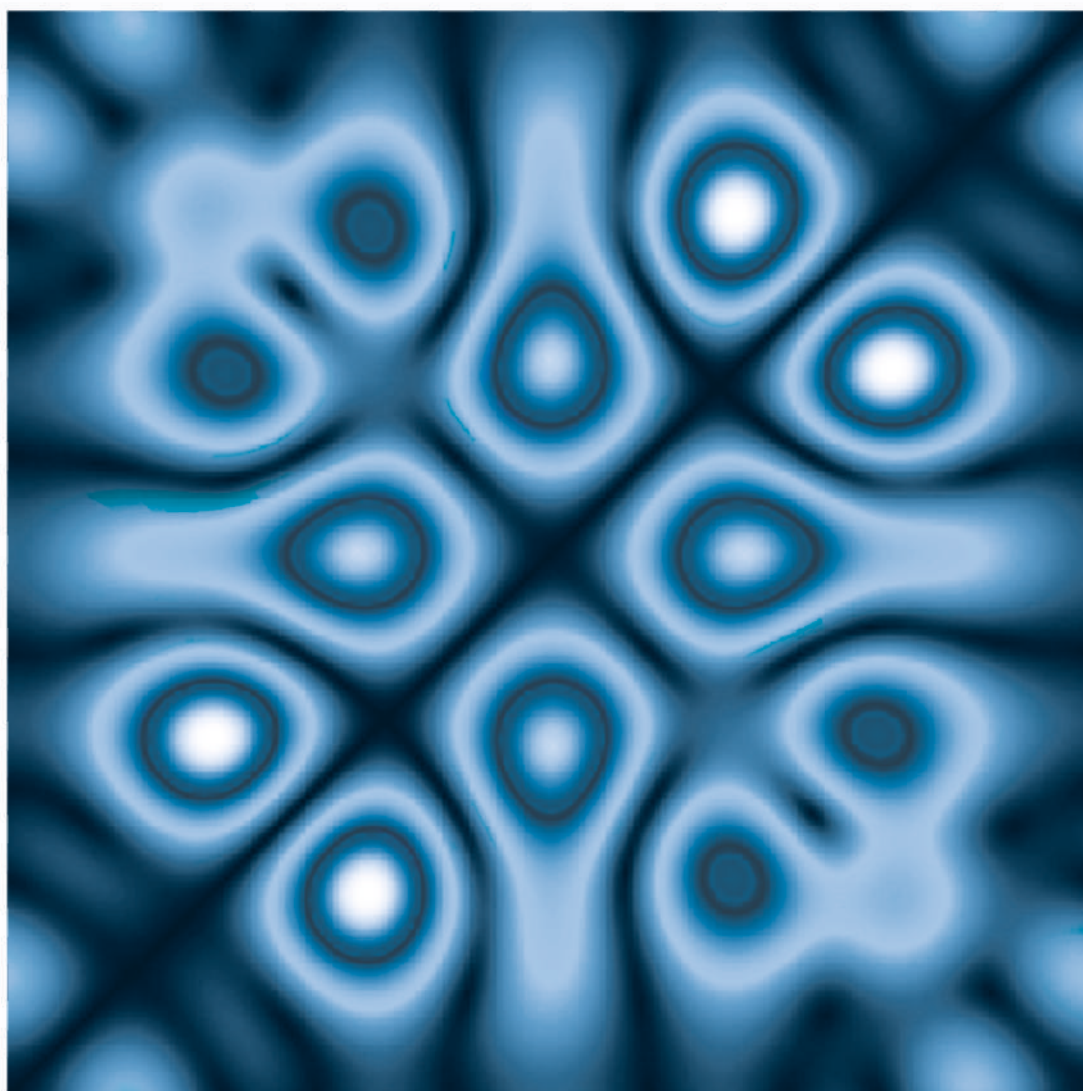# Program of ITNT-2020

VI International Conference on Information Technology anf Nanotechnology

26-29 May 2020
Samara, Russia

The VI International Conference on Information Technology and Nanotechnology (ITNT-2020) takes place in Samara (Russia) from May 26th to 29th, 2020. The Conference intends to provide a forum for leading scientists from all over the world to discuss the latest advances in the basic and applied research in the field of Information Technology and Nanotechnology, attract young people to advanced scientific research, and share the latest trends in training and research programs for future ITNT specialists.

Organizers

Samara National Research University named after S.P. Korolev (Samara University)

Image Processing Systems Institute – Branch of the Federal Scientific Research Centre "Crystallography and Photonics" of the Russian Academy of Sciences (IPSI RAS- branch of FSRC "Crystallography and Photonics" RAS)

Partners

IEEE

Huawei

NVidia

CERN Openlab

CopterSpace

Haulmont

MegaFon

LLC Computer Technologies

Media-Partners

Computer Optics

Journal Photonics

Conference Venue

The ITNT-2020 is held in the 1st building of the Samara University.
Address: Molodogvardeyskaya st. 151, Samara, Russia
In 2020, ITNT moved to online. Additional details on the [Website](#).

Conference topics

Section 1 - Computer Optics and Nanophotonics
- Diffraction Optics
- Planar Optical Structures
- Optical Imaging Systems
- Hyperspectral Imaging Systems
- Nanophotonics
- Fiber Optics

Section 2 - Image Processing and Earth Remote Sensing
- Digital Image Processing
- Visual Recognition and Retrieval
- Motion Analysis
- Scene Reconstruction
- Remote Sensing Image Processing and Analysis
- Multimedia Protection and Information Hiding
- Geoinformatics

Section 3 - Mathematical Modeling of Physico-Technical Processes and Systems
- Mathematical Modeling of Information Processes;
- Mathematical Modeling of Physical Processes and Phenomena;
- Mathematical Modeling of Technical Systems.

Section 4 - Data Science
- Data Mining
- Machine Learning
- Security, Cryptography

High-Performance Computing

Programm Committee

Programm Committee Chair

Krasnikov G.Ya. − academician of RAS, Prof., Acting Chairman of the Department of nanotechnologies and information technologies of the RAS, Moscow, Russia.

Programm Committee Co-Chair

Soifer V.A. − academician of RAS, Prof., President of Samara University, Samara, Russia.

Programm Committee Vice-Chair

Kazanskiy N.L. − Prof., Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia.

Programm Committee Member

Kalachev L. − Prof., The University of Montana, Montana, USA;

Korobeinikov A. − Prof., School of Mathematics and Information Science, Shaanxi Normal University, Xi'an, China;

Korotkova O. − Prof., University of Miami, Coral Gables, USA;

Niemann H. − Prof., Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany;

O'Faolain L. − Prof., Tyndall National Institute, Cork, Ireland;

Sazhin S. − Prof., University of Brighton, Brighton, United Kingdom;

Sobolewski M. − Prof., Polish-Japanese Institute of IT, Warsaw, Poland;

Bychkov I.V. − academician of RAS, Prof., Matrosov Institute for System Dynamics and Control Theory of Siberian Branch of Russian Academy of Sciences, Irkutsk, Russia;

Voevodin, Vl. V. − Prof., Lomonosov Moscow State University, Moscow, Russia;

Gulyaev Yu. V. − academician of RAS, Prof., The Kotel'nikov Institute of Radio-engineering and Electronics (IRE) of Russian Academy of Sciences, Moscow, Russia;

Zheltov S.Yu. − academician of RAS, Prof., V.A. FGUP "GosNIIAS", Moscow, Russia;

Zhuravlev Yu.I. − academician of RAS, Institution of Russian Academy of Sciences Dorodnicyn Computing Centre of RAS, Moscow, Russia;

Kaloshin V. A. − Prof., The Kotel'nikov Institute of Radio-engineering and Electronics (IRE) of Russian Academy of Sciences, Moscow, Russia;

Karpeev S.V. − Prof., Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Konov V. I. − Prof., A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia;

Kulchin Yu. N. − academician of RAS, Prof., Institute of Automation and Control Processes, Vladivostok, Russia;

Organizing Committee

Organizing Committee Chair

Soifer V.A. − academician of RAS, Prof., President of Samara University, Samara, Russia.

Organizing Committee Co-Chair

Bogatyrev V.D. − Prof, Rector of Samara University, Samara, Russia.

Organizing Committee Vice-Chair

Kazanskiy N.L. − Prof., Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Sergeev V.V. − Prof., Samara University, Samara, Russia;

Kuprianov A.V. − Prof., Samara University, Samara, Russia.

Executive Secretary

Kozlova E.S. − Dr., Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia.

Organizing Committee Member

Archibasov A.A. − Samara University, Samara, Russia;

Blank V.A. − Samara University, Samara, Russia;

Boyarkin Yu.N. − Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Vybornova Yu.D. − Samara University, Samara, Russia;

Goshin E.V. − Dr., Samara University, Samara, Russia;

Danilenko A.N. − Dr., Samara University, Samara, Russia;

Donon, Y. − Samara University, Samara, Russia;

Kazarin S.V. − Department of Information Technologies and Communications of Samara Region, Samara, Russia;

Kamynin D.V. − Project Office For Digital Development Of Samara Region, Samara, Russia;

Kirsh D.V. − Samara University, Samara, Russia;

Kotov A.P. − к.т.н., Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Kravcova N.S. − Samara University, Samara, Russia;

Kudryashov D.V. − Samara University, Samara, Russia;

Misievich S. K. − Samara University, Samara, Russia;

Petrov M.V. − Image Processing Systems Institute of RAS − Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Podlipnov V.V. – Image Processing Systems Institute of RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Popov S.B. – Prof., Samara University, Samara, Russia;

Rycarev I.A. – Samara University, Samara, Russia;

Smagin S.V. – Image Processing Systems Institute of RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Sovetkina M.A. – Samara University, Samara, Russia;

Stafeev S.S. – Dr., Image Processing Systems Institute of RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia;

Fedoseev V.A. – Dr., Samara University, Samara, Russia;

Fomchenkov S.A. – Samara University, Samara, Russia;

Schepakina E.A. – Prof., Samara University, Samara, Russia;

Yakimov P. Yu. – Dr., Samara University, Samara, Russia;

Yakunenkova D.M. – Image Processing Systems Institute of RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia.

Conference Schedule

Time zone: Samara (GMT +4)

26 May		27 May		28 May		29 May	
10:00-10:30	*Openning Ceremony*	**10:00-12:00**	*Plenary Session*	**10:00-12:00**	*Plenary Session*	**10:00-12:00**	*Plenary Session*
10:30-12:30	*Plenary Session*						
12:30-13:00	*Break*	**12:00-13:00**	*Break*	**12:00-13:00**	*Break*	**12:00-13:00**	*Break*
13:00-18:15	*Online session Section 4*	**13:00-15:30**	*Online session Section 1*	**13:00-17:30**	*Online session Section 2*	**13:00-15:30**	*Online session Section 3*
						15:30-16:00	*Break*
						16:00-16:30	*Closing Ceremony*

The Plenary Session talks, as well as the talks from Online Sections, will be available for discussion during their presentation according to the Conference Schedule.

You can ask the authors using comments in YouTube or via the [feedback form](#) on our website. In this case, authors will answer questions using comments or via email.

You can look through the talks posted as Video Presentations or Posters during the whole time of the Conference. If you want to ask the authors, please, follow the links and put your question in the comments. You can also use the [feedback form](#) on our website.

Program of VI International Conference on Information Technology and Nanotechnology (ITNT-2020)

26 May (Tuesday)
Time zone: Samara (GMT +4)

Chair: Prof. Alexander Kupriyanov
Secretary: Natalia Kravtsova, Igor Rytsarev

10:00-10:30	**Opening of the Conference**
10:30-12:30	**Plenary Session**
10:30	**Prof. Vladimir Voevodin** **(Lomonosov Moscow State University, Moscow, Russia)** *Supercomputer technology: end-to-end digital technology and university curricula*
11:00	**Anton Dzhoraev** **(Nvidia, Russia)** *Trends in data science and HPC*
11:30	**Dr. Andrey Chernov** **(Geoinformsputnik, Samara, Russia)** *Analysis and modeling of urban environment based on big geodata*
12:00	**Prof. Igor Sheremet** **(Russian Foundation for Basic Research (RFBR) , Moscow, Russia)** *Multigrammatical Approach to the Assessment of Sustainability of Intelligent Transport Systems*
12:30-13:00	**Break**
13:00-18:15	**Section 4** **Online-Session**

Program of VI International Conference on Information Technology and Nanotechnology (ITNT-2020)

27 May (Wednesday)
Time zone: Samara (GMT +4)

Chair: Prof. Roman Skidanov
Secretary: Natalia Kravtsova, Igor Rytsarev

10:00	**Prof. Alexander Volyar** **(V.I. Vernadsky Crimean Federal University, Simferopol, Russia)** *Digital sorting of laser beams by radial and azimuthal numbers*
10:30	**Dr. Andrey Bogdanov** **(ITMO University, St. Petersburg, Russia)** *Bound states of the continuum in photonics*
11:00	**Prof. Vladimir Belotelov** **(Lomonosov Moscow State University, Moscow, Russia)** *Antiferromagnetic magnetoplasmonics*
11:30	**Prof. Vladimir Niziev** **(Institute on Laser and Information Technologies of RAS, Moscow, Russia)** *New optical methods for improving the radiation quality of high-power lasers for remote sensing and force exposure*
12:00-13:00	**Break**
13:00-14:30	**Section 1** **Online-Session**

Program of VI International Conference on Information Technology and Nanotechnology (ITNT-2020)

28 May (Thursday)
Time zone: Samara (GMT +4)

Chair: Prof. Vladislav Myasnikov
Secretary: Natalia Kravtsova, Igor Rytsarev

10:00	**Alexey Gonnochenko** **(Sberbank Robotics Laboratory, Moscow, Russia)** *Breakthrough Technologies in Sberbank Robotics Laboratory*
10:30	**Prof. Leonid Mestetsky** **(Lomonosov Moscow State University, Moscow, Russia)** *Measures to compare the shape of objects in aerospace images*
11:00	**Vladimir Arlazarov** **(Smart Engines, Moscow, Russia)** *Recognition of documents with fixed layout on a mobile device: coarse-to-fine approach*
11:30	**Prof. Petia Radeva** **(Universitat de Barcelona, Barcelona, Spain)** *Deep Learning and Food Image Analysis*
12:00-13:00	**Break**
13:00-17:30	**Section 2** **Online-Session**

Program of VI International Conference on Information Technology and Nanotechnology (ITNT-2020)

29 May (Friday)
Time zone: Samara (GMT +4)

Chair: Yann Donon
Secretary: Natalia Kravtsova, Igor Rytsarev

10:00	**Prof. Lijun Zhang** **(Shandong University of Science and Technology, Shandong, China)** *Traveling wave of a class of higher-order nonlinear wave equations*
10:30	**Kirill Polovnev** **(Nestle Rossiya LLC , Samara branch, Samara, Russia)** *Digitalization in operations. Digitalization of the continuous production cycle.*
11:00	**Dr. Alberto Di Meglio** **(CERN OpenLab, CERN, Geneva, Switzerland)** *Quantum Technology Initiative at CERN*
11:30	**Prof. Sergey Sazhin** **(University of Brighton, Brighton, United Kingdom)** *Mathematical and engineering modelling of sprays*
12:00-13:00	**Break**
13:00-15:30	**Section 3** **Online-Session**

Online Session

26 May (Tuesday)
Time zone: Samara (GMT +4)

Section 4 "Data Science"

Chair: Vladimir Fursov, Artem Nikonorov, Sergey Popov
Secretary: Kristina Medvedeva, Kirill Pugachev

13:00-13:15	**ID 379**	**Olga Sushkova, Alexei Morozov, Alexandra Gabova and Alexei Karabanov** *Development of a method for early and differential diagnosis of Parkinson's disease and essential tremor based on analysis of wave train electrical activity of muscles*
13:15-13:30	**ID 363**	**Renata Tolmacheva, Yury Obukhov and Ludmila Zhavoronkova** *Monitoring of inter-channel EEG phase synchronization in patients with traumatic brain injury before and after rehabilitation*
13:30-14:45	**ID 443**	**Konstantin Serdyukov and Tatyana Avdeenko** *Researching of methods for assessing the complexity of program code when generating input test data*
13:45-14:00	**ID 208**	**Andrey Konstantinov** *An approach to the formation of a training sample for assessing the emotional coloring of social network posts using machine learning*
14:00-14:15	**ID 596**	**Olga Andreeva, Alexander Nesterov, Tatiana Trubnikova, Vyacheslav Ivanov and Yelena Svechnikova** *Ethical and Legal Problems of Data Science (On Case Study of Video Recording Technologies)*
14:15-14:30		**Break**
14:30-14:45	**ID 250**	**Vladimir B. Barakhnin, Olga Yu. Kozhemyakina, Pastushkov S. Ilya, Kuznetsova V. Irina and Yulia S. Borzilova** *Improvements to automated the algorithm definition of rhyme*
14:45-15:00	**ID 69**	**Alexey Zhelepov and Nadezhda Yarushkina** *IT specialists search algorithm based on repositories*
15:00-15:15	**ID 297**	**Vadim Zinatullin and Sergey Koledin** *Analysis of work scientists directions based on the processing of natural language texts*
15:15-15:30	**ID 300**	**Sergey Koledin, Edgar Zubaerov, Evgenii Kislicin, Vladislav Aptikaev and Ruslan Almakaev** *Parallelizing a solution of multi-purpose optimization problem for the conditions of a chemical reaction based on CUDA technology*
15:30-15:45	**ID 775**	**Alla Kravets** *Research of the LDA algorithm processing results on high-level classes of patents*
15:45-16:00	**ID 276**	**Alexander Feoktistov and Roman Kostromin** *A multi-agent model of allocating resources of a high-performance computing environment in the processing of job flows*
16:00-16:15		**Break**
16:15-16:30	**ID 380**	**Sergey Gorsky, Roman Kostromin, Alexander Feoktistov and Igor Bychkov** *Toolkit for supporting high-performance computing in subject-oriented heterogeneous environments*
16:30-16:45	**ID 736**	**Vladimir Vakourin, Andrey Kopylov, Oleg Seredin and Konstantin Mertsalov** *On the multiclass classification of words by a recurrent neural network with memory (LSTM) as applied to the problem of recognition of named entities*

16:45-17:00	ID 285	**Alexey Kovalenko and Yana Demyanenko** *Neural network confidence model*
17:00-17:15	ID 65	**Valeriia Guryanova** *Transfer Learning for tuberculosis screening by single-channel ECG*
17:15-17:30	ID 788	**Egor Ershov, Denis Shepelev, Dmitry Nikolaev and Valentina Bozhkova** *The problem of underwater images modeling based on terrestrial ones*

27 May (Wednesday)
Time zone: Samara (GMT +4)

Section 1 "Computer Optics and Nanophotonics"

Chair: Svetlana Khonina
Secretary: Alexey, Porfirev, Mariya Sovetkina

13:00-13:15	ID 88	**Maxim Yavorsky, Dmitriy Vikulin and Constantine Alexeyev** *OAM transfer between optical and acoustical vortices in optical fibers*
13:15-13:30	ID 549	**Natalya Moiseeva** *Transformation of a vortex polarized beam in an anisotropic medium*
13:30-13:45	ID 52	**Angelina Moroz, Vadim Davydov, Roman Davydov and Kirill Malanin** *Fiber-optic information transmission system for interference compensation circuitry in a small-sized active phased array antenna*
13:45-14:00	ID 227	**Diana Dmitrieva, Valeria Pilipova, Elena Andreeva, Vadim Davydov and Valentin Dudkin** *The method for determining of negative exposure to γ - radiation on fiber-optic information transmission systems*
14:00-14:15	ID 407	**Andrey Agafonov, Anton Reshetnikov, Ivan Tzibizov and Alexey Shakhmin** *The technology of manufacturing metal-dielectric photonic crystals for THz and millimeter-wave ranges by 3D printing*
14:15-14:30	ID 258	**Eugene Bukhanov, Yuru Gurevich and Dmitry Shabanov** *Modeling an optical properties of plant epicular wax*
14:30-14:45	ID 341	**Fedor Sidorov and Alexander Rogozhin** *New microscopic approach to e-beam lithography processes simulation*
14:45-15:00	ID 529	**Ivan Nemtsev, Olga Shabanova, Nikolay Shestakov, Alexander Cherepakhin, Alexander Ivanenko and Victor Zyryanov** *Photonic crystal structures based on submicron particles of polymethyl methacrylate*
15:00-15:15	ID 590	**Yuri Kachurin, Alexander Krukov and Oleg Kananykhin** *Macro usage for analyzing of a telescopic system aberrations in ZEMAX*
15:15-15:30	ID 479	**Anton Nalimov, Victor Kotlyar and Sergey Stafeev** *Optimizing of Poynting vector and light intensity after secant gradient lens*

Section 2 "Image Processing and Earth Remote Sensing"

Chair: Andrey Kuznetsov, Victor Fedoseev
Secretary: Yulia Vybornova

13:00-13:15	ID 601	**Artyom Makovetskii, Sergei Voronin, Vitaly Kober and Alexei Voronin** *An algorithm for rough alignment of point clouds in three-dimensional space*
13:15-13:30	ID 602	**Artyom Makovetskii, Vitaly Kober, Alexei Voronin and Dmitrii Zhernov** *Facial recognition and 3D non-rigid registration*
13:30-14:45	ID 254	**Alexey Ruchay, Konstantin Dorofeev, Vsevolod Kalschikov and Anastasya Kober** *Accuracy analysis of surface reconstruction from point clouds*
13:45-14:00	ID 396	**Irina Palchikova, Igor Latyshov, Evgenii Smirnov, Alexander Kondakov and Vasily Vasiliev** *Shot trace analysis using the computer vision*
14:00-14:15	ID 217	**Anton Agafonov and Alexander Yumaganov** *A comparison of 3D objects detection methods for an autonomous car driving problem*
14:15-14:30	ID 428	**Dmitry Murashov** *Application of an information model for selecting parameters of image segmentation algorithms*
14:30-14:45	ID 665	**Sergey Arseev and Leonid Mestetsky** *Handwritten Text Recognition Using Reconstructed Pen Trace with Medial Representation*
14:45-15:00	ID 102	**Radik Magdeev and Alexsandr Tashlinskii** *Efficiency of pseudo-gradient identification of similar shape objects in binary and grayscale images*
15:00-15:30		**Break**
15:30-15:45	ID 355	**Sergey Rylov** *High-dimensional grid-based clustering for multispectral satellite image segmentation*
15:45-16:00	ID 28	**Mukesh Singh Boori, Alexander Kupriyanov, Sarla Choudhary and Komal Choudhary** *High Resolution 2019 land cover map of Southeast Asia*
16:00-16:15	ID 257	**Tatiana Shulga, Ludmila Verzhevskaya and Alesya Medvedeva** *The use of the data from Sentinel-2's MSI instrument to estimate the anthropogenic load on the coastal areas of the Crimea in 2017–2019.*
16:15-16:30	ID 373	**Mikhail Elantcev, Igor Arkhipov and Renat Gafarov** *The modified method of statistical differentiation for the matching of aerial photograph and satellite images*
16:30-16:45	ID 27	**Anna Denisova, Anna Egorova and Vladislav Sergeyev** *Detection of forest vegetation boundaries using remote sensing data*
16:45-17:00	ID 71	**Anna Denisova and Alexander Belov** *Super-resolution reconstruction of remote sensing image using multi-temporal images with partial scene distortions*
17:00-17:15	ID 304	**Andrey Kuznetsov** *On deep learning approach in remote sensing data forgery detection*
17:15-17:30	ID 421	**Vadim Turlapov and Pavel Pahomov** *Investigation of correlation of empirical modes and low-frequency residues of hyperspectral image signatures*

29 May (Friday)
Time zone: Samara (GMT +4)

Section 3 "Mathematical Modeling of Physico-Technical Processes and Systems"

Chair: Vladislav Lyubimov
Secretary: Alexey Archibasov

13:00-13:15	**ID 67**	**Kamila Koledina and Sergey Koledin** *Information-computational system for optimizing the conditions for catalytic reactions*
13:15-13:30	**ID 376**	**Konstantin Trubitsyn, Galina Mikheeva, Ruslan Klebleev and Olga Kurganova** *Additional boundary conditions in heat conduction problems for multilayer structures*
13:30-14:45	**ID 377**	**Konstantin Trubitsyn, Ruslan Klebleev, Galina Mikheeva and Ekaterina Stefanyuk** *Identification of heat exchange coefficient in heat conductivity problems with asymmetric boundary conditions*
13:45-14:00	**ID 726**	**Alexander Chistyakov, Alla Nikitina, Yulia Belova, Vladimir Litvinov and Alena Filina** *Mathematical modeling of the hydrodynamic processes of shallow water bodies taking into account the processes of salt and heat transfer*
14:00-14:15	**ID 776**	**Alexander Sukhinov, Elena Protsenko, Valentina Sidoryakina and Sofya Protsenko** *Numerical simulation of bottom topography transformation taking into account the coastal shore protection structures*
14:15-14:30	**ID 497**	**Denis Milyakov, Vladimir Verba, Vladimir Merkulov and Andrew Plyashechnik** *Two approaches to simulating a group flight of unmanned aerial vehicles as systems with lumped and distributed parameters*
14:30-14:45	**ID 546**	**Alexander Kovartsev, Anastasia Nazarova and Vitaly Zakharchenko** *Recovery of the hydrounit performance characteristics via a few observations*
14:45-15:00	**ID 696**	**Alexander Kuznetsov** *Game-theoretic model of agents' motion over a terrain with obstacles*
15:00-15:15	**ID 268**	**Rinad Seidgazov and Fikret Mirzade** *Thermocapillary mechanism for recoil pressure creation on a metals in laser technologies with deep penetration*
15:15-15:30	**ID 481**	**Ivan Amelyushkin** *Molecular modeling of the interaction spherical and nonspherical particles with a relief body*

Video presentations

Section 1 " Computer Optics and Nanophotonics"

Track 1: "Beams"

ID 77: Artem Antonov
Approach for finding amplitude of the transmitted diffraction orders in the framework of a rigorous coupled-wave analysis

ID 113:   Dmitry Savelyev
Investigation of the cylindrically polarized beams focusing by a diffractive axicon using high-performance computer systems

ID 168:   Constantine Alexeyev, Elena Barshak, Dmitriy Vikulin, Boris Lapin and Maxim Yavorsky
Propagation of optical vortices in loop resonators on the basis of multimode optical fibers

ID 180:   Victor Kotlyar and Alexey Kovalev
Topological charge of Gaussian vortex light fields and their superpositions

ID 239:   Mikhail Kirilenko
Modeling the propagation of Laguerre-Gaussian modes through a random medium based on the analytical Karhunen-Loeve expansion

ID 249:   Linar Ahmetov:
The formation of polymorphic beams with diffraction-free properties

ID 420:   Elena Barshak, Constantine Alexeyev, Dmitriy Vikulin, Boris Lapin and Maxim Yavorsky
Structure and spectrum of modes with azimuthal number l>1 in twisted anisotropic optical fibers

Track 2: "Plasmons and metamaterials"

ID 23:   Ivan Shishkin, Daria Lizunkova and Natalya Latukhina
The process of pore formation on a textured silicon substrate during electrochemical etching: 3D model

ID 137:   Valentin But, Sergey Karpeev and Egor Karlin
Development and investigation of micro- and nanostructures of metamaterials to form the necessary characteristics and coefficients of piezoelements

ID 173: **M.A Butt, S.A Fomchenkov and H.H Mai**

Improving the sensitivity of a metal-insulator-metal semi-ring resonator cavity by embedding nanodots

ID 236: **Alexandra Savelyeva and Elena Kozlova**

Simulation of light focusing by microspheres

ID 238: **Elena Kozlova and Victor Kotlyar**

Simulation of plasmons on metal nano-ring

ID 362: **Dmitry V. Nesterenko, Shinji Hayashi and Victor Soifer**

Appproximation of Fabry-Pérot resonances in metal/dielectric/metal structures

ID 382: **Elena Kadomina, Evgeni Bezus and Leonid Doskolovich**

Parasitic scattering of Bloch surface waves

ID 442: **Vladimir Pavelyev, Svetlana Khonina, Konstantin Tukmakov, Sergey Degtyarev, Anton Reshetnikov, Boris Knyazev and Yulia Choporova**

Silicon subwavelength axicons for terahertz beam polarization transformation

ID 514: **Darya Prokopova, Evgeny Vorontsov, Nicolay Losevsky, Svetlana Kotova, Alexei Gorshelev, Ivan Eremchev and Andrey Naumov**

Phase diffraction optical elements for three-dimensional localization of CdSe / ZnS quantum dots

ID 683: **Galina Zaretskaya, Nicolay Cheplagin and Andrey Drozdovskii**

Transmission characteristics of ring resonator-loaded integrated optical waveguide

ID 385: **Constantin Losmanschii, Elena Achimova, Alexei Meshalkin, Vladimir Abashkin and Alexandr Prisacar**

Comparative characteristics of azopolymers: synthesis, optical and recording properties

Track 3: "Sensors and optical devices"

ID 32: **Nishant Tripathi, Vladimir Pavelyev, Andrei Mezhenin, Sunil Kumar, Mariia Sovetkina, Anastasiia Rymzhina and Vladimir Platonov**

Development of infrared radiation sensor for household electronic applications

ID 92: **Evgeni Bezus, Dmitry Bykov and Leonid Doskolovich**

Integrated spectral filters consisting of several dielectric ridges on the surface of a slab waveguide

ID 181: **Sergey Fomchenkov**

Development and research of a linearly changing narrow bandpass optical filter for hyperspectral equipment

ID 201: **Elizaveta Yarunova, Anton Krents, Nonna Molevich and Dmitriy Anchikov**

Stabilization of a broad-area laser with a modulated pump parameter using optical injection

ID 205: **Vladimir Podlipnov and Sergey Karpeev**

Spatial light modulator for creating vector beams

ID 284: **Vladimir Pavelyev**

THz/Far-IR Diffractive Optics: Methods, Applications, Perspectives

ID 386: **Dmitry Bykov, Evgeni Bezus, Linyong Qian and Leonid Doskolovich**

Optical properties of resonant gratings with slowly varying period

ID 390: **Elina Nepomnyashchaya and Olga Ponomareva**

Method of polarization-based visualization for skin health analysis

ID 393: **Olga Gubareva, Vladimir Burdin, Vladimir Gureev and Sergej Masyuk**

Simulation of data transmission in a simplex acousto-optical channel over a two-mode optical fiber

ID 402: **Veronica Cazac**

Improved 3D imaging of phase shifting digital holographic microscope by compensation for wavefront distortion

ID 778: **Evgenii Sechak, Andrey Rumyancev, Sergey Schesnyak and Viktor Dubrovich**

Alignment algorithm for composite mirrors by the method of moments

ID 207: **Vladimir Podlipnov, Sergey Karpeev and Vyacheslav Paranin**

Film sector optical element for creating inhomogeneous polarizations with phase correction of higher orders.

ID 493: **Vadim Davydov**

Multifunctional radar system for remote monitoring of the environment and the Earth's surface

Track 4: "Diffractive optics, Holography, Spectroscopy"

ID 247: **Denis Yablokov, Vladimir Pavelyev, Andrey Agafonov and Anatolii Eremin**

Computer optics software construction using multi-paradigm design

ID 349: **Nikolay Ivliev and Vladimir Podlipnov**

Investigation of the interaction of vortex beams with a microrelief on the carbaseolecontaining azopolymer

ID 394:   Dmitriy Dudnik and Sergey Sharangovich

Diffraction of quasimonochromatic light beams on multilayer inhomogeneous photopolymer holographic diffraction structures

ID 401:   Anastasia Kushkoeva, Elena Gorbunova, Alexander Chertov and Sergey Veselov

The results of the study of the opportunity of replacing the GIA GemSet, designed to assess the color of precious stones, with digital imitation measures for automated control systems

ID 452:   Yulia A. Khristoforova, Ivan A. Bratchenko, Ekaterina G. Borisova, Lyudmila A. Bratchenko, Tsanislava I. Genova, Alexander I. Gisbrecht, Alexander A. Moryatov, Sergey V. Kozlov, Petranka P. Troyanova and Valery P. Zakharov

The study of ex vivo and in vivo melanocytic skin neoplasms using near-infared fluorescence spectroscopy

ID 504:   Sofiya Ganchevskaya

Investigation of the influence of the number of quantization levels and technological errors on the point scattering function

ID 588:   Alexey Kuznetsov, Vadim Lukashkin, Anna Solomnikova and Vasiliy Zubkov

Calculation and modeling of electro-physical parameters of boron doped diamond plates: fitting of experimental admittance spectroscopy data

ID 609:   Veronika Blank and Roman Skidanov

Dispersion element based on modified lens and grating

ID 739:   Alexei Meshalkin, Constantin Losmanschii, Veronica Cazac, Elena Achimova and Vladimir Podlipnov

Analysis of diffraction efficiency of phase gratings in dependence of grooves number

ID 759:   Dmitry Artemyev, Vladimir Kukushkin, Ruzanna Shavaeva, Andrey Murashko, Olga Sharapova, Vladimir Zuev and Sergey Timofeev

The study of methods of spontaneous and resonance Raman spectroscopy of blood plasma for the rapid diagnosis of preeclampsia

ID 237:   Vladislav Zaitsev and Sergey Stafeev

The formation of an array of photonic nanostructures with square profile steps.

ID 392:   Ekaterina Savchenko, Ekaterina Vachugova, Elena Velichko and Elina Nepomnyashchaya

Investigation of the fullerenol solution parameters by combined technique based on light scattering

Section 2 " Image Processing and Earth Remote Sensing"

Track 1: "Image Processing"

ID 26: **Aleksey Maksimov and Vladislav Sergeyev**

Optimal fusing of video sequence images

ID 59: **Alina Bavrina, Vladislav Myasnikov and Ruslan Yuzkiv**

Parameterizable LSB watermarking method with adaptive key generation

ID 73: **Mikhail Gashnikov**

Adaptation of parameterized interpolation algorithms of multidimensional signals for hierarchical and interpolation compression methods

ID 218: **Yuliya Vybornova**

Method for construction of highly robust watermarks in the task of copyright protection for digital images

ID 315: **Olga Malenova, Victor Krasheninnikov, Alexey Subbotin and Yuliya Kuvayskova**

Pseudo-gradient algorithms for forecasting and filtering cylindrical images

ID 473: **Alexey Chulichkov and Egor Molkov**

Increasing the resolution of a non-negative brightness image distorted by a linear transformation

Track 2: "Image Analysis"

ID 120: **Dmitrii Troshkin, Alexander Chertov and Elena Gorbunova**

Assessment of the vitreousness of wheat samples based on the analysis of digital images of grains

ID 147: **Alexey Pyataev, Anna Pyataeva and Ruslan Brezhnev**

Pine crown density determination using local binary patterns

ID 158: **Aleksandr Shirokanev, Nikita Demin, Nataly Ilyasova, Rustam Paringer and Andrey Zolotarev**

Decision Tree Application for Fundus Image Segmentation

ID 193: **Lyudmila Kopeykina and Andrey V. Savchenko**

Personal data detection in photo album based on face clustering and text classification of scanned documents

ID 291: **Mikhail Lange and Andrey Lange**

On data classification efficiency based on a trade-off relation between mutual information and error probability

ID 579:   Stanislav Egorov, Igor Arkhipov and Tatiana Shelkovnikova
Information system for segmentation of nanoparticles in STM-images

Track 3: "Computer Vision"

ID 22:   Elena Medvedeva, Igor Trubin and Pavel Kasper
The algorithm for vehicle number plate detection

ID 136:   Yulia Agafonova, Andrey Gaidel, Pavel Zelter and Aleksandr Kapishnikov
Convolutional neural network for detection of pathological changes in MR images of the

ID 328:   Ekaterina Kurbatova
Road detection in aerial images based on color information and geometry features

ID 331:   Rinat Diyazitdinov
Iterative algorithm of optical triangulation sensors signals superposition for measuring solid deformation

ID 353:   Anton Kornilov, Ilia Safonov and Ivan Yakimchuk
Ring artifacts segmentation on microtomographic images by convolutional neural networks

ID 357:   Konstantin Kiy and Roman Dosaev
Global image analysis: detection and recognition of basic informative elements of road scenes

ID 398:   Elena Medvedeva and Elizaveta Varko
Image segmentation based on RGBD data

ID 662:   Aleksandr Shirokanev and Dmitry Kirsh
Study of the ambiguity problem of Bravais unit cell choice in three-dimensional crystal lattice identification task

Track 4: "Remote Sensing Image Analysis"

ID 115: Yurii Maglinets, Ruslan Brezhnev, Ksenia Raevich, Anna Pyataeva and Gennady Tsibulsky
The Scheme of Setting and Solving of Spatial Objects Monitoring Tasks

ID 229   Leonid Lebedev
Geometric aspects of the correlation-extreme methods of object recognition and compression of GSI

ID 231   Vitaliia Sviatkina, Vasiliy Rud and Vadim Davydov
Use of spectral analysis to control the distribution of energy of electromagnetic waves at radar station tracks

ID 430   Andrey Sosnovsky and Viktor Kobernichenko

Method of investigation of absolute phase recovery accuracy in InSAR data processing

ID 458   Maria Pavlova, Alexey Savchik, Lev Teplyakov, Mikhail Zagarev, Igor Kukoev and Anton Grigoryev

Agricultural parcel localization on satellite images using U-Net-based neural network

ID 550   Ivan Maslov and Oleg Goriachkin

Restoring the height of the terrain taking into account the statistical relationship of the interferometric pair of radar images

Method of investigation of absolute phase recovery accuracy in InSAR data processing

Section 3 "Mathematical Modeling of Physico-Technical Processes and Systems"

Track 1: "Physical processes and phenomena and technical systems"

ID 89:   Elena Shvareva, Leniza Enikeeva and Laysan Gabdrakhmanova
Harmony search algorithm for chemical kinetics optimization problems

ID 96:   Al'bina Ismagilova, Zulfiya Khamidullina and Semen Spivak
Decomposing a complex chemical reaction for determining parametric functions kinetic constants

ID 130:   Eldar Miftakhov, Svetlana Mustafina and Tatiana Mikhailova
Investigation of the effect of continuous operation of the polymerization process in the presence of Ziegler-Natta catalysts on the molecular characteristics of the product

ID 154:   Gulshat Mannanova and Gulshan Bikbova
Development of a 16-component kinetic model of catalytic cracking and solution of the inverse problem of kinetics on its basis

ID 161:   Diana Zigangirova and Svetlana Mustafina
Algorithms of direct simulation of chemical reaction under conditions of uncertainty of initial data

ID 163:   Evgenia Antipina, Svetlana Mustafina, Andrey Antipin and Sofia Mustafina
Solving the problem of planning a chemical experiment based on genetic algorithms

ID 167:   Elena Krivchenko, Alexander Nechaev, Yuri Moshchenskij and Olga Bogacheva
Mathematical model of the distribution of electrical and thermal energy in the working element of an information and measurement system designed to study the process of initiating industrial explosives

ID 211:   Liana Safiullina, Regina Mugalimova, Ravil' Zaynullin and Arslan Akhmetov
The study of the sensitivity of the kinetic parameters of catalytic reforming of gasoline

ID 299:   Anna Vovdenko, Mikhail Vovdenko, Kamila Koledina, Alfiya Bayguzina and Ravil Khusnutdinov
Modeling of the catalytic of benzyl and butyl alcohols etherification

ID 365:   Sergey Makhortov and Ilya Ivanov
Based on distributive lattice reasoning model in production zero-order logic

ID 424:   Irina Matveeva, Oleg Myakinin and Yulia Khristoforova

Monte Carlo simulation of Raman light scattering and Multivariate Curve Resolution – Alternating Least Squares (MCR-ALS) for determination of changes in skin tissue during the development of malignant neoplasms

ID 532:   Alexey Chernogor, Igor Blinkov and Alexey Volkhonskiy

Modelling of ceramic coatings grow during Arc-PVD deposition

ID 638:   Nikolay Yakimov, Aliya Khafizova, Oksana Dmitrieva and Ekaterina Artemeva

Simulation of gas outflow from the hole in long pipelines, operating under high pressure

ID 663:   Vadim Zinurov, Andrey Dmitriev and Vitaly Kharkov

Catching fine-dispersed particles in rectangular separator depending on different process parameters

ID 685:   Igor Kakorin, Olesya Kakorina and Irina Zaporotskova

Mathematical modeling of the process of interaction of sulfur dioxide with pyrolyzed polyacrylonitrile

ID 694:   Olga Permiakova, Andrey Miakonkikh, Konstantin Rudenko and Alexander Rogozhin

Ensemble Monte-Carlo simulation of resistive switching in HfO2/TaN/TiN stack

ID 724:   Alexander Sukhinov, Aleksandr Chistyakov, Inna Kuznetsova, Elena Protsenko and Asya Atayan

Modeling of soil dumping based on a modified Upwind Leapfrog difference scheme

ID 738:   Gulnaz Kildibaeva, Svetlana Mustafina, Albina Karamova, Sophia Mustafina and Oleg Larin

The analysis of the correctness of the mathematical model of chemical reactions based on the theory of bipartite graphs

ID 752:   Yuri Dimitrienko and Aydar Khuzin

Asymptotic modelling of heat and mass transfer in thin plates made of composite materials

ID 42:   Leniza Enikeeva, Marat Enikeev, Valentina Shamshovich and Radik Abutalipov

The gravity search algorithm for determining the optimal kinetic parameters of the reaction of low-temperature steam conversion of C2+ hydrocarbons

ID 290:   Ruslan Almakaev, Kamila Koledina and Sergey Koledin

Software complex for modeling and optimization of chemical processes kinetics

Track 2: "Technical systems and physical processes and phenomena"

ID 30:   Vladimir Nozhkin, Mikhail Semenov and Igor Ulshin

A stochastic model of the moisture motion in the atmosphere: two-dimensional case

ID 49:   **Sergey Makeev, Vladimir Kuptsov, Vadim Davydov and Valentin Dudkin**

The mathematical modeling of spectra of nuclear magnetic resonance signals for investigation of condensed media in express mode

ID 87:   **Innokentiy Semushin and Yulia Tsyganova**

State measuring set (data transferring channel) identification for stochastic and uncertain environments

ID 129:   **Alexander Hodakov, Vyacheslav Sergeev and Alexander Kulikov**

Modeling of thermoelectric processes in a powerful microwave MOSFET with a structural defect

ID 199:   **Natalia Voropaeva and Vladimir Sobolev**

Decomposition of PD-regulators design problem for systems with slow and fast modes

ID 214:   **Mikhail Semenov, Peter Meleshenko, Olga Reshetova and Andrey Solovyov**

Synchronization in the system of coupled van der Pol oscillators under hysteretic bonds: an analytic approach within the small parameter method

ID 268:   **Rinad Seidgazov and Fikret Mirzade**

Thermocapillary mechanism for recoil pressure creation on a metals in laser technologies with deep penetration

ID 305:   **Anastasia Kuvshinova, Andrey Tsyganov, Yulia Tsyganova and Hugo Ricardo Tapia Garza**

Algorithm for numerical identification of parameters for convective-diffusion transport model

ID 344:   **Vladimir Aslanov and Dmitry Sizov**

Chaotic motion of 3U Cubesat with deployable side panels

ID 358:   **Elena Klimanova and Alexander Maksimov**

Classification of mulidimentional element types in automatic regulation systems

ID 422:   **Elena Shchepakina**

Canard travelling waves in a reaction-diffusion model

ID 425:   **Elena Shchepakina**

Critical travelling waves in a flow reactor model

ID 521:   **Vladimir Sobolev**

Decomposition of travelling wave existence problem for singularly perturbed equations

ID 659:   **Oleg Kroytor, Mikhail Malykh and Leonid Sevastianov**

Modeling of seismic isolation support

ID 711:   Svetlana Kolesnikova and Vyacheslav Avramyonok

Application of a stochastic control method on manifold in an immunology problem

ID 721:   Yuliya Belova, Alexander Chistyakov, Anton Leontyev, Alena Filina and Alla Nikitina

Research the phytoplankton dynamics regimes depending on nutrient transformation processes in coastal systems

ID 722:   Alexander Sukhinov, Alla Nikitina, Alena Filina and Anton Leontyev

Multi-species model of interacting biological populations of shallow water

ID 723:   Sergei Zaitsev, Mikhail Semenov and Sergei Tikhomirov

Digital model of polymer molecules

ID 731:   Alexander Sukhinov, Aleksandr Chistyakov and Sofya Protsenko

Three-dimensional wave model in coastal marine systems for forecasting wave impact on shore protection and coastal structures

Track 3: "Information processes and physical processes and phenomena"

ID 33:   Andrey Tyugashev and Sergei Orlov

Ways of providing intelligent consistent real-time control for cyber-technical systems

ID 43:   Ishan Patel and Vladimir Aslanov

Active debris removal using electromagnetic induction

ID 55:   Roman Kovalenko, Alexander Tashlinskii and Mikhail Tsaryov

Deformation field estimate for image sequence by applying stochastic adaptation in the block method

ID 93:   Anton Doroshin

Conditions of implementing dynamical regimes with strange chaotic attractors in attitude dynamics of multi-rotor spacecraft

ID 103:   Leonid Korolev

Estimation of dynamically changing navigation parameters of the group of autonomous vehicles

ID 149:   Ilya Kuznecov, Anton Kuznecov, Igor Baclanov and Oleg Strashko

The stochastic model of search and detection of ground objects using unmanned aerial vehicles under conditions of irregular influence of the environment

ID 194:   Leonid Sinitsin and Andrey Kramlikh

Synthesis of optimal control law of the reorientation if the nanosatellite using procedures for analytic construction of optimal regulators

ID 232: **Alexandr Eryomenko and Anton Doroshin**

Reorienting nanosatellites to a predefined attitude using angular displacements of movable modules

ID 277: **Lenar Faizullin and Ruslan Pikalov**

The influence of the choice of the engagement point of the tether on the process of towing the space debris

ID 347: **Alexey Magazev and Valeriya Tsyrulnik**

Small perturbations of Markov models of cyber threats

ID 437: **Viktar Beliautsou, Alexandra Fedorova, Mikita Syrovatnikau and Vladimir Mokshin**

Development of an unmanned aerial vehicle stabilizing system with variable thrust vector

ID 474: **Vladimir Mochalov, Yuri Choni, Anatoliy Romanov and Igor Danilov**

Investigation of the potential characteristics of a satellite multi-beam hybrid-mirror antenna by modeling the process of adaptation to random deformations of the reflector

ID 527: **Yuriy Zabolotnov and Tatyana Ledkova**

Modeling and analysis of the motion of the space tethered system in a lunar orbit

ID 565: **Vladimir Aslanov and Alexander Ledkov**

Chaotic motion of a passive space object during its contactless transportation by ion beam

ID 582: **Igor Arkhipov, Yuri Shelkovnikov and Anastasia Meteleva**

The use of the spatial-structural model of a video signal from the television scanistor in the tasks of monitoring the geometric parameters of small objects

ID 600: **Alexander Ledkov**

Modeling the spatial motion of a space tether system with an inflatable balloon for raising payload orbit

ID 619: **Olga Starinova, Danhe Chen and Elizaveta Sergaeva**

Simulation of mission with low-thrust spacecraft to near-Earth asteroid

ID 674: **Vladimir Pankratov, Marina Barulina, Aleksey Golikov and Elena Pankratova**

Analysis of the possibility of deterministic chaos during the movement of an Earth remote sensing satellite with gyro dampers

ID 746: **Daria Zima, Alexander Spector and Darya Sokolova**

Spatiotemporal spectral analysis of signals and active interference in radar with digital antenna arrays

Track 4: "Technical systems and physical processes and phenomena"

ID 50: **Anna Mozhayko, Sergey Manninen and Vadim Davydov**

Modeling of physical processes of interaction of ultrasonic wave with metal structures for detection of defects

ID 63: **Vladimir Zelenskiy and Maxim Kapalin**

Modelling of the microelectromechanical system gyroscope's toothed resonator

ID 106: **Boris Kryzhanovsky and Leonid Litinskii**

Eigenvalue spectrum for Ising model on hypercube

ID 119: **Svetlana Novikova, Pavel Tutubalin, Alexander Snegurenko and Ruzilya Yakhina**

The optimal aircraft gas turbine engine control in low gas mode in the conditions of external additive noise

ID 183: **Yuriy Batov, Danila Puzko, Vadim Davydov and Alexander Petrov**

Comparison of methods for baseline determining of fluorescent detector signals of genetic analyzer

ID 372: **Valeriy Ermolaev, Yuriy Kropotov and Alexander Proskuryakov**

Modeling of neural systems and networks by functional differential equations

ID 410: **Andrey Tsyganov and Yulia Tsyganova**

Decentralized measurement data processing based on J-orthogonal transformations in a square-root information Kalman filter

ID 416: **Tatiana Kureneva, Andrey Tsyganov, Yulia Tsyganova and Natalia Volkova**

Square-root covariance filtering algorithm for discrete-time systems with multiplicative noises

ID 427: **Aleksey Golubkov, Andrey Tsyganov and Igor Petrishchev**

Detection of changes in the motion mode of an object moving along a complex trajectory

ID 482: **Ildar Badamshin**

The thermal conductivity and propagation velocity of oscillations modeling taking in single crystals into account the anisotropy of their properties

ID 505: **Anton Eremin**

Approximate analytical solution of the Graetz problem

ID 508: **Kirill Kazakov**

Modeling of the interaction of cylindrical bodies with complex surface properties

ID 531:   **Aleksei Taiurskii and Mikhail Gavrikov**

Influence of plasma inhomogeneity on process of Alfven wave nonlinear absorption by dissipative plasma with photorecombination radiation

ID 571:   **Pavel Ganin and Alexander Kobrin**

Modeling of the industrial manipulator based on PLC Siemens and Step Motors Festo

ID 587:   **Igor Blatov, Boris Likhttsinder and Elena Kitaeva**

On estimates of average queue length for queueing systems in the case of correlated input flow

ID 593:   **Alexey Dolgov, Igor Ishchuk and Valery Tyapkin**

Evaluation of qualitative indicators of the mathematical model of thermal tomograms construction based on the data of different time IR images

ID 644:   **Alexey Zhabin, Sergey Karamov and Alexey Krisilov**

Simulation of ultrashort pulse scattering by a conductive cylinder

ID 292:   **Boris Belyaev, Sergey Khodenkov, Natalya Shepeta and Dmitry Malyshev**

The investigation of ultra-wideband filter 3D model based on microstrip multimode resonators

ID 510:   **Irina Zaporotskova, Daniil Radchenko, Lev Kozitov and Natalia Boroznina**

Theoretical study of a metal composite based on a monolayer of pyrolyzed polyacrylonitrile containing paired metal atoms Cu-Co, Cu-Ni, Ni-Co, Ni-Fe

ID 611:   **Roman Okulov, Sergey Ilinykh, Mikhail Zakharov and Suleiman Akhmetshin**

Mathematical model of the process of the plasma pulverization of the rod electrode to produce of titanium powder

Section 4 "Data Science"

Track 1: "Humanities"

ID 127:   Vadim Moshkin, Ilya Andreev and Nadezhda Yarushkina
The sentiment-analysis algorithm of social networks text resources based on ontology

ID 145:   Alisa Makhmutova, Igor Anikin, Rifkat Minnikhanov, Tikhon Bolshakov, Maria Dagaeva and Kamil Mingulov
Detection of traffic anomalies for a safety system of smart city

ID 170:   Olga Kiryanova, Ilya Kiryanov, Bulat Kuluev, Aleksey Chemeris and Liana Akhmetzianova
The method of generation barcode for DNA certification of plants and organisms.

ID 306:   Kamila Fatkhutdinova, Alexey Vulfin, Vladimir Vasilyev, Andrey Nikonov and Anastasiya Kirillova
Intelligent emotion recognition system in neural network basis

ID 307:   Valentina Burmistrova, Alexander Butov, Maksim Volkov, Mariya Gavrilova, Sergey Hrustalev, Boris Kostishko and Alexander Shabalin
Methods of researching processes with various types of compensation of the change-point

ID 309:   Arina Startcseva, Alexey Vulfin, Vladimir Vasilyev, Andrey Nikonov and Anastasiya Kirillova
Bank transaction text label mining algorithms

ID 409:   Igor Genrikhov and Elena Djukova
Finding frequent elements for a product of partial orders and association rules

ID 498:   Anton Romanov and Aleksey Filippov
Approach to data-driven enterprise decision-management

ID 675:   Mikhail Abramyan, Boris Melnikov, Anastasia Nichiporchuk and Marina Trenina
Application of artificial intelligence in the branch and bound method on the example of various applied problems

ID 783:   Olga Medvedeva, Sofya Mustafina, Alia Nurgalieva and Shoabbos Ibragimov
Augmented Reality Mobile apps Development with Unity and Vuforia SDK

ID 763:   Dmitry Vasin, Vladimir Gromov, Sergey Romensky and Sergey Rotkov
Automated technology for converting paper-based design documentation into an electronic 3D model of an object

ID 769:   Dmitry Gorbachev

Evaluating the relevance of the elements of distributed computing system infrastructure when solving tasks in managing an economic unit

Track 2: "Methods, Algorithms and Technology Platforms"

ID 8:   Dmitry Zybin, Ksenia Burkova, Andrew Kalach and Eugeniy Govorin

Conceptual model for multidimensional presentation of empirical data on the state of critical information infrastructure facilities

ID 15:   Danil Dayneko, Diana Bakhteeva, Dmitriy Zybin, Vladimir Spirin and Andew Kalach

The current status of sensitive information leaks through cloud storage

ID 196:   Elena Basan and Alexander Basan

The Problem of Assessing Information Security Risks for Robotic Systems: A Literature Review and Methodology of Estimating Initial Protection

ID 259:   Vitalii Dementev and Artem Artemev

Generative deep Gaussian processes

ID 310:   Marina Nikitina

Structural-parametric Model of Healthy Diet

ID 332:   Nikita Andriyanov

Comparative analysis of football statistics data clustering algorithms based on deep learning and Gaussian mixture model

ID 334:   Basim Salem and Vladimir Solodovnikov

Data visualization and clustering in the task of system analysis of the patients examination results in the initial stages of cognitive impairment

ID 343:   Vitalii Dementev and Alexander Tashlinskii

The use of stochastic parameter identification in the separation of mixtures of correlated deep Gaussian models

ID 580:   Galina Rybina, Alexander Slinkov and Dmitry Buyanov

Experimental software modeling of knowledge acquisition processes for automated knowledge bases construction in dynamic integrated expert systems

ID 603:   Svetlana Korabelshchikova

An extension of the class of Boolean functions used in symmetric cipher algorithms

ID 727:   Tatiana Afanasieva, Irina Moshkina and Vadim Tronin

Descriptive model of local and global features multivariate time series based on fuzzy tendency

ID 116:   Zaur Shibzukhov, Mukhamed Kazakov and Dmitriy Dimitrichenko

Robust k-means method based on minimizing differentiable mean estimates that are insensitive to outliers

ID 526:   Maxim Polyakov, Alexander Khoperskov and Egor Borisovskii

The use of machine learning to improve the effectiveness of diagnostics in medicine based on the method of radiothermometry

ID 10:   Alsu Nurutdinova and Sergei Shalagin

Identification of Markov sequences based on a modified "Forward-Backward" algorithm

ID 335:   Van Vinh Dang, Nataliya Dodonova, Mikhail Dodonov and Svetlana Korabelshchikova

Some applications of binary lunar arithmetic

Track 3: "Artificial Neural Networks and Applications"

ID 9:   Ekaterina Zguralskaya, Nikolay Ignatev and Maria Markovtseva

Nonlinear transformation of signs and the search for patterns in the data of patients with chronic lymphocytic leukemia

ID 36:   Vitalii Dementev, Konstantin Vasiliev and Alexey Belyanchikov

Application of image processing methods in communication systems with OFDM

ID 134:   Alexey Olshansky, Yefim Rozenberg, Alexander Ignatenkov, Ignat Dovgerd, Gleb Dovgerd and Paul Ignatenkov

Some approaches of improving the quality of artificial neural networks training

ID 197:   Mikhail Leontev, Alexander Miheev, Kirill Sviatov and Sergey Sukhov

Quality metrics of variational autoencoders

ID 216:   Anton Agafonov and Alexander Yumaganov

Traffic flow prediction using graph neural networks

ID 279:   Alexandra Makarova, Mikhail Kurbakov and Valentina Sulimova

Mean Decision Rule method for constructing nonlinear boundaries in solving large two-class SVM problems

ID 318:   Andrey Chekin and Aleksey Kukovinets

Simulation of four-wheel robot chassis taking into account contact interaction

ID 388:   Alexey Borisov and Evgeny Myasnikov

Implementation of "Magma" and "Kuznyechik" ciphers using HIP

ID 360:   Oksana Mandrikova and Nadezhda Fetisova

An automated method for detecting ionospheric disturbances

ID 436:   Vladimir Mokshin, Nikita Stadnik, Daria Maryasha, Alexander Zolotukhin and Leonid Sharnin

Modified genetic algorithm as a new approach for solving the problem of three-dimensional packing.

ID 625:   Maria Pushkareva, Emil Khayrov and Iakov Karandashev

Post-training quantization of neural network through correlation maximization

ID 681:   Alexander Krochin

Use of free software packages to improve visual data presentation by transform into U3D or PRC formats

ID 336:   Vladimir Geppener and Bogdana Mandrikova

Analysis of cosmic ray variations according to the global network of neutron monitors

Track 4: "Machine Learning and Data Analysis"

ID 54:   Evgeny Sagatov, Samara Mayhoub, Andrei Sukhov and Maksim Baymyashkin

Development of methods and means of counteracting the initial stage of network intrusion

ID 148:   Aleksei Gladkii and Danila Shkirdov

IoT honeypot design for attack strategies

ID 337:   Nikita Morunov and Dimitry Golovashkin

Performing of the FDTD method calculations on Supercomputer "Sergey Korolev" GPUs via MATLAB language

ID 370:   Daria Makienko, Ilya Seleznev and Ilia Safonov

The effect of the imbalanced training dataset on the quality of classification of lithotypes via whole core photos

ID 463:   Dimitry Golovashkin, David Kalachian and Liudmila Yablokova

Investigation of the possibility of constructing a block algorithm of the BPM method

ID 777:   Vladislav Pshenin and Pavel Yakimov

Platform for creating a digital profile of visitors based on face images

ID 789:   Egor Ershov, Alexander Belokopytov and Alexey Savchik

Problems of dataset creation for light source estimation

ID 794:   Yann Donon, Alexander Kupriyanov and Rustam Paringer

Brightness normalization for Blurred Image Matching

ID 795:   Yann Donon, Alexander Kupriyanov, Rustam Paringer, Igor Rytsarev, Alberto Di Meglio, Sergey Syomik, Dmitriy Kirsh and Pavel Serafimovich

Anomaly detection and breakdown prediction in RF power source output: extended research

Posters

Section 1 " Computer Optics and Nanophotonics"

Track 1: "Beams"

ID 20:   Tatiana Plastinina
Modeling the formation of non-diffraction parabolic beams

ID 31:   Andrey Ustinov
Peculiarities of the generalized and fractional parabolic beams

ID 41:   Mikhail Bretsko, Yana Akimova, Yuriy Egorov, Alexander Volyar and Victor Milyukov
Vortex spectrum of perturbed singular beam and informational Shannon entropy

ID 47:   Yuriy Egorov, Mikhail Bretsko, Yana Akimova and Alexander Volyar
Features of the fine structure of asymmetric TE and TM modes

ID 57:   Oleg Osipov, Dmitry Mishin, Dmitry Panin and Igor Matveev
Investigation of the reflection of plane optical waves from an inhomogeneous nonreciprocal chiral media

ID 75:   Sergey Lishaev
Investigation of iterative calculation of diffraction-free beams with a given distribution

ID 76:   Evgeny Monin
Comparative study of propagation of Gauss-Laguerre beams and circular Airy beams in a parabolic fiber

ID 82:   Ilya Rodin
Modeling and researching of propagation of Airy and Pearcey beams

ID 110:   Pavel Khorin
The formation of diffraction-free beams with a given distribution based on the Whittaker integral

ID 165:   Victor Kotlyar, Alexey Kovalev and Darya Kalinkina
Spin angular momentum and energy flow density in the sharp focus of a light field with an optical vortex and polarization singularity on the optical axis

ID 206:   Pavel Mokshin, Sergey Kharitonov and Svetlana Khonina
The operation modeling of spectral filters of the THz range using vector Bessel beams

ID 245: **Sergey Stafeev, Elena Kozlova, Anton Nalimov and Victor Kotlyar**
Tight focusing of cylindrical vector beam by gradient index lens

ID 246: **Sergey Stafeev and Victor Kotlyar**
Behaviour of transverse Poynting vector components in the vicinity of tight focus

ID 338: **Mariia Zablovskaia**
Transformation of light beams using waveguides

ID 561: **Sergey Volotovskiy**
Algorithm for approximating a beam with a given intensity by Hermite-Gaussian modes

ID 717: **Alexey Dzyuba**
Calculation and research of point spread function in apodized optical system in order to compensate defocus

ID 40: **Yana Akimova, Mikhail Bretsko, Yuriy Egorov, Alexander Volyar and Victor Milyukov**
Digital sorting of perturbed Laguerre-Gaussian modes by radial index

Track 2: "Plasmons and metamaterials"

ID 11: **Safaa Mohammed Ridha Hussein Hussein, Muthana Alboedam and Vasiliy Gavrilov**
Study the properties of conductivity in two-layer graphene using mathematical modeling

ID 13: **Sergey Kharitonov, Safaa Hussein, Ann Frize and Nikolay Kazanskiy**
Calculation of the band structure of an array of spherical quantum dots

ID 61: **Mikhail Evseev, Eugene Bashkirov, Ali Othman and Anna Gorchakova-Zakatova**
Entanglement in two-atom Jaynes-Cummings model with Kerr nonlinearity

ID 64: **Maria Buzaeva, Irina Makarova and Vyacheslav Sergeyev**
Dispersion systems with multi-walled carbon nanotubes in a polymer binder

ID 70: **Alexander Gorokhov**
Coherent states and control of molecular dynamics

ID 107: **Hanh Hong Mai**
The influence of precursor concentration on the crystallinity and morphology of ZnO nanorods grown on printed circuit board substrate

ID 142:   Shostka Vladimir, Shostka Nataliya, Vershitsky Vladislav and Khalilov Server
Structural features of the near-surface layers of highly dilute aqueous solutions

ID 230:   Dmitry V. Nesterenko, Roman A. Pavelkin, Shinji Hayashi and Victor Soifer
Asymmetric resonances and field enhancement of hybrid plasmon-waveguide modes in CdTe structures

ID 261:   Fikret Mirzade and Rinad Seidgazov
Combined effects of surface elasticity and strain gradient on the instability of laser-excited films with nanoscale thickness

ID 266:   Dmitrij Belousov
Analysis of the ordering and area of defects of the TLIPSS structures formed on thin Hf films by astigmatic Gaussian beam

ID 342:   Mikhail Evseev and Eugene Bashkirov
Dynamics of entanglement of two superconducting qubits nonresonantly interacting with two independent resonators

ID 460:   A. Bugaev
Resonant nanophotonics structures for analog optical computing

ID 734:   Sergey Volchkov, Leonid Kochkurov and Dmitry Zimnyakov
Effective dielectric function of semiconductor particles under intense laser pumping

ID 802:   V.P. Korol'kov, D.A. Belousov
Nanotechnology for diffraction optics

ID 803:   M.R. Duparre
In memory of professor Mikhail Aronovich Golub

Track 3: "Sensors and optical devices"

ID 51   Andrey Mezhenin and Timur Gruzdev
The use of diffractive optical elements for laser cutting of sheet cardboard

ID 81:   Stanislav Sergunin and Станислав Краснов
Focusing of pulsed laser linearly polarized Gaussian beams using refractive microaxicons

ID 105:   Gregory Pchelkin, Varvara Fadeenko and Vadim Davydov
Multifunctional fiber-optic system for transmitting microwave signals in the frequency range from 0.135 to 40 GHz

ID 112: **Semen Logunov, Vadim Davydov, Nikita Myazin and Vasiliy Rud**

Development of an optical imaging system to study the parameters of a magnetic track from a moving object

ID 178: **Michael Osipov and Roman Sergeev**

Analysis image formation in double exposure speckle photography

ID 189: **Alexey Raku, Alexander Degtyarev, Alexander Shirokanev, Aliona Kibitkina, Nataly Ilyasova and Andrey Zolotarev**

Study of the thermal field of the retina of the Human eye in the laser exposure zone during numerical simulation based on the solution of the heat equation in the layered region

ID 240: **Alexey Porfirev and Anna Dubman**

Advanced photophoresis-based laser trapping in air

ID 248: **Hanh Hong Mai**

New construction design of a fluorescent imaging filter set based on TiO2/SiO2

ID 255: **Alexey Dzyuba, Sergey Popov and Pavel Serafimovich**

Phase apodization of imaging system in separate color channels for extending depth of field

ID 301: **Robert Bielak, Serguei Murzin, Gerhard Liedl, Andreas Otto and Nikolay Kazanskiy**

Modeling of temperature fields in DP1000 steel during laser treatment using diffractive optical elements

ID 323: **Anastasia Shatskaya and Dmitry Artemyev**

Human skin model for spatially-resolved fluorescence registration using different fiber optic system configuration

ID 324: **Roland Fuerbacher, Gerhard Liedl and Serguei Murzin**

Investigations on the spatial frequency transition of Laser induced periodic surface structures

ID 352: **Serguei Murzin, Andrey Tisarev and Maksim Blokhin**

Calculation of thermal processes during laser treatment of dual phase steel using element of diffractive computer optics

ID 368: **Anton Krents, Nonna Molevich and Liza Yarunova**

Optical extreme events in laser with optoelectronic feedback

ID 383: **Elizaveta Grakhova, Guzel Abdrakhmanova, Arsen Ishmiyarov, Irina Vinogradova, Ivan Meshkov, Albert Sultanov, Valeriy Bagmanov and Azat Gizatulin**

Development of a beam-forming circuit for an antenna array operating in the W-band

ID 404: **Lyudmila Bratchenko, Ekaterina Abrosimova, Sergey Stafeev, Elena Tupikova, Ekaterina Borisova and Ivan Bratchenko**

Conventional Raman and surface-enhanced Raman spectroscopy for human skin components analysis

ID 435: **Serguei Murzin, Nikolay Kazanskiy, Gerhard Liedl, Robert Bielak, Alexey Melnikov and Stanislav Osipov**

Study of structure of dual phase steel after laser heat treatment using moving distributed surface heat sources

ID 548: **Muslim Gubaev and Sergey Degtyarev**

Calculation of the rays path in an axicon with a small opening angle

ID 568: **Margarita Rodionova**

Ultracompact imaging spectrometer based ring type structures

ID 607: **Denis Praporshchikov, Daria Ivanova, Maria Ivanova, Anton Bourdine and Vladimir Burdin**

Potential opportunities of axial mismatch in input attachment unit of few-mode reflectometers

ID 646: **Kirill Volkov, Vladimir Burdin, Anton Bourdine, Oleg Delmukhametov and Evgenia Eremchuk**

Model based on Prony decomposition for mode coupling of optical fibers of a cable delivery length

ID 729: **Ekaterina Ushakova, Alexander Dorogov and Dmitry Zimnyakov**

Low-coherence reflectometry of random media: basis approaches to data processing

ID 748: **Albert Mingazov, Leonid Doskolovich, Dmitry Bykov and Evgeni Bezus**

Optimal mass transportation problem in the design of freeform optical elements generating far-field irradiance distributions for plane incident beam

ID 749: **Albert Mingazov, Leonid Doskolovich and Dmitry Bykov**

The two reflector design problem for forming flat wavefront from a point source

ID 796: **Vladimir Lukin**

Adaptive correction of the image of an incorrect source-object

Track 4: "Diffractive optics, Holography, Spectroscopy"

ID 157: **Kseniya Gosteva, Sergey Degtyarev and Elizaveta Shuvatova**

Optical Image Spectral Filtering Algorithms

ID 466:   V.A. Danilov

[60 years of S. G. Volotovsky](#)

ID 467:   V.A. Danilov

[To the 75th anniversary of S. B. Odinokov](#)

ID 470:   V.O. Sokolov

[To the 50th anniversary of prof.V.S. Pavelyev](#)

ID 476:   Denis Kudryashov

[Tools for promoting a scientific paper on the example of the journal "Computer Optics"](#)

ID 570:   Anton Khokhlov

[Modeling the image obtained by a system of vortex harmonic lenses](#)

ID 595:   Yaroslav Skidanov

[Forming an image of an object from several sources with different phase and coherence](#)

ID 667:   Pavel Khanevich and Dmitry Kuzmin

[Investigation of the contact copy method for recording Bragg diffraction gratings in photothermal refractive glasses](#)

ID 668:   Dmitry Kuzmin and Pavel Khanevich

[Investigation of the parameters of the angular and spectral selectivity of Bragg diffraction gratings in photo-thermo-refractive glasses](#)

ID 680:   Al'Bert Sultanov

[Vortex optics](#)

ID 682:   Vladimir Andreev

[Optimal bases in optical applications](#)

ID 716:   S.B. Odinokov, G.I., Greisukh, G.G. Levin

[Digital holography: from a mathematical idea to actual computer optics applications](#)

ID 733:   Valery Khonin

[Modeling an optical correlator for visualizing phase objects](#)

ID 735:   Matvey Svetlov and Denis Boldyrev

[Formation of random fields using the Karhunen-Loeve expansion](#)

ID 758:   V.A. Danilov

[Focusing DOEs (focusators): design and investigation](#)

ID 242:   **Alexey Porfirev, Georgy Gridin and Valentin Logachev**

Investigation of properties of nonlinear spiral phase plates

Section 2 " Image Processing and Earth Remote Sensing"

Track 1: "Image Processing"

ID 46:   Anna Egorova
The effectiveness of image filtering by superpixel representation

ID 62:   Vladimir Chernov
Discrete orthogonal transforms with self-similar basis functions

ID 74:   Yuliya Vybornova and Aleksey Maksimov
A comparative study of restoration techniques for images defined by chaotically scattered point set

ID 80:   Aleksey Maksimov and Mikhail Gashnikov
Differential method of multidimensional signals compression based on the adapted parameterized interpolation algorithm

ID 94:   Anatoly Novikov and Anton Pronkin
Method and program for detecting borders of brightness difference

ID 117:   Nikolay Glumov and Mikhail Gashnikov
Algorithm for optimizing quantization scales by an arbitrary quality measure

ID 122:   Anna Egorova, Victor Fedoseev
Semi-fragile watermarking algorithm for H.264 video protection

ID 124:   Olga Omelchenko and Victor Fedoseev
A method for protecting images from changes with informative fragment recovery option

ID 125:   Evgeny Myasnikov
Hyperspectral data dimensionality reduction using nonlinear autoencoders

ID 132:   Vladislav Butorov and Marina Chicheva
Research of lossy image compression algorithm based on fractal discrete cosine transform

ID 141:   Mikhail Gashnikov
Adaptive interpolation for heterogeneous multidimensional signals fusion

ID 308:   Andrey Kuznetsov and Artem Lanin
Splicing detection based on improved FISH descriptors

ID 405:   Irina Gndoyan, Alexey Petraeyvsky, Victor Fedoseev and Maria Denisenko
Determination of quantitative and qualitative indicators of hemomicrocirculation of the anterior eye segment according to the results of non-invasive application fluorescein angiography

ID 581: **Ivan Kholopov and Igor Kudinov**

Scene-based non-uniformity fixed pattern noise correction algorithm for infrared video sequences

ID 612: **Roman Kovalenko, Pavel Smirnov and Radik Ibragimov**

Use of stochastic adaptation in block method to estimate deformation field for image sequence

Track 2: "Image Analysis"

ID 84: **Yuliya Podgornova and Sultan Sadykov**

Increasing the contrast of mammograms containing breast cancer regions on the background of fat involution using wavelet transformations

ID 159: **Nikita Demin, Nataly Ilyasova, Aleksandr Shirokanev and Evgeniy Zamyckij**

Segmentation of OCT images for localizing of diabetic macular edema

ID 192: **Vladimir Grishanov, Igor Malov, Georgiy Pleshakov and Seda Gevorkyan**

Parameterization of fluorescent images of external tissues of the body for diagnostic purposes

ID 195: **Aleksandr Borodinov and Vladislav Myasnikov**

Pairwise comparisons in finding user preferences

ID 226: **Artem Mukhin, Igor Kilbas, Rustam Paringer and Nataly Ilyasova**

Application of the gradient descent for data balancing in diagnostic image analysis problems

ID 235: **Ekaterina Galitskaya and Viktor Krasheninnikov**

Ways to increase the probability of correct recognition of noisy speech commands by their cross-correlation portraits

ID 271: **Konstantin Dobratulin, Andrey Gaidel, Irina Aupova, Anna Ivleva, Aleksandr Kapishnikov and Pavel Zelter**

The efficiency of deep learning algorithms for detecting anatomical reference points on radiological images of the head profile

ID 280: **Maksim Baranov and Tristan Malleville**

Determination of the structures contours parameters in biological films for the development of the cuneiform dehydration method

ID 314: **Nikita Andriyanov and Danila Andriyanov**

The importance of data augmentation in machine learning for image processing tasks in the face of data scarcity

ID 320: **Nikita Andriyanov**

Using neural networks to identify parameters of autoregression model with multiple roots of characteristic equations

ID 325: **Radik Magdeev, Marat Suetin and Aleksandr Tashlinskii**

Improving the efficiency of the method of stochastic gradient identification of objects in binary and grayscale images due to their pre-processing

ID 397: **Vladimir Panishchev and Sergey Poltoratskiy**

Hardware-oriented algorithm for extracting periodic sequence of digital signals

451 **Dmitry Murashov, Yury Obukhov, Ivan Kershner and Mikhail Sinki**

Algorithm for identifying artefact events based on the analysis of video EEG data for monitoring patients with craniocerebral injuries

ID 469: **V.O. Sokolov**

75 years of prof. V.A. Fursov

Track 3: "Computer Vision"

ID 48: **Evgeny Myasnikov**

Assessment of camera orientation in Manhattan scenes using information from optical and inertial sensors

ID 58: **Vladislav Myasnikov and Alexander Verichev**

Image Inpainting as a Quadratic Programming Task

ID 60: **Yulia Ganeeva and Evgeniy Myasnikov**

Iris segmentation in an image using a convolutional neural network architecture U-Net

ID 253: **Alexey Ruchay, Konstantin Dorofeev and Vsevolod Kalschikov**

Accuracy analysis of 3D object reconstruction using mesh filtering

ID 438: **Lubov Shiripova, Olga Strukova and Evgeny Myasnikov**

Study of classification techniques for PCA-based human action recognition

ID 471: **Ilya Kolobov, Alexander Korobeynikov and Alexander Lozhkin**

The microcircuit images analysis based on convolutional neural network

ID 645: **Aleksandra Danilenko and Anastasia Guzhenko**

Use of convolution networks to solve the problem of detection and recognition of state registration signs of vehicles

ID 741: **Arseny Golovin, Anatoly Demin and Evgenii Sechak**

Landmine detection and minefield mapping with the help of multi-angle long-wave infrared hyperspectral data fused with the 3D terrain reconstruction

ID 742:   Andrey Meshcheryakov and Sergei Popov
Using of deep convolutional neural networks for visual features extraction in multiple objects tracking task

Track 4: "Remote Sensing and Geospatial Analysis"

ID 164:   Olga Belova, Natalia Vlasova, Ludmila Kavelenova, Eugene Korchikov, Victor Fedoseev, Tatiana Chap and Anna Denisova
Monitoring of the recreation effects on land cover with the use of an unmanned aerial vehicle on the example of the Strelnaya mountain in Samara region

ID 204:   Natalia Rodionova, Irina Vakhnina and Tatiana Zhelibo
Assessment of vegetation state post-fire dynamics on the territory of Ivano-Arakhleisk natural Park (Zabaikalsky Krai) by Sentinel 1/2 radar and optical data

ID 210:   Alina Bavrina, Ludmila Kavelenova, Oksana Kuzovenko and Nataly Prokhorova
Detection and age estimation of burned areas of natural grassy communities in the Samara region using Sentinel-2 data

ID 278:   Nina Vinogradova, Andrey Sosnovsky and Natalya Sevostyanova
Automatic recognition of the number of channels in unidentified multispectral data

ID 281:   Nina Vinogradova and Leonid Dorosinsky
Research of algorithms for detecting small changes over the data of a radar image of the Earth from space

ID 288:   Nina Vinogradova, Andrey Sosnovsky and Stepan Egorov
Analysis of the accuracy of determining the vegetation edges according to the Landsat remote sensing data over the territory of the Sverdlovsk region

ID 327:   Nikita Andriyanov and Danila Andriyanov
Modeling and processing of SAR images

ID 406:   Sergey Zraenko
Increasing the distinctiveness of forest species composition by satellite images

ID 448:   Vadim Turlapov, Tamara Utesheva and Konstantin Pukhky
The task of detecting the boundaries of hyperspectral image objects

ID 519:   Vladislav Batshev, Milana Sharikova, Alexander Machikhin, Sergey Boritko, Vitold Pozhar, Alexey Kozlov and Anton Karandin
A compact acousto-optical module for hyperspectral imaging systems

ID 728:   Dmitry Gavrilov and Dmitry Lovtsov

Processing of visual information in the automated optoelectronic system of ground-space monitoring

ID 215:   Anton Agafonov, Aleksey Maksimov and Aleksandr Borodinov

Performance comparison of GPU parallelization algorithms for the reliable shortest path problem

ID 506:   Aleksandr Borodinov and Vladislav Myasnikov

Analysis of user tracks on public transport

Section 3 "Mathematical Modeling of Physico-Technical Processes and Systems"

Track 1: "Physical processes and phenomena and technical systems"

ID 3:   Mikhail Balabaev and Vladimir Sobolev
Phase flows geometry of autonomous dynamical models with singular perturbations

ID 16:   Michael Bolotov, Vadim Pechenin, Ekaterina Pechenina and Nikolaj Golev
Digital model of aircraft engine compressor rotor assembly optimization

ID 17:   Vladislav Lyubimov and Svetlana Kuznecova
Application of the method of integral manifolds to obtain low-frequency equations of motion of an asymmetric probe in the rarefied atmosphere

ID 38:   Tatiana Shlyakova
Sound signal analysis using Morlet wavelet

ID 39:   Sergey Novikov and Mariya Fedina
On some problems and solutions in frame theory

ID 121:   Dmitriy Novomeyskiy and Mikhail Piganov
Mathematical model of the interaction of a torch discharge with film elements

ID 131:   Michael Bolotov, Vadim Pechenin, Nikolay Ruzanov and Iliya Grachev
Information model and software architecture for the implementation of the digital twin of the turbine rotor

ID 138:   Arina Enikeeva and Ruslan Pikalov
The influence of climber motion on the dynamics of the orbital space elevator

ID 187:   Ravil Uzyanbaev and Regina Yusupova
Mathematical modeling of mass-heat transfer processes on the grain of a catalytic cracking catalyst

ID 190:   Gulshan Bikbova, Gulshat Mannanova and Irek Gubaydullin
Review of catalysts of catalytic cracking process and analysis of possibility of their calculation by universal kinetic model

ID 203:   Elena Shchepakina and Elena Tropkina
Order reduction for problems on travelling waves solutions to reaction-diffusion systems

ID 241:   Albina Karamova
Program for modeling the kinetics of chemical reactions in the cascade of reactors

ID 263: Andrei Pavelev and Vitalii Semin

Application of stochastic calculus for some classes of quantum models

Track 2: "Technical systems and physical processes and phenomena"

ID 264: Ekaterina Serikova, Vladislav Kalaev and Olga Serikova

Using ROC analysis to confirm an algorithmically established diagnosis of lichen planus

ID 269 Yuriy Vashukov

Mathematical modeling of hole formation with reinforcement in composite construction

ID 270: Klara Gabdrahmanova, Gulnara Izmailova and Lilia Samigullina

Mathematical modeling of geothermal energy extraction process by means of a well

ID 282: Valery Kondrashchenko, Sergey Titov and Mong Thu Tran Thi

Mathematical model of a concrete mix rotational seal

ID 283: Vladimir Jordan, Igor Shmakov and Angelica Grigoryevskaya

Software implementation of the 3D-simulation procedure of SHS macrokinetics in the Ni-Al porous model medium with the closest packing of "mesocells"

ID 287: Aleksey Utkin, Albert Gareev and Asgat Gimadiev

Diagnostic method of a coil heat exchanger efficiency based on thermal and hydrodynamic processes modelling

ID 293: Angelica Grigoryevskaya, Pavel Gulyaev, Vladimir Jordan and Igor Shmakov

Spin instability criteria based on parametric identification of the node distribution in Trace transform direct image of the SHS combustion wave chronogram

ID 294: Valery Berdnikov and Yakov Mostovoy

Analytical and numerical modeling of the formation of a programmable percolation route in the planning of two-phase operations

ID 295: Valery Berdnikov and Yakov Mostovoy

Modification and training of ant algorithm for planning swarm operations of moving objects

ID 302: Valentina Burmistrova, Alexander Butov, Maksim Volkov, Mariya Moskvicheva, Yuliya Pchelkina, Boris Kostishko and Marina Yavtushenko

The change in the probability of aviation accidents "Collision of an aircraft with a bird" in accordance with of a change in the temperature cycle

ID 340: Larisa Stepanova and Ekaterina Mironova

Asymptotic stress fields near the crack tip in perfect plastic materials under mixed mode loading (plane strain conditions)

ID 351:   **Alexander Chekashov and Andrey Kramlikh**

Research of optimality of the nanosatellite nominal reorientation trajectory

ID 366:   **Anastasia Peksheva and Larisa Stepanova**

Mixed mode fracture in perfect plastic materials for plane stress conditions

Track 3: "Information processes and physical processes and phenomena"

ID 418:   **Valery Bogdanovich and Mikhail Giorbelidze**

Mathematical modeling of features of heating of a cylindrical surface at plasma spraying

ID 419:   **Andrey Agafonov, Ksenia Milanina, Anatolii Eremin and Vasiliy Gavrilov**

Application of molecular dynamics for modeling processes in microfluidic devices

ID 455:   **Dmitriy Ivanov and Aleksandr Zhdanov**

Numerically stable algorithm for identification of linear dynamical systems by extended instrumental variables

ID 459:   **Andrey Dmitriev, Ilnur Madyshev, Aliya Khafizova and Andrey Nikolaev**

Hydrodynamics in counterflow cooling tower with corrugated inclined contact elements

ID 472:   **Tatiana Mikhailova, Eldar Miftakhov, Vladimir Mikhailov and Sofia Mustafina**

About an algorithm for modeling the isoprene polymerization process in the cascade of reactors using the Monte Carlo method

ID 499:   **Victor Ryazhskikh, Alexander Nikolenko and Dmitry Konovalov**

On the structure of the orthotropic 3D permeability tensor of an anisotropic porous body in heat and mass transfer problems

ID 500:   **Vladimir Aslanov and Daria Andrievskaia**

Delivery of a returned container from the surface of Phobos using electrostatic forces

ID 553:   **Oleg Krol, Volodymyr Sokolov, Petko Tsankov and Olexandr Logunov**

Modelling of machining center vibration stavility by the D-partitions method

ID 572:   **Sergey Volgin, Maksim Ivanushkin and Ivan Tkachenko**

Modelling of onboard systems operation of small satellites based on general logical-probabilistic method

ID 574:   **Iliya Grachev, Michael Bolotov, Vadim Pechenin and Evgeny Kudashov**

Comparative analysis of simulation options for the real geometry of the surfaces of gas turbine engine parts

ID 594: **Vadim Salmin, Vladimir Kurenkov, Sergey Safronov, Ivan Tkachenko, Artem Yakischik, Maksim Ivanushkin, Sergey Volgin and Anastasiia Krestina**

Development of tools for computer-aided engineering and simulation of the remote sensing satellite systems, taking into account the requirements and limitations on customer resources

ID 640: **Elena Demyanenko, Anastasia Kosolapova and Igor Popov**

Modeling of the process of plastic deformation as applied to thin-walled shells of the type of bottoms

ID 672: **Vadim Zinurov, Nailya Dubkova, Oksana Popkova and Oksana Dmitrieva**

Influence of separation elements shape on device efficiency

ID 691: **Andrey Parfiriev, Oksana Parfirieva and Igor Ishchuk**

Quadcopter directorial control algorithm with the possibility of flying around obstacles

ID 710: **Irina Papkova**

On a static solution to the contact interaction of a flexible rectangular in plane of a microshell with a rectangular in plane of microplate

Track 4: "Technical systems and physical processes and phenomena"

ID 712: **Evgeniya Tsarkova, Alexandr Belyaev and Elena Andreeva**

Research of the mathematical model of the immune system

ID 754: **Vadim Salmin and Alexey Chetverikov**

Algorithm for narrowing of the region of the final trajectory parameters deflection during the flight to geostationary orbit with low thrust engines

ID 757: **Vadim Salmin, Konstantin Peresypkin, Alexey Chetverikov and Ivan Tkachenko**

Determination initial approximation in solving the problem of numerical optimization of a large-sized space structure using linear extrapolation of optimal solutions

ID 767 **Aurthur Vimalachandran Thomas Jayachandran, Andrey Tkachenko, Hewa Hussein Omar and Krishnakumar Aruljothi**

Performance computing of an open cycle micro gas turbine powerplant using data aided modeling and simulation.

ID 768: **Aurthur Vimalachandran Thomas Jayachandran, Andrey Tkachenko, Krishnakumar Aruljothi and Hewa Hussein Omar**

Modeling and parametric optimization for a solar-powered closed-cycle micro gas turbine for space applications.

ID 770: **Vadim Krysko**

Nonlinear dynamics rectangular in plan nanoshells

ID 771:   Hewa Hussein Omar, Venedikt Kuz'michev, Andrey Tkachenko and Aurthur Vimalachandran Thomas Jayachandran

Development of a mathematical model of the compact heat exchanger used for optimizing thermodynamic parameters of the aviation gas turbine engine

ID 772:   Valentina Burmistrova, Alexander Butov, Boris Kostishko and Marina Yavtushenko

The problem of optimal control of the intensities of processes with change-point

ID 773:   Vladimir Volotsuev

A digital model of the density of the earth's residual atmosphere for ballistic analysis in the design of low-orbit spacecraft

ID 779:   Larisa Stepanova

A photoelastic and finite element study of the stress field in the vicinity of two interacting cracks: stress intensity factors, T-stresses and higher order terms

ID 781:   Larisa Stepanova and Oksana Belova

Determination of the higher-order coefficients of the Williams asymptotic expansion for notched semidiscs using the photoelasticity method and finite element analysis

ID 790:   Hewa Hussein Omar, Venedikt Kuz'michev and Andrey Tkachenko

Optimization of the parameters of the working process of aviation turbofan engines with heat recovery

ID 805:   Elena Shchepakina

Order reduction for critical travelling waves problems

Section 4 "Data Science"

Track 1: "Humanities"

ID 5:   Mikhail Geraskin

Analysis of the influence of stimulation on wide social groups' behavior based on the Stackelberg game

ID 12:   Irina Khaimovich, Vladimir Ramzaev and Vadim Chumak

Data modelling for analysis of readiness of municipal education in industry 5.0

ID 37:   Elena Rostova and Mikhail Geraskin

Model and algorithm for industrial risk- management at the regional level

ID 83:   Dmitriy Borisov, Aleksandr Blagov and Aleksey Inyushkin

Development of tools for processing and analysis of observational data on the activity of laboratory rats

ID 85:   Boris Likhttcinder

Adaptive data compression algorithm in wireless sensor networksI

ID 86:   Alena Sludnova, Vadim Shutko, Andrey Gaidel and Artem Nikonorov

Natural language processing methods for radiological reports classification

ID 90:   Marina Murtazina and Tatiana Avdeenko

The ontology-driven approach to intelligent support of requirements engineering in agile software development

ID 175:   Alexander Nechitaylo, Anna Gnutova and Olga Vasilchuk

Digital transformation of educational process planning at a university

ID 289:   Nikita Svyatov and Alexander Blagov

Forecasting the currency market using the autoregressive-moving average model

ID 369:   Boris Likhttcinder

Delays in QS queues with correlated application flows

ID 395:   leg Pavlov

Numerical solution of the dynamic incentive problem in discrete time with account the learning curve effect

ID 399:   Olga Kuznetsova and Michael Geraskin

Analysis of monopolistic competition in markets related to the sale of goods on credit.

ID 439:   Vladislav Dudnikov and Boris Melnikov

An approach to transforming DNA distance matrices in order to improve the original distance calculation algorithms

ID 495:   Igor Lvovich, Andrey Preobrazhenskiy and Oleg Choporov

Research of algorithms for processing information in wireless networks and filling the missing data

ID 551:   Rostislav Mikherskii and Dmitriy Kuznetsov

Analysis of open data of a social network in order to identify deviant communities

ID 617:   Elizaveta Repina and Elena Kochegurova

Time series prediction based on the penalty spline and the real-time DBScan cluster analysis algorithm

ID 621:   Anrew Bulynin, Boris Melnikov, Vladimir Meschanin and Julia Terentyeva

Algorithms for designing communication networks using greedy heuristics of various types

ID 636:   Elena Gusakova

Forming a unified information platform for managing a life cycle of a building object

ID 655:   Alexey Lipatov

The ternary logic for aerial objects groups detecting on base of undefined attributes

ID 679:   Vladimir Krotkov and Alexandra Danilenko

Library of tools, aimed at simplifying the development and performing automatic tests of console applications of any difficulty on C# and C++ programming languages

ID 782:   Olga Medvedeva, Sofya Mustafina and Alina Galeeva

Development of an Augmented Reality Mobile Application in Educational Purposes

ID 784:   Olga Medvedeva, Murat Soilu, Chingiz Burdzhumov and Ilgam Galiullin

Using Augmented Reality Technologies for Mobile Application Development

ID 260:   Oleg V. Goryachkin

Review of V.A. Soifer's work in the field of statistical communication theory

ID 477:   Irina V. Zhilavskaya

Media literacy as a factor of effective promotion of scientific journals in the international information environment (review on the example of a number of Russian scientific journals)

ID 804:   V.O. Sokolov

The 75th anniversary of Professor Vladimir Fursov

Track 2: "Methods and Algorithms"

ID 35: **Sergey Vostokin and Irina Bobyleva**

Implementation of frequency analysis of Twitter microblogging in a hybrid cloud based on the Binder, Everest platform and the Samara University virtual desktop service

ID 66: **Alnajjar Khaled and Igor Anikin**

Secure gamma generation for stream cipher based on fuzzy logic

ID 100: **Anna Grevtseva and Vadim Davydov**

A method for increasing the speed of processing the results of measurements of the parameters of a quantum frequency standard to increase the speed of information transfer in satellite communication systems

ID 109: **Oleg Golovnin and Ekaterina Sidorova**

Operational forecasting of road traffic accidents via neural network analysis of Big Data

ID 140: **Victor Tsvetov**

Wireless channel noises and data protection

ID 262: **Anastasiya Alekseeva, Irina Karpunina and Vladimir Klyachkin**

Analysis of the stability of the hydraulic unit according to the results of vibration monitoring

ID 272: **Yuliya Kuvayskova, Victor Krasheninnikov, Vladimir Klyachkin and Anastasia Alekseeva**

Fuzzy models for predicting the technical state of objects

ID 321: **Dmitry Rodin, Marina Rodina, Alexey Telegin and Igor Piyakov**

Simulation of a dust impact time-of-flight dust particle sensor

ID 346: **Aleksandr Kolpakov, Yuriy Kropotov and Alexey Belov**

Investigation of the RAM access model in a heterogeneous computing system

ID 461: **Valery Zasov**

Algorithm for verification the stability of signal separation for objects with changing characteristics

ID 491: **Diera Pirova, Borislav Zaberzhinskiy and Andrey Mashkov**

Detecting Heart Disease Symptoms Using Machine Learning Methods

ID 547: **Sergey Smirnov and Alexander Samoilov**

Properties Existence Constraints in Fuzzy Formal Concept Analysis

ID 559: **Egor Karlin, Vladimir Fursov and Valentin But**

Information technology for measuring velocity and visualizing the structure of fluid and gas flows.

ID 592: **Anton Valov, Nikita Lukashev and Vadim Davydov**

On the need to use the median signal filtering method to improve the metrological characteristics of the rubidium frequency standard when processing and transmitting large data arrays

ID 605: **Maxim Bobyr and Valentin Bulatnikov**

Modeling of a fuzzy filter and Kalman filter for processing the input signal

ID 613: **Sergey Demin, Oleg Panischev, Natalya Demina and Ruslan Latypov**

Application of statistical memory functions formalism in search of pathological brain activity diagnostic criteria

ID 616 **Sergey Demin, Oleg Panischev, Ruslan Latypov and Sergey Timashev**

Flicker-noise spectroscopy analysis of magnetoencephalogram signals in diagnosis of photosensitive epilepsy

ID 647: **Vitali Kuzmin and Dmitrii Elenev**

Monitoring and forecasting the operations of the transport complex of the enterprise

ID 658: **Valeriy Tutatchikov**

Implementation of a parallel version of the algorithm for calculating a two-dimensional FFT using an analog of the Cooley-Tukey algorithm

ID 720: **Vladimir Kostin and Aleksandr Borovsky**

Definition of basic violators for critically important objects using the information probability method and cluster analysis

ID 792: **Il'Ya Katanov**

Application of a perceptron to solve the problem of analyzing the fluorescence spectrum of a DBMBF2 sensor in a mixture of aromatic hydrocarbons

Track 3: "Artificial Neural Networks and Applications"

ID 19: **Vadim Pechenin, Michael Bolotov, Nikolay Ruzanov and Ekaterina Pechenina**

Creation neural network models for solving the problems of predicting the products geometric accuracy

ID 53: **Maximilian Khotilin, Alexander Kupriyanov, Natalia Kravtsova and Igor Rytsarev**

Classification of objects of natural hyperspectral images

ID 97:   **Nikita Davydov, Alexander Khramov and Artem Nikonorov**

Functional MRI recurrent real-time quality assessment estimation using OpenNFT

ID 126:   **Vadim Moshkin, Ilya Andreev, Vladimir Belov, Dmitry Drozdov and Roman Shakurov**

An integrated approach to mapping user profiles on social networks

ID 128   **Vadim Moshkin, Albina Koval and Anton Zarubin**

Ontology-based classification model of text resources of an electronic archive

ID 135:   **Alexander Yumaganov**

Searching for similar code sequences in executable files using siamese neural network

ID 153:   **Kseniya Medvedeva and Vladimir Fursov**

Application for operational linear-nonlinear correction of mobile images

ID 186:   **Viktoriia Evdokimova, Maksim Petrov, Marina Klyueva, Andrey Alekseev, Sergei Bibikov, Roman Skidanov and Artem Nikonorov**

Study of GAN-based image reconstruction for diffractive optical systems

ID 387:   **Albert Gareev, Evgeniy Minaev, Dmitriy Stadnik, Vladimir Protsenko, Ilia Popelniuk, Ashat Gimadiev and Artem Nikonorov**

Investigation of the effectiveness of neural network algorithms for the faults detection in hydraulic systems

ID 391:   **Alexey Borisov and Evgeny Myasnikov**

Dimensionality reduction using the GPU-accelerated gradient descent

ID 434:   **Vladimir Mokshin and Dinar Yakupov**

Graphs decomposition using modified spectral clustering method

ID 464:   **Pavel Ostapenko, Kamila Sultantemirova and Oleg Saprykin**

Adaptive traffic light control based on machine learning

ID 490:   **Anastasia Plisko, Pavel Serafimovich, Artem Nikonorov and Yuri Koush**

Detection of step-like head displacements in fMRI head motion data based on machine learning

ID 503:   **Albert Gareev, Dmitry Stadnik, Artem Nikonorov and Asgat Gimadiev**

Datasets gathering for hydraulic systems technical diagnosis using machine learning methods

ID 511:   **Alexandr Astafiev, Anton Demidov and Denis Privezentsev**

Analysis of the Applicability of the Bundle Method for the Construction of Multi-Code Labelings

ID 614:   Vladimir Fursov, Pavel Kuznetsov, Anton Kotov and Boris Martemyanov

The method of generalized functions in the problem of conformed estimation of the dynamic characteristics of video sequences

ID 631:   Artem Kabanov, Yelizaveta Morkhova and Natalya Kabanova

PATHFINDER toolkit for analysis of ion migration pathways in solids

ID 649:   Ekaterina Popova and Vladimir Spitsyn

Text classification based on the use of convolutional neural networks

ID 671:   Oleg Surnin, Pavel Sitnikov, Anastasia Khorina, Anton Ivaschenko, Anastasia Stolbova and Nataly Yu Ilyasova

Data exchange platform for digital economy

ID 745:   Roman Lobov and Ilia Lobov

Application of the method of automatic decision-making for the construction of the control algorithm for multi-drive systems.

ID 797:   Artem Nikonorov, Dmitriy Stadnik, Albert Gareev, Pavel Greshniakov and Asgat Gimadiev

Experimental study of neural networks-based fault detection methods efficiency for electro-hydromechanical systems

Track 4: "Machine Learning and Data Analysis"

ID 6:   Vladimir Chernov

A new approach to the synthesis of parallel error-free computing systems

ID 34:   Igor Rytsarev

Text data analysis using conversion analysis

ID 98:   Dmitry Ulyanov and Dmitry Savelyev

The investigation of the using the cyclic generative-competitive neural networks for image stylization

ID 139:   Daria Arkhipova and Egor Goshin

Influence of image set formation parameters on the result of super-resolution reconstruction

ID 150:   Sergey Parkhomenko

The creation of SDN testbed for network security algorithms development

ID 151:   Marina Golovastikova and Andrey Gaidel

Texture images classification using deep learning techniques

ID 152:   Yegor Goshin, Maksim Marchukov and Anton Kotov

Information technology for image stitching

ID 228: **Nickolay Shlyankin and Andrey Gaidel**

Application of the Hidden Markov Model for determining PQRST complexes in electrocardiograms

ID 267: **Kirill Musin and Andrey Gaidel**

Machine learning algorithms in the prediction of conflicts in clinical classification of genetic variants

ID 273: **Alexandr Rud, Sergey Rud, Michael Isaev and Dmitry Savelyev**

The using convolutional neural networks for determine the age of a person from an image

ID 296: **Igor Kilbas and Rustam Paringer**

Gradient as a foundation for building a loss function

ID 317: **Stanislav Abulkhanov**

Structural changes in microroughness preceding surface fatigue failure

ID 322: **Elizaveta Rudinskaya and Rustam Paringer**

Study of a face detection accuracy based on race and gender using Haar cascades

ID 330: **Stanislav Abulkhanov, Ivan Bayrikov, Dmitriy Goryainov and Oleg Slesarev**

Titanium cellular implant to replace bone defects in the jaw

ID 345: **Yegor Goshin, Pavel Volkhin and Anton Kotov**

Research of formats of test data sets for solving the odometry problem

ID 350: **Ilya Smirnov, Igor Rytsarev, Alexander Kupriyanov and Dmitriy Kirsh**

Development of algorithms for annotating information in social networks

ID 381: **Evgeniy Minaev**

High performance implementation of machine learning method based on fractal compression

ID 431: **Rail Gabbasov and Rustam Paringer**

Influence of the receptive field size on accuracy and performance of a convolutional neural network

ID 456: **Sergey Kostin and Andrey Gaidel**

Predicting exchange rate dynamics in the forex market using machine learning

ID 486: **Sergei Stepanenko and Pavel Yakimov**

Development of a cloud platform for gathering, storing and analysis of video data

ID 488: **Pavel Katkov and Alexander Khramov**

Detection of blackout in the lungs by X-ray DICOM image using neural networks

ID 492:   Artem Gaidar, Pavel Yakimov and Andrey Viktorenkov

Identification of defects in the inside of a metal pipe

ID 501:   Ekaterina Avdonina and Pavel Yakimov

Research of algorithm of detection of a pose of the person on the image and in a video stream

ID 654:   Dmitriy Kirsh

Parametric Identification of Crystal Lattices Based on Isosurface Configuration Analysis

ID 715:   Kirill Pugachev and Vladimir Fursov

Use of conformity principle in the visual odometry problem

ID 719:   Yuriy Kurbatov, Igor Rytsarev and Alexander Kupriyanov

Research of text data processing algorithms in social networks

ID 755:   Andrew Galochkin and Pavel Yakimov

Development of auto-review algorithm for conference management system

ID 756:   Nikolai Skladnev and Pavel Yakimov

Development of a service for tracking the trajectory of the object when moving in room using multiple cameras

ID 762:   Polina Katkova and Pavel Yakimov

3D Reconstruction via single 2D Image