

# Program of the X<sup>th</sup> Majorov International Conference on Software Engineering and Computer Systems

December 20-21, 2018, Saint Petersburg, Russia

ITMO University, Kronverkskiy pr., 49, lit. A, rooms: 285, 365, 371, 372, 375, 466

## Thursday, 20.12.18

Time	Location	Program
09:30 – 10:00	285	Conference Registration
10:00 – 10:30		Opening of the X <sup>th</sup> Majorov International Conference
10:30 – 11:20		Keynote talk: «Self-Driving Cars: Difficulties vs Opportunities? », by Boris Ivanov, <i>StarLine</i>
		Sessions (a)
11:40 – 13:40	375	Software Engineering (1a)
11:40 – 13:00	371	Computer Systems and Networks (2a)
	372	Computer Security (3)
<b>13:00 - 14:10</b>	365	Coffee talks, <b>Poster &amp; Demo session</b>
		Sessions (b)
14:10 – 16:25	375	Software Engineering (1b)
13:30 – 14:40	371	Computer Systems and Networks (2b)

## Friday, 21.12.18

Time	Location	Program
10:00 – 10:40	285	<b>Keynote talk: TRA Robotics</b> projects presentation.
10:45 – 11:30		<b>Keynote talk:</b> «Self Sovereign Identity: on DIDs and more», by Dirk Thatmann, <i>T-Systems</i>
		<b>Sessions (a)</b>
11:40 – 13:25	371	Cyber-Physical Systems (4a)
11:40 – 14:05	372	Multimedia Technologies and Computer Vision (5a)
<b>13:25 - 14:35</b>		<b>Break</b>
		<b>Sessions (b)</b>
14:00 – 15:35	371	Cyber-Physical Systems (4b)
14:35 – 17:00	372	Multimedia Technologies and Computer Vision (5b)
17:10 – 17:30	466	<b>Official closing of the X<sup>th</sup> Majorov International Conference</b>
17:30	365	<a href="#">BLACK DAY HACK in ITMO University</a>

# Software Engineering

*Chairman – Igor Bessmertnyi, vice-chairman – Ivan Perl*

Session 1a, 20.12.18, 11:40 – 13:40, room 375

No.	Time	Duration	Authors	Title
Full presentations				
1	11:40	15m	Konstantin Mazunin ( <i>ITMO University</i> )	Planning in Software Aggregation Systems
2	11:55	15m	Oleg Doronin, Dergun Karina and Andrey Dergachov ( <i>ITMO University</i> )	Automatic fuzzy-scheduling of threads in Google Thread Sanitizer to detect errors in multithreaded code
3	12:10	15m	Kirill Uryvaev ( <i>ITMO University</i> )	Developing a neural network learning library for solving time series forecasting problems
4	12:25	15m	Ildar Baimuratov and Dmitry Mouromtsev ( <i>ITMO University</i> )	Logic Graphs: A complete visualization method for logical languages based on Ch. S. Peirce's existential graphs
Short presentations				
5	12:40	10m	Valeriya Shulmina ( <i>ITMO University</i> )	PLR: automated attestation of laboratory works on the course "operating systems"
6	12:50	10m	Gulim Auken and Alexander Belozubov ( <i>ITMO University</i> )	Programmable decentralized information systems
7	13:00	10m	Anna Shurtina, Andrey Lyamin and Elena Cherepovskaya ( <i>ITMO University</i> )	Using learning analytics in research of learners' interactions with content
8	13:10	10m	Vladislav Fishchenko, Anastasia Kulikova, Ekaterina Derbeneva, Elnara Mamedova and Ilya Isaev ( <i>ITMO University</i> )	Use of Technology for Development Adaptive Chatbot Assistant
9	13:20	10m	Nataliia Matrosova and Dmitriy Shtennikov ( <i>ITMO University</i> )	Study Of Correlation Between Theory Learning Time And Testing Results
10	13:30	10m	Svyatoslav Oreshin and Lubov Lisitsyna ( <i>ITMO University</i> )	Approach to predicting the behaviour of complex systems based on machine learning methods
Total:		2h		

# Software Engineering

*Chairman – Igor Bessmertnyi, vice-chairman – Ivan Perl*

Session 1b, 20.12.18, 14:10 – 16:25, room 375

No.	Time	Duration	Authors	Title
<b>Full presentations</b>				
1	14:10	15m	Sergey Rakov, Vladislav Bortnikov, Andrey Dergachov and Alexandr Tropchenko ( <i>ITMO University</i> )	GAN-based loss functions for semantic segmentation
2	14:25	15m	Dmitriy Anoshchenkov and Aleksandr Penskoï ( <i>ITMO University</i> )	Using Lua as a tool for describing the computational process based on data transfers between processor units.
3	14:40	15m	Alexander Yarkeev, Alexander Pashnin, Ivan Uskov, Alexey Pismak and Evgenij Tsopa ( <i>ITMO University</i> )	Instance collision resolving algorithm in natural language processing
4	14:55	15m	Iaroslav Baranov ( <i>ITMO University</i> )	Improving listening skills in language learning with spaced repetition technique
5	15:10	15m	Bulat Kubekov, Leonid Bobrov, Elena Savelyeva, Vitaliy Naumenko and Anar Utegenova (Kazakhstan, Institute of Information and Computational Tehnologies, Kazakh - German University, Novosibirsk state university of Economics and Management)	Project-competent paradigm of knowledge representation of the three-level engineering education system
6	15:25	15m	Anna Bakanova and Aleksey Shikov ( <i>ITMO University</i> )	Ontology-based competency model for personalized corporate learning
7	15:40	15m	Dmitry A. Shuklin and Stanislav A. Sivinskiy ( <i>ITMO University</i> )	The question of intellectualization of analysis of educational data
<b>Short presentations</b>				
8	15:55	10m	Lyusiena Miroslavskaya and Igor Bessmertny ( <i>ITMO University</i> )	Extracting concepts from natural language texts based on context
9	16:05	10m	Tatiana Tatarnikova, Ekaterina Poymanova ( <i>Saint-Petersburg Electrotechnical University ETU "LETI", Saint-Petersburg State University of Aerospace Instrumentation</i> )	Storage Space Resource Management Models
10	16:15	10m	Aigul Nugmanova, Irina Chernykh, Mikhail Khovrichiev and Anna Bulusheva ( <i>ITMO University</i> )	Unsupervised Training of Automatic Dialog Systems for the Customer Support Service
<b>Total:</b>		<b>2h15m</b>		

# Computer Systems and Networks

Chairman – Taufik Aliev, vice-chairman – Pavel Balakshin

## Session 2a, 20.12.18, 11:40 – 13:00, room 371

No.	Time	Duration	Authors	Title
Full presentations				
1	11:40	15m	Ivan Slastikhin, Vladimir Bogatyrev and Ilya Noskov ( <i>ITMO University</i> )	The simulation model of the system with aggregated channels and redundant transmissions on the multiple access level
2	11:55	15m	Alexey Mulyukin and Ivan Perl ( <i>ITMO University</i> )	Model execution cloud platform architecture
3	12:10	15m	Sergei Zhmylev, Ilya Martynchuk and Valeriy Kireev ( <i>ITMO University</i> )	Analytical methods of nonstationary processes modeling
4	12:25	15m	Anatoly Bogatyrev, Sergei Liubich, Stanislav Bogatyrev, Fabian Wahle and Alexey Vanin ( <i>NEO Saint Petersburg Competence Center</i> )	The Model of Network Map and Data Placement in the Distributed Decentralized Storage Platform
Short presentations				
5	12:40	10m	Aleksey Derkach, Sergey Aleksankov and Vladimir Bogatyrev ( <i>ITMO University</i> )	Model of cluster reliability with support of continuity of computational process in the migration of virtual machines
6	12:50	10m	Elizaveta Kormilitsyna and Sergei Bykovskii ( <i>ITMO University</i> )	Development of tools for balancing the computation load in multiprocessor system
Total:		1h20m		

## Session 2b, 20.12.18, 13:30 – 14:40, room 371

No.	Time	Duration	Authors	Title
Full presentations				
1	13:30	15m	Stanislav Bogatyrev, Anatoly Bogatyrev, Sergei Liubich and Fabian Wahle ( <i>NEO Saint Petersburg Competence Center</i> )	Zero-Knowledge Data Validation Method based on the Homomorphic Hash Function in the Distributed Decentralized Storage Platform
2	13:45	15m	Alexey Vanin and Vladimir Bogatyrev ( <i>ITMO University</i> )	Push-gossip protocol efficiency with network topology propagation
Short presentations				
3	14:00	10m	Liudmila Muraveva-Vitkovskaia and Martin Raila ( <i>ITMO University</i> )	Evaluation of functionality's efficiency of computer systems with heterogeneous dataflow
4	14:10	10m	Elena Boldyreva ( <i>ITMO University</i> )	Development of the dynamic model of the information-management system
5	14:20	10m	Tatiana Tatarnikova and Oleg Kutuzov ( <i>Saint-Petersburg Electrotechnical University ETU "LETI", Saint-Petersburg State University of Aerospace Instrumentation</i> )	The procedure for evaluation the self-similar network traffic properties
6	14:30	10m	Ilya Noskov, Vladimir Bogatyrev and Ivan Slastikhin ( <i>ITMO University</i> )	Simulation of computer network with switch and packet reservation
Total:		1h10m		

# Computer Security

Chairman – to be determined, vice-chairman – to be determined

Session 3, 20.12.18, 11:40 – 13:00, room 372

No.	Time	Duration	Authors	Title
Short presentations				
1	11:40	10m	Azamat Kulmakhanov ( <i>ITMO University</i> )	Analysis of methods for protecting information transmitted via fiber-optic communication lines
2	11:50	10m	Maksim Pakulin ( <i>ITMO University</i> )	The concept of network security in automated process control systems
3	12:00	10m	Timur Platonov and Alexander Ogolyuk ( <i>ITMO University</i> )	Web Application Firewalls in the modern world
4	12:10	10m	Timur Platonov ( <i>ITMO University</i> )	Overview of encoders typical patterns and methods of their detection
5	12:20	10m	Vladimir Kolomoitcev and Vladimir Bogatyrev ( <i>ITMO University</i> )	Computational complexity of the method for estimating the probability of threat detection by a system of secure access.
6	12:30	10m	Anton Kurako and Sergei Bykovskii ( <i>ITMO University</i> )	Protecting Data Privacy using Zero-Knowledge Cryptography
7	12:40	10m	Irina Brysina and Tatyana Markina ( <i>ITMO University</i> )	IOT security levels
8	12:50	10m	Zhengqing Wang and Tatiana Markina ( <i>ITMO University</i> )	Research on code obfuscation technology
Total:		1h20m		

# Cyber-Physical Systems

Chairman – Aleksei Platunov, vice-chairman – Alexandr Penskoi

Session 4a, 21.12.18, 11:40 – 13:25, room 371

No.	Time	Duration	Authors	Title
Full presentations				
1	11:40	15m	Danila Nikiforovskii, Ivan Deyneka and Daniil Smirnov ( <i>ITMO University</i> )	Features of hardware implementation of Particle Swarm Optimization (PSO) on FPGA
2	11:55	15m	Elisey Litvinov, Ivan Deyneka and Artem Aleinik ( <i>ITMO University</i> )	Optical transceivers characteristics estimation using FPGA
3	12:10	15m	Eleonora Dorofeeva, Danila Nikiforovskii and Ivan Deyneka ( <i>ITMO University</i> )	Features of the hardware implementation of real time Hough transform on FPGA
4	12:25	15m	Vladislav Shmatkov, Sergei Spynu and Vladimir Pimenov ( <i>ITMO University</i> )	Prototype platform for testing heterogeneous networks in IoT enviroment
5	12:40	15m	Sergey Chuprov, Ilya Viksnin, Maria Usova and Julia Kim ( <i>ITMO University</i> )	Intersection Management Tasks in Mobile Robotic System with Decentralized Control
Short presentations				
6	12:55	10m	Stepan Gavrilov, Aidana Kyzdarbekova and Stanislav Reznikov ( <i>ITMO University</i> )	Neurocomputer interfaces for detecting control signals of bionic devices based on the analysis of physiological and nervous processes in human
7	13:05	10m	Nikita Tursukov ( <i>ITMO University</i> )	Model of functioning of unmanned aerial vehicles in the robot simulation environment V-REP
8	13:15	10m	Maria Usova and Ilya Viksnin ( <i>ITMO University</i> )	Smart manufacture model
Total:		1h45m		

# Cyber-Physical Systems

Chairman – Aleksei Platunov, vice-chairman – Alexandr Penskoi

Session 4b, 21.21.18, 14:00 – 15:35, room 371

No.	Time	Duration	Authors	Title
Full presentation				
1	14:00	15m	Tatyana Astakhova, Natalia Verzun, Mikhail Kolbanev and Alexey Shamin (Nizhny Novgorod State University of Engineering and Economics, St. Petersburg Electrotechnical University "LETI", St. Petersburg State University of Economics)	A model for estimating energy consumption seen when nodes of ubiquitous sensor networks communicate information to each other
Short presentations				
2	14:15	10m	Danila Shipaev ( <i>ITMO University</i> )	Software tool of the stand SDK 1.1M
3	14:25	10m	Arkady Ivashchenko and Pavel Korepanov ( <i>ITMO University</i> )	Automatic generation of factory production schedule
4	14:35	10m	Alexander Gaiosh ( <i>ITMO University</i> )	Synthesis methods for reconfigurable real-time computational platform
5	14:45	10m	Dranitsa Alexander and Platunov Aleksei ( <i>ITMO University</i> )	RISC-V based platform for cyber-physical systems design
6	14:55	10m	Irina Deeva ( <i>ITMO University</i> )	Multiscale Personality Modeling in the Digital Environment
7	15:05	10m	Dmitriy Zyryanov, Natalya Denissova and Igor Bessmertnyi ( <i>D. Serikbayev East Kazakhstan state technical university, ITMO University</i> )	Analysis and synthesis of typical behavioral structures for cyber physical systems agents
8	15:15	10m	Darya Polyakova and Philipp Perepelitca ( <i>ITMO University</i> )	Features of the use of software algorithms and technologies of generative design to optimize products in autodesk netfabb
9	15:25	10m	Yaroslav Gorbachev ( <i>ITMO University</i> )	Conceptual model and definition method of computational process implementation
Total:		1h35m		

# Multimedia Technologies and Computer Vision

Chairman – Artem Smolin, vice-chairman – Dmitry Zhdanov

Session 5a, 21.12.18, 11:40 – 14:05, room 372

No.	Time	Duration	Authors	Title
Full presentations				
1	11:40	15m	Nickolay Goryachev and Gleb Rogozinsky ( <i>The Bonch-Bruевич State University of Telecommunication</i> )	Yamaha TX-81Z FM Synthesizer Modeling in Csound
2	11:55	15m	Maxim Sorokin ( <i>ITMO University</i> )	Recovery of optical parameters of a scene using fully-convolutional neural networks
3	12:10	15m	Aleksandr Mezhenin, Vera Izvozhikova and Viktorija Ivanova ( <i>ITMO University, Orenburg State University</i> )	Use of point clouds for video surveillance system cover zone imitation
4	12:25	15m	Dmitrij Afonkin ( <i>ITMO University</i> )	The problem of physically based rendering in the cloud computing system
5	12:40	15m	Assel Romanova, Irina Gotskaya and Dmitriy Shuklin ( <i>Russian State Pedagogical University, ITMO University</i> )	Perspectives of using educational mobile virtual technologies in higher education
6	12:55	15m	Aleksandr Mezhenin and Alena Zhigalova ( <i>ITMO University</i> )	Similarity analysis using Hausdorff metrics
7	13:10	15m	Artem Andreev ( <i>ITMO University</i> )	Application of texture maps with MIP levels generated using dual filtering, in tasks of realistic lighting and reflection rendering in a presence of area lights.
Short presentations				
8	13:25	10m	Aleksandr Mezhenin and Yuliya Trushin a ( <i>ITMO University</i> )	Improving Baked Textures for a Content Creator
9	13:35	10m	Darya Belova ( <i>ITMO University</i> )	Using VR technologies as a part of psychocorrection procedures
10	13:45	10m	Andrey Zhdanov ( <i>ITMO University</i> )	Analysis of the visual perception conflicts in mixed reality systems
11	13:55	10m	Aleksandra Govorova ( <i>ITMO University</i> )	Virtual Reality as a new way to train people to be safe in emergencies
12	14:05	10m	Irina Stokolias ( <i>ITMO University</i> )	360 degree image processing automation
Total:		2h35m		



# Multimedia Technologies and Computer Vision

Chairman – Artem Smolin, vice-chairman – Dmitry Zhdanov

Session 5b, 21.12.18, 14:35 – 17:00, room 372

No.	Time	Duration	Authors	Title
Full presentations				
1	14:35	15m	Valery Sizikov, Daria Kondulukova and Andrei Sergienko ( <i>ITMO University</i> )	Improving the accuracy of restoring a distorted image via determining the distortion parameters from the Fourier spectrum,
2	14:50	15m	Valery Sizikov and Aleksandra Dovgan ( <i>ITMO University</i> )	Reconstruction of images smeared non-uniformly
3	15:05	15m	Aleksei Lavrov and Nikita Marinichev ( <i>ITMO University</i> )	Estimation of the Quantity of Errors in the Optitrack Motion Capture System
4	15:20	15m	Vladimir Gromov and Pavel Kustarev ( <i>ITMO University</i> )	3D models matching and fusion with the use of 2D disparity maps
5	15:35	15m	Tatiana Osipenko ( <i>ITMO University</i> )	Устранение шума с сохранением мелких деталей в фотореалистичных изображениях, вычисленных методами стохастической трассировки лучей
Short presentations				
6	15:50	10m	Aleksei Lavrov and Valeriy Sizikov ( <i>ITMO University</i> )	Evaluation of the Restoration Error of the Partly Overlapped Spectral Lines
7	16:00	10m	Dmitrii Burtykin ( <i>ITMO University</i> )	Problems with development of an effective ray tracing library using Vulkan API
8	16:10	10m	Aleksandr Smirnov, Evgeniy Trunin, Sizov Pavel, Ilya Isaev, Ivan Chizhikov, Pavel Filonov, Artur Ovsepyan, Vladislav Chernykh, Shakir Kudla Chmedov, Larisa Murt and Azat Nazmiev ( <i>North-Western state medical University I.I. Mechnikov, Saint-Petersburg Electrotechnical University "LETI", ITMO University</i> )	The new prospects in the diagnosis the papillary thyriod carcinoma using the technical vision systems
9	16:20	10m	Artem Smolin and Konstantin Malyshev	Multimodal Perception in Virtual Reality Environments
10	16:30	10m	Andrew Lemeshev ( <i>ITMO University</i> )	Methods for efficiently filtering the synthesized image to solve problems of realistic real-time rendering
11	16:40	10m	Aleksei Denisov and Sergei Bykovskii ( <i>ITMO University</i> )	Using Neural Networks for Stereo Matching
12	16:50	10m	Miguelangel Perezortiz ( <i>ITMO University</i> )	Visualization and Segmentation of Tropical Cyclones in Satellite images using the Dvorak technique.
Total:		2h25m		

Poster & Demo session, 20.12.18, 13:00 – 14:10, room 365

No.	Authors	Title
1	Anna Lavrova, Larisa Sopronenko, Aleksei Lavrov	Development of interactive application for viewing different color schemes for interior of Feodorovsky Gorodok Refectory
2	Babushkin A., Danenkov I., Babikov A.	AR PCB assistant
3	Tishchuk B., Emelyanov D.	Onboard computer for mobile robotic systems.
4	Antonov A., Andreev V., Didin E., Babushkin A., Denisov A., Dranitsa A., Emelyanov D., Gromov V., Kurylev D., Tishchuk B.	Mobile 3D Scanner
5	Zhovnitsky V., Kluchev V., Yastrebov E., Kluchev A.	Mobile platform for researching unmanned driving algorithms
6	Korenkov Y., Loginov I., Kuzenkova E.	Language Workbench