Igor V. Zimin, Pavel A. Golovinskiy

OMP based Channel Estimation in Millimeter Wave MIMO Systems with IQ Imbalance
Wang Yinglin

Design of Rate-Compatible Low-Density Parity-Check Codes with Constant Check Matrix
Le Shon, Evgeny Lichobabin

Compatibility Tests of Digital Terrestrial Audio Broadcasting Systems CDR and RAVIS
Wang Shuyu, Zhang Chao, Pan Changyong, Zhang Guoting

Radio Resource Management in 5G networks
Vladislav V. Matyukhin, Alexey V. Chernov, Michael Somov, Egor Barashov, Julia Chernova, Victor Mishin

Performance Evaluation of Uplink NOMA in Wi-Fi Networks
Aleksey A. Kureev, Grigory Korolev, Evgeny M. Khorov, Dmitry Shmelkin

Features of a Coarse Frequency Synchronization for DVB-S2X System
Liubov A. Antiufrieva

Adaptive Transmission Parameters Selection Algorithm for URLLC Traffic in Uplink
Aleksei E. Shashin, Andrey A. Belogaev, Artem N. Krasilov, Evgeny M. Khorov

Study on Simultaneous Transmission and Reception on Multiple Links in IEEE 802.11be networks
Yaroslav E. Okatev, Ilya A. Levitsky, Evgeny M. Khorov

Enhanced Mixture Detectors for Spectrum Sensing in Cognitive Radio Networks
Zhao Wenjing, Luo Xuesong, Li He, Jin Minglu

Improvement of the Approximate Method for the Comparison Operation in the RNS
Mikhail G. Babenko, Egor Shiryaev, Elena I. Golimblevskaia, Andrei Tchernykh, Pulido-Gaytan Bernardo

Reliability Analysis of a Multicopter Flight Module of a High-Altitude Telecommunications Platform Operating in a Random Environment
Nguyen Duy Phuong, Dmitry V. Kozyrev

10:00-19:00

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Session 2. Radio Communication and Radiolocation Systems

**Moderators: Prof. Sergey P. Skobelev, PJSC «Radiophysics», Russia
Prof. Alexander V. Shishlov, PJSC «Radiophysics», Russia**

A Family of Optimal Polynomial Windows for Harmonic Analysis with Arbitrary Spectrum Sidelobe Falloff Rate

Gennady V. Zaytsev, Alexander D. Khzmalyan

The Influence of the Material and Geometrical Shape of a Semiconductor Nanoparticle on the Sensitivity of an Optical Plasmon Sensor

Sergey V. Sakhno, Valery A. Astapenko, Andrey V. Yakovets, Egor S. Khramov, Evgeniya V. Sakhno

Comparative Study of Spherical Electromagnetic Black Holes with Positive and Negative Refractive Indexes

Yana I. Chizhevskaya

An Algorithm of the Hybrid Projection Method for Analysis of Axially Symmetric Excitation of Inhomogeneous Dielectric BOR

Ekaterina I. Semernya

Analysis of wave focusing by Mikaelian lenses in 2D case of E-polarization

Mikhail M. Kushneryov, Sergei P. Skobelev

Modification of the Method of EFIE in 2D Problem of H-Polarized Wave Scattering by PEC Cylinder of Arbitrary Cross-Section

Dmitry A. Borisov, Sergei P. Skobelev

The Analytical Model of a Polyatomic Crystal Lattice with a Continuous Potential

Elizaveta Barabanova A, Konstantin A. Vytovtov, Vladimir M. Vyshnevsky

The Spectroscopic Correspondence Principle for the Time Evolution of Quantum Transitions under the Action of Electromagnetic Pulses

Sergey V. Sakhno, Valery A. Astapenko, Evgeniya V. Sakhno

Miniaturization of the Volumetric Strip-Slot Transition and Investigation of its Matrix of S-parameters

Dmitry G. Fomin, Nikolay V. Dudarev, Stanislav N. Darovskikh

Circularly Polarized Multilayer Printed Radiator for Wide-Angle Scanning Ka-band Phased Array

Ruslan A. Kolesnikov

Cylindrical Aesa of Microstrip Dipols for the Ground Communication System

Elchin V. Gadzhiev, Elena V. Ovchinnikova, Alexander Cherkashin, Dinh To Nguen, Svetlana G. Kondratieva, Pavel A. Shmachilin

Application of Microstrip Antennas for Perspective Vehicle–Board Systems and Complexes

Elchin V. Gadzhiev, Elena V. Ovchinnikova, Alexander Generalov, Svetlana G. Kondratieva, Pavel A. Shmachilin, Vladimir Skripachev

10:00–19:00

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Application of Horn Antennas for Perspective Vehicle–Board Systems and Complexes
Elchin V. Gadzhiev, Elena V. Ovchinnikova, Nguen Dinh To, Svetlana G. Kondratieva, Pavel A. Shmachilin, Vladimir Skripachev

Feed Array with Overlapping Clusters and Flat-topped Radiation Pattern for Multi-beam Satellite Communication Antennas
Yuriy V. Krivosheev, Alexander V. Shishlov, Irina L. Vilenko, Uhm Manseok, Yun So Hyeun

Dynamic Patterns of Scattering for Phased Array Modeling
Maksim G. Vakhitov, Denis S. Klygach, Amur B. Khashimov

Calculation of the Dielectric Permittivity of Phase-Inhomogeneous Powder Compositions
Maksim G. Vakhitov, Denis S. Klygach, Amur B. Khashimov, Alexsey Trukhanov

Measurement of Electrodynamical Parameters at Low Temperatures in the Frequency Range up to 18 GHz
Maksim G. Vakhitov, Denis S. Klygach, Denis A. Vinnik, Vladimir E. Zhivulin

High-Performance Diagnostic Method for Unstable Failures of Phased Array Antenna Elements
Alexander O. Manichev

Staircase Aperture Loaded MPA for (B41/n41) Sub-6 GHz for 5G Domain
Dwivedi Ajay Kumar, Tripathi Pramod Narayan, Yadav Shekhar, Singh Vivek

High-Speed Indoor Visible Light Communication System using Red Laser Diodes
Chai Shuzhou, Zhang Hongming, Song Jian, Zhu Jinghui

A method for Obtaining Radar Images in the Near Zone Using the FMCW Radar
Denis G. Okhapkin

Design and Research of a Model of Calculation of Orientation Parameters of the Object of Observation Using Polarization Scattering Matrices
Artyom A. Kopylov, Igor V. Zimin

Adaptive Calibration Method for Time-Interleaved ADCs
Anna S. Fateeva, Igor E. Kashchenko

Efficient Algorithm for Initialization of Object Tracks Based on Change-point Detection Method
Valentin S. Spivak, Alexander G. Tartakovsky

Algorithm for Estimating the Distance of Meteorological Target in a Airport Surveillance Radar With a Chirp Signal
Nguyen Van Khuong, Stanislav V. Zaretsky, Dmitry D. Stupin

10:00–19:00

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Session 3. Computing systems and data processing

**Moderators: Vladimir M. Feldman, Dr., senior researcher, deputy general director,
PJSC «Brook INEUM», JSC «MCST»**

Term-rank Codes for Data Storage Systems

Pham Huu Loc

Heterogeneous, Semi-structured Data Analysis in Information Security

Maria A. Poltavtseva, Pavel V. Semyanov, Elizaveta A. Zaitzeva

Verification of a Model of the Isolated Program Environment of Subjects Using
the Lamport's Temporal Logic of Actions

Andrei Kanner, Tatiana Kanner

Geopotential Calculations Optimisation

George Martvel

Domain Specific Language of Traffic Flow Factor Framework

Habinshuti Francois Xavier

Analysis of Residue Number System Corrective Properties for Designing Reliable
Cloud Storage

Ekaterina A. Kuchukova, Victor V. Berezhnov

Method for Analyzing the Corrective Ability of Residue Number System

Ekaterina A. Kuchukova, Victor V. Berezhnov

Hardware Implementation of the Reverse Conversion RNS-WNS on FPGA

Mikhail G. Babenko, Anton S. Nazarov, Elena I. Golimblevskaia

Efficient Hardware Implementation of Forward Conversion WNS-RNS on FPGA

Mikhail G. Babenko, Anton S. Nazarov, Elena I. Golimblevskaia

Development of Methods for Assessment and Providing of Reliability of Memristor-
based Artificial Neural Networks

Sergey N. Danilin, Ilya A. Bordanov, Anton D. Zuev, Sergey V. Panteleev

Homomorphic Comparison Methods: Technologies, Challenges, and Opportunities

*Mikhail G. Babenko, Andrei N. Tchernykh, Elena I. Golimblevskaia,
Pulido-Gaytan Bernardo, Arutyun I. Avetisyan*

Algorithm to Compute Term Rank of a Matrix Based on the Construction a Bipartite Graph

Pham Huu Loc

The algorithm for controlling the use of big personal data

Irina M. Kosmacheva, Nadezhda V. Davidyuk, Irina Sibikina, Sergey V. Belov, Ivan Kuchin

Researching a distributed computing automation platform for big data processing

*Yuriy A. Ushakov, Margarita V. Ushakova, Nadezhda F. Bahareva, Leonid V. Legashev,
Denis I. Parfenov, Irina P. Bolodurina*

10:00-19:00

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Application of the Bluetooth Protocol for Data Transfer from Computer to the Brain in Active BCI-Interfaces and Development of the Small Bluetooth Neural Stimulation Device

Timur K. Bergaliyev, Daniil Berezhnoy, Sergey V. Sakhno

On Synthetic Process Trees Reconstruction Using Graph-based Operation Restore Model

Nikolay N. Efanov

Performance Analysis of Network-on-chip Topologies for Elbrus Multi-core processor

Evgenii S. Kozhin, Alexey S. Kozhin, Danil I. Shpagilev

Design of Data Compression Mechanism in Cache Memory of Elbrus Processors

Alexander V. Surchenko, Alexey S. Kozhin

Features of Heterogeneous Dynamic Systems

Evgeny A. Popov, Yury V. Shornikov

Attack on the address resolution protocol

Galina V. Nikonova, Petr P. Stepanov, Tatyana S. Pavlychenko, Anatoly S. Gil

Graph Processing System for Network Science

Mikhail Chernoskutov

Comparative analysis of indoor positioning methods based on the wireless sensor network of Bluetooth Low Energy beacons

Alexander V. Astafiev, Anton A. Demidov, Ilya E. Kondrushin, Michael V. Makarov

Session 4. Artificial intelligence systems (AI) in telecommunications

Moderators: Prof. Prithish Varadwaj, Indian Institute of Information Technology, India

Mikhail S. Burtsev, Head Laboratory of Neural Systems and Deep Learning, MIPT, Russia

Applying Virtual Modelling to Verify Control Systems Decision with Artificial Intelligence in Railway Transport

Ekaterina M. Zakharova, Roman A. Gorbachev, Andrey N. Novikov, Andrey V. Kalinkin, Artem V. Cheranov

Research and Development of an Intelligent System for Rapid Train Schedule Adjustment Based on Step-by-step Neural Control

Ekaterina M. Zakharova, Roman A. Gorbachev, Andrey N. Novikov, Ivan S. Makarov

Tasks of Building and Supporting the Functioning of the Communication Networks Based on Unmanned Aerial Vehicles

Mikhail V. Khachumov, Vyacheslav M. Khachumov, Ivan Kolchinsky

Dish-ID: a neural-based method for ingredient extraction and further recipe suggestion

Maria I. Tikhonova, Alena S. Fenogenova, Saydash Miftakhov, Ilya Shchuka, Vladislav Patrushev

10:00-19:00

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Application of Machine Learning Methods in Human-Machine Interfaces Based on Biological Signals of Human Muscles

Timur K. Bergaliyev, Sergey V. Sakhno, Yuri Kovalev

Situational management of production systems based on a balanced scorecard

Anna Khanova, Irina Bondareva, Oleg Protalinsky, Yulya Khanova

ReRAM-based Artificial Neural Network for a Bidirectional Adaptive Neural Interface

Sergey A. Shchanikov, Anton D. Zuev, Ilya A. Bordanov, Sergey N. Danilin, Dmitry S. Korolev, Alexey I. Belov, Yana I. Pigareva, Alexey S. Pimashkin, Alexey N. Mikhaylov, Viktor B. Kazantsev

Differentiation of Sliding Rescaled Ranges: New Approach to Encrypted and VPN Traffic Detection

Alexander V. Ivchenko, Ravil R. Nigmatullin, Semyon V. Dorokhin

QoE Models Improving: New Look at the Quality of Experience Function

Alexander V. Ivchenko, Lyubov A. Antyufrieva

Implementation of the parallel manipulator kinematics direct problem solver on a heterogeneous system

Andrew Gorchakov

Research Application of Ensemble Machine Learning Methods to the Problem of Multiclass Classification of DDoS Attacks Identification

Denis Parfenov, Larisa Kuznetsova, Natalia Yanishevskaya, Irina Bolodurina, Arthur Zhigalov, Leonid Legashev

Multi-Step Ballistic Vehicle Trajectory Forecasting Using Deep Learning Models

Nikolai E. Gaiduchenko, Pavel A. Gritsyk, Yanka I. Malashko

Intelligent technologies in decision-making systems

Bui Truong An, Pashchenko Fedor Fedorovich, Alexander Fedor Fedorovich, Tran Duc Hieu

Development and research of an evolutionary algorithm for the formation of a feature space based on AutoML for solving the problem of identifying cyber attacks

Denis Parfenov, Irina Bolodurina, Alexander Shukhman, Lubov Zabrodina, Arthur Zhigalov

The Associative Relationship of an Intelligent Information Processing System with External Environment of its Existence

Mikhail Makarov, Alexander Astafiev, Natalia Trantina


Predicting Smell Perception from Molecular Descriptors Using Machine Learning Approach

Varadwaj Pritish Kumar, Tiwary Uma Shanker, Tyagi Pankaj, Vishwakarma Anupam

13:00-14:00 Break

10:00-19:00

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The organizing committee reserves the right to make changes and additions to the conference program



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