



Information Technologies
and Mathematical Modelling
named after A.F. Terpugov

2021
December 1-5
Tomsk, Russia
online/offline

20th International Conference
named after A. F. Terpugov

**INFORMATION TECHNOLOGIES
AND MATHEMATICAL MODELLING**

ITMM – 2021

Tomsk, Russia
December, 1-5, 2021

CONFERENCE INTERNATIONAL PROGRAM COMMITTEE
МЕЖДУНАРОДНЫЙ ПРОГРАММНЫЙ КОМИТЕТ КОНФЕРЕНЦИИ

Alexander Dudin, Belarusian State University, Belarus – chair

Anatoly Nazarov, National Research Tomsk State University, Russia – co-chair

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Pedro Cabral, Universidade Nova de Lisboa, Portugal

Pau Fonseca i Casas, Universitat Politècnica de Catalunya, Spain

Srinivas Chakravarthy, Kettering University, USA

Bong Dae Choi, Korea University, Korea

Tadeusz Czachórski, Institute of Theoretical and Applied Informatics, Polish Academy of Sciences, Poland

Rui Dinis, Universidade Nova de Lisboa, Portugal

Dmitry Efrosinin, Johannes Kepler University, Austria

Mais Farhadov, Institute of Control Sciences, Russian Academy of Sciences, Russia

Yulia Gaydamaka, Peoples' Friendship University of Russia, Russia

Erol Gelenbe, Imperial College, London, United Kingdom

Alexander Gortsev, National Research Tomsk State University, Russia

Che Soong Kim, Sangji University, Korea

Bara Kim, Korea University, Korea

Udo Krieger, Otto Friedrich University of Bamberg, Germany

Achyutha Krishnamoorthy, CMS College, India

Krishna Kumar, Anna University, India

Quan-Lin Li, Yan Shan University, China

Yury Malinkovsky, Francisk Skorina Gomel State University, Belarus

Agassi Melikov, National Aviation Academy of Azerbaijan, Azerbaijan

Alexander Moiseev, National Research Tomsk State University, Russia

Tareg Hamadneh, Al Zaytoonah University of Jordan, Jordan

Azam Imomov, Karshi State University, Uzbekistan

Svetlana Moiseeva, National Research Tomsk State University, Russia
Dmitri Moltchanov, Tampere University of Technology, Finland
Paulo Montezuma-Carvalho, Universidade Nova de Lisboa, Portugal
Evsey Morozov, Petrozavodsk State University, Russia
Valeriy Naumov, Service Innovation Research Institute, Finland
Rein Nobel, Vrije Universiteit Amsterdam, The Netherlands
Michele Pagano, Pisa University, Italy
Tuan Phung-Duc, University of Tsukuba, Japan
Jacques Resing, Eindhoven University of Technology, The Netherlands
Vladimir Rykov, Gubkin Russian State University of Oil and Gas, Russia
Konstantin Samuylov, Peoples' Friendship University of Russia, Russia
Sergey Suschenko, National Research Tomsk State University, Russia
Janos Sztrik, University of Debrecen, Hungary
Henk Tijms, Vrije Universiteit Amsterdam, The Netherlands
Oleg Tikhonenko, Cardinal Stefan Wyszyński University in Warsaw, Poland
Gurami Tsitsiashvili, Institute of Applied Mathematics, Far Eastern Branch of Russian Academy of Sciences, Russia
Vladimir Vishnevsky, Institute of Control Sciences, Russian Academy of Sciences, Russia
Anton Voitishkek, Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Russia
Vladimir Zadorozhny, Omsk State Technical University, Russia
Alexander Zamyatin, National Research Tomsk State University, Russia
Andrey Zorin, Lobachevsky State University of Nizhni Novgorod, Russia
Amdjed Zraigad, Al Zaytoonah University of Jordan, Jordan
Mohammad Ahmad Alia, Al Zaytoonah University of Jordan, Jordan
Stanislav Shidlovskiy, National Research Tomsk State University, Russia

CONFERENCE ORGANIZING COMMITTEE
ОРГАНИЗАЦИОННЫЙ КОМИТЕТ КОНФЕРЕНЦИИ

Svetlana Moiseeva, National Research Tomsk State University, Russia – chair
Azam Imomov, Karshi State University, Uzbekistan – co-chair
Svetlana Paul, National Research Tomsk State University, Russia – co-chair
Ekaterina Lisovskaya, National Research Tomsk State University, Russia – co-chair

Valentina Broner, National Research Tomsk State University, Russia
Elena Danilyuk, National Research Tomsk State University, Russia
Ekaterina Fedorova, National Research Tomsk State University, Russia
Irina Kochetkova, Peoples' Friendship University of Russia, Russia
Ivan Lapatin, National Research Tomsk State University, Russia
Andrey Larionov, Institute of Control Sciences, Russian Academy of Sciences, Russia
Olga Lizyura, National Research Tomsk State University, Russia
Anna Morozova, National Research Tomsk State University, Russia
Ekaterina Pankratova, Institute of Control Sciences, Russian Academy of Sciences, Russia
Svetlana Rozhkova, National Research Tomsk Polytechnic University, Russia
Daria Semenova, Siberian Federal University, Russia
Maria Shklennik, National Research Tomsk State University, Russia
Alexey Shkurkin, National Research Tomsk State University, Russia
Konstantin Voytikov, Moscow Institute of Physics and Technology, Russia

CONFERENCE ORGANIZERS ОРГАНИЗАТОРЫ КОНФЕРЕНЦИИ



National Research
**Tomsk
State
University**

National Research Tomsk State University
Национальный исследовательский Томский государственный университет



**RUDN
university**

Peoples' Friendship University of Russia
Российский университет дружбы народов



V.A. Trapeznikov Institute of Control Sciences of Russian Academy of Sciences
Институт проблем управления им. В.А. Трапезникова РАН



**KARSHI
STATE
UNIVERSITY**

Karshi State University
Каршинский государственный университет, Узбекистан

CONFERENCE PROGRAMM
ПЛАН РАБОТЫ КОНФЕРЕНЦИИ

Venue: National Research Tomsk State University, 634050, Lenina av. 36, Tomsk, Russian Federation

Место проведения: Национальный исследовательский Томский государственный университет, Томск, Россия

Platform: Zoom

December 1, 2021 / 1 декабря 2021 г.

10.00–12.30 (Moscow) / 14.00–16.30 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAaWUWlZSzdZdVVMMSG9QTHYxdz09>

10.00–10.45 (Moscow)	Opening ceremony of the 20th International Conference «Information Technologies and Mathematical Modelling» (ITMM – 2021) named after A.F. Terpugov. Welcome address by: Nazarov Anatoly , Institute of Applied Mathematics and Computer Science, Tomsk State University, Russia Konstantin Samuylov , Director of Institute of Applied Mathematics & Communications Technology, Peoples' Friendship University of Russia, Russia
14.00–14.45 (Tomsk)	Mais Farhadov , Head of Laboratory ASMON, Institute of Control Sciences, Russian Academy of Sciences, Russia Azam Imomov , Head of Department, Karshi State University, Uzbekistan
10.45–11.45 (Moscow)	Plenary talk «Reliability Inventory» Achyutha Krishnamoorthy , CMS College, India
14.45–15.45 (Tomsk)	Moderator: Olga Lizyura, National Research Tomsk State University, Russia
11.45–12.30 (Moscow)	Plenary talk «Evolution of Erlang Loss Formula» Konstantin Samuylov , Director of Institute of Applied Mathematics & Communications Technology, Peoples' Friendship University of Russia, Russia
15.45–16.30 (Tomsk)	Moderator: Olga Lizyura, National Research Tomsk State University, Russia

December 1, 2021 / 1 декабря 2021 г.

12.30–14.40 (Moscow) / 16.30–18.40 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAaWUWlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 1»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 1»

Working language: English

Chief: **Achyutha Krishnamoorthy**, CMS College, India

Alexander Moiseev, National Research Tomsk State University, Russia

Moderator: **Olga Lizyura**, National Research Tomsk State University, Russia

12.30–13.00 (Moscow)	<i>Khamis Abdullah Khamis AL Maqbali, Varghese C. Joshua, Achyutha Krishnamoorthy</i>	On A Queueing Inventory System With Marked Compound Poisson Input And Exponentially distributed Batch Service
16.30–17.00 (Tomsk)		
13.00–13.20 (Moscow)	<i>Sandhya E, Sreenivasan C., Sajeev Nair</i>	An Explicit Solution for an Inventory Model with Positive Lead Time and Server Interruptions
17.00–17.20 (Tomsk)		
13.20–13.40 (Moscow)	<i>Anatoly Nazarov, Alexandr Moiseev, Olga Lizyura, Ivan Lapatin, Svetlana Paul, Pavel Pristupa, X. Peng, L. Chen, B. Bai</i>	Problem of Real Waiting Time in Resource Queue with Markovian Arrival Process
17.20–17.40 (Tomsk)		
13.40–14.00 (Moscow)	<i>Anilkumar M. P., Jose K. P.</i>	Discrete Time Queue with Self Interruption Resulting Reduced Priority
17.40–18.00 (Tomsk)		
14.00–14.20 (Moscow)	<i>Thresiamma N. J., Jose K. P.</i>	A production inventory model with n- policy
18.00–18.20 (Tomsk)		
14.20–14.40 (Moscow)	<i>Attila Kuki, János Sztrik, Tamás Berczes</i>	Modeling Two-Way Communication Systems with Catastrophic Breakdowns
18.20–18.40 (Tomsk)		

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15.00–17.00 (Moscow) / 19.00–21.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 2»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 2»

Working language: Russian, English

Chiefs: **Anatoly Nazarov**, National Research Tomsk State University, Russia

Evsey Morozov, Petrozavodsk State University, Russia

Moderator: **Svetlana Paul**, National Research Tomsk State University, Russia

15.00–15.20 (Moscow)	<i>Stepan Rogozin, Evsey Morozov</i>	Stability analysis of classical retrials: a revised regenerative proof
19.00–19.20 (Tomsk)		
15.20–15.40 (Moscow)	<i>Ekaterina Bulinskaya</i>	Limit behavior and stability of applied probability systems
19.20–19.40 (Tomsk)		
15.40–16.00 (Moscow)	<i>Fazikhuddin Abdushukurov</i>	On asymptotics of a probability of the event: each cell contains even number of particles
19.40–20.00 (Tomsk)		
16.00–16.20 (Moscow)	<i>Irina Peshkova, Evsey Morozov</i>	On extremal indexes of waiting times in queueing systems with Weibull service times
20.00–20.20 (Tomsk)		
16.20–16.40 (Moscow)	<i>Головин Александр, Румянцев Александр</i>	Исследование производительности односерверной системы обслуживания с режимами разогрева и выключения
20.20–20.40 (Tomsk)		
16.40–17.00 (Moscow)	<i>Elena Stankevich, Igor Tananko, Michele Pagano</i>	Метод анализа открытой сети массового обслуживания с групповым обслуживанием
20.40–21.00 (Tomsk)		

December 2, 2021 / 2 декабря 2021 г.

07.00–08.00 (Moscow) / 11.00–12.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlWFZSzdZdVVMSG9QTHYxdz09>

07.00–07.40 (Moscow)	Plenary talk «Impact of Computing and Data Revolution on Research, Science and Society» Dr. Shahjahan Khan , Professor of Statistics School of Sciences University of Southern Queensland, Australia Moderators: Svetlana Paul, National Research Tomsk State University, Russia Valentina Broner, National Research Tomsk State University, Russia
11.00–11.40 (Tomsk)	
07.40–08.00 (Moscow)	Presentation «Journal of Applied Probability and Statistics» Dr. Shahjahan Khan , Professor of Statistics School of Sciences University of Southern Queensland, Australia Moderators: Svetlana Paul, National Research Tomsk State University, Russia Valentina Broner, National Research Tomsk State University, Russia
11.40–12.00 (Tomsk)	

December 2, 2021 / 2 декабря 2021 г.

09.00–10.40 (Moscow) / 13.00–14.40 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 3»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 3»

Working language: Russian, English

Chiefs: **Alexander Dudin**, Belarusian State University, Belarus

Anatoly Nazarov, National Research Tomsk State University, Russia

Moderator: **Maria Shklennik**, National Research Tomsk State University, Russia

09.00–09.20 (Moscow)	<i>Mamed Shahmaliyev,</i>	Queuing systems with positive and negative replenishment policies
13.00–13.20 (Tomsk)	<i>Agassi Melikov</i>	
09.20–09.40 (Moscow)	<i>Jakhongir Azimov</i>	Transition phenomenon in branching random process with state-dependent immigrations
13.20–13.40 (Tomsk)		
09.40–10.00 (Moscow)	<i>Valentina Klimenok,</i>	Система массового обслуживания с двумя типами запросов и ограниченным разделением процессора
13.50–14.10 (Tomsk)	<i>Alexander Dudin</i>	
10.00–10.20 (Moscow)	<i>Valentina Klimenok,</i>	Тандемная система массового обслуживания ВМАР/G/1 - > . /PH/N/R
14.00–14.20 (Tomsk)	<i>Alexander Dudin, Olga Dudina</i>	
10.20–10.40 (Moscow)	<i>Alexander Dudin,</i>	Система массового обслуживания с перемещающимися нетерпеливыми пользователями
14.20–14.40 (Tomsk)	<i>Sergei Dudin, Olga Dudina</i>	

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11.00–13.00 (Moscow) / 15.00–17.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdZdVVMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 4»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 4»

Working language: Russian, English

Chiefs: **Gurami Tsitsiashvili**, Far Eastern Branch of Russian Academy of Sciences, Russia

Svetlana Paul, National Research Tomsk State University, Russia

Moderator: **Ivan Lapatin**, National Research Tomsk State University, Russia

11.00–11.20 (Moscow)	<i>Andrey Vorkozhokov, Ivan Lapatin</i>	Исследование зависимости характеристик выходящего потока двухфазной модели от параметров первой фазы
15.00–15.20 (Tomsk)		
11.20–11.40 (Moscow)	<i>Alexey Blaginin, Ivan Lapatin</i>	Исследование области применимости асимптотического двумерного выходящего потока системы с вызываемыми заявками
15.20–15.40 (Tomsk)		
11.40–12.00 (Moscow)	<i>Oleg Reshetnikov, Ivan Lapatin</i>	Исследование зависимости характеристик марковской модели узла передачи данных от параметров перекрытия канала
15.40–16.00 (Tomsk)		
12.00–12.20 (Moscow)	<i>Gurami Tsitsiashvili</i>	Synergistic effects in queuing systems and related statistical problems
16.00–16.20 (Tomsk)		
12.20–12.40 (Moscow)	<i>Azam A.Imomov, Zukhriddin A.Nazarov, Misliddin S.Murtazaev</i>	On properties of a structural parameter of the markov Q-process
16.20–16.40 (Tomsk)		
12.40–13.00 (Moscow)	<i>Azam A.Imomov, Erkin E.Tukhtaev</i>	Local limit theorem for some class of Galton-Watson branching processes allowing immigration without finite variances
16.40–17.00 (Tomsk)		

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13.00–14.00 (Moscow) / 17.00–18.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlWFZSzdZdVVMSG9QTHYxdz09>

13.00–14.00
(Moscow)

Lecture for young scientists «Технология IAB для сетей 5G+ и другие текущие задачи 3GPP»
Dmitry Molchanov, Tampere University, Finland

17.00–18.00
(Tomsk)

Peoples' Friendship University of Russia, Russia
Moderator: Ekaterina Lisovskaya, National Research Tomsk State University, Russia

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14.00–16.00 (Moscow) / 18.00–20.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAaWUWlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 5»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 5»

Working language: English

Chief: **Janos Sztrik**, University of Debrecen, Hungary

Andrei Zorine, Lobachevsky State University of Nizhni Novgorod, Russia

Moderator: **Olga Lizyura**, National Research Tomsk State University, Russia

14.00–14.20 (Moscow)	<i>Mohamed Hedi Zaghouni,</i>	Performance investigation of reverse balking in cognitive radio networks using simulation
18.00–18.20 (Tomsk)	<i>Hamza Nemouchi, János Sztrik</i>	
14.20–14.40 (Moscow)	<i>János Sztrik, Tóth Ádám</i>	Analysis of finite-source retrial queueing systems with impatient customers and catastrophic breakdowns using simulation
18.20–18.40 (Tomsk)		
14.40–15.00 (Moscow)	<i>Andrei Zorine</i>	On the existence of the stationary distribution in a polling system with autoregressive Poisson inputs
18.40–19.00 (Tomsk)		
14.20–14.40 (Moscow)	<i>Taisia Morozova, Evsey Morozov</i>	Pasta for remaining service time in stable and unstable queues
18.20–18.40 (Tomsk)		
14.40–15.00 (Moscow)	<i>Anatoly Nazarov, Olga Lizyura</i>	Diffusion approximation for retrial queue with collisions and non-persistent customers
18.40–19.00 (Tomsk)		
15.00–15.20 (Moscow)	<i>Eduard Sopin, Vyacheslav Begishev,</i>	Approximate Analysis of a Network of Resource Loss Systems
19.00–19.20 (Tomsk)		
15.20–15.40 (Moscow)	<i>Ksenia Zhukova, Evsey Morozov</i>	A large deviation analysis of a retrial queue with general retrieval time
19.20–19.40 (Tomsk)		
15.40–16.00 (Moscow)	<i>Azam A.Imomov, Abror Kh.Meyliev</i>	Local limit theorems for some class of Markov branching processes allowing Immigration without higher-order Moments
19.40–20.00 (Tomsk)		

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07.40–09.20 (Moscow) / 11.40–13.20 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 6»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 6»

Working language: Russian

Chief: **Anatoly Nazarov**, National Research Tomsk State University, Russia

Moderator: **Evgeny Polin**, National Research Tomsk State University, Russia

07.40–08.00 (Moscow)	<i>Polkhovskaya Anna, Danilyuk Elena, Moiseeva Svetlana</i>	Исследование RQ-системы M/M/1 с ненастойчивыми заявками с коллизиями и отказами
11.40–12.00 (Tomsk)		
08.00–08.20 (Moscow)	<i>Anatoly Nazarov, Svetlana Rozhkova, Ekaterina Titarenko</i>	Асимптотический анализ RQ-системы M/M/1/N–1 с обратными связями
12.00–12.20 (Tomsk)		
08.20–08.40 (Moscow)	<i>Evgeny Polin, Svetlana Moiseeva</i>	Асимптотический анализ неоднородной СМО MR M ∞, функционирующей в полумарковской случайной среде, в условии эквивалентного роста времени обслуживания на приборах
12.20–12.40 (Tomsk)		
08.40–09.00 (Moscow)	<i>Nataliya Voronina, Svetlana Rozhkova, Svetlana Moiseeva</i>	Исследование RQ-системы MMPP/M/1 с ненадежным прибором асимптотическим методом
12.40–13.00 (Tomsk)		
09.00–09.20 (Moscow)	<i>Ekaterina Fedorova</i>	Асимптотический анализ RQ-системы MMPP/M/N в условии большой загрузки
13.00–13.20 (Tomsk)		

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10.00–12.20 (Moscow) / 14.00–16.20 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlWFlzSzdzdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 7»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 7»

Working language: Russian, English

Chiefs: **Andrei Zorine**, Lobachevsky State University of Nizhni Novgorod, Russia

Svetlana Paul, National Research Tomsk State University, Russia

Moderator: **Ekaterina Pavlova**, National Research Tomsk State University, Russia

10.00–10.20 (Moscow)	<i>Anatoly Nazarov, Radmir Salimzyanov,</i>	Resource queueing system with feedback as a model for servicing two types of traffic
14.00–14.20 (Tomsk)	<i>Ekaterina Lisovskaya</i>	
10.20–10.40 (Moscow)	<i>Kirill Sizov, Andrei Zorine</i>	Моделирование и анализ серверных ферм с разогревом
14.20–14.40 (Tomsk)		
10.40–11.00 (Moscow)	<i>Evgeniy Kudryavtsev, Mikhail Fedotkin</i>	Оптимизация системы адаптивного управления конфликтными потоками Кокса-Льюиса
14.40–15.00 (Tomsk)		
11.00–11.20 (Moscow)	<i>Natalia Stepanova, Mais Farkhadov</i>	Анализ распределения времени реализации ресурса с нулевым конечным запасом и экспоненциально распределенными запросами
15.00–15.20 (Tomsk)		
11.20–11.40 (Moscow)	<i>Stepan Lembrikov, Elena Kuvykina</i>	Влияние параметров потока Бартлетта на процесс управления конфликтными потоками на перекрёстке
15.20–15.40 (Tomsk)		
11.40–12.00 (Moscow)	<i>Dzmitry Kopats</i>	Асимптотический анализ G-сети с ненадёжными многолинейными системами обслуживания
15.40–16.00 (Tomsk)		
12.00–12.20 (Moscow)	<i>Sergey Vasilyev, Soltan Kanzitdinov,</i>	Численный анализ крупномасштабной нейронной сети Хопфилда с малыми параметрами
16.00–16.20 (Tomsk)		

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11.00–13.40 (Moscow) / 15.00–17.40 (Tomsk)

<https://us02web.zoom.us/j/4571137585?pwd=Z3l2SjZtMGFmTERta0VzcGo1c1dUZz09>

TRACK «Mathematical and Computer Modelling in Engineering, Natural Science, Economics, Education, Humanities and Other Fields 1» / СЕКЦИЯ «Математическое и компьютерное моделирование в технике, естествознании, экономике, образовании, гуманитарных науках и других областях 1»

Working language: Russian, English

Chiefs: **Mais Farhadov**, Institute of Control Sciences, Russian Academy of Sciences, Russia

Daria Semenova, Siberian Federal University, Russia

Moderator: **Pankratova Ekaterina**, Institute of Control Sciences, Russian Academy of Sciences, Russia

11.00–11.20 (Moscow)	<i>Aleksandr Bulavchuk, Daria Semenova</i>	Задача RCSP для инвестиционных проектов в условиях ограниченности ресурсов и неопределённости затрат и доходов
15.00–15.20 (Tomsk)		
11.20–11.40 (Moscow)	<i>Aleksandr Soldatenko, Daria Semenova</i>	О задачах в анализе дорожных сетей с точками интереса
15.20–15.40 (Tomsk)		
11.40–12.00 (Moscow)	<i>Edgar Solis Romeu, Dmitriy Shashev</i>	Neural Networks Architecture Applied to Neural Networks
15.40–16.00 (Tomsk)		
12.00–12.20 (Moscow)	<i>A.A. Азимов</i>	Вычисления корней многочлена от двух неизвестных с помощью степенной геометрии
16.00–16.20 (Tomsk)		
12.20–12.40 (Moscow)	<i>Timofey Tislenko, Daria Semenova</i>	Задача MARL для светофорной сети
16.20–16.40 (Tomsk)		
12.40–13.00 (Moscow)	<i>H.Y. Окбаева</i>	Использование математического моделирования в качестве основы для решения задач по математике
16.40–17.00 (Tomsk)		
13.00–13.20 (Moscow)	<i>Mumin Abulov</i>	Краевая задача для одного класса уравнений третьего порядка
17.00–17.20 (Tomsk)		
13.20–13.40 (Moscow)	<i>Ellada Ibragimova</i>	Об алгоритме кластеризации знакового графа
17.20–17.40 (Tomsk)		

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13.00–14.00 (Moscow) / 17.00–18.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlWFZSzdzdVVMMSG9QTHYxdz09>

13.00–14.00
(Moscow)

Lecture for young scientists «Reconfigurable computing environments for image processing»

Dmitry Shashev, National Research Tomsk State University, Russia

17.00–18.00
(Tomsk)

Moderator: Svetlana Paul, National Research Tomsk State University, Russia

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14.00–15.00 (Moscow) / 18.00–19.00 (Tomsk)

<https://us02web.zoom.us/j/4571137585?pwd=Z3I2SjZtMGFmTERta0VzcGo1c1dUZz09>

14.00–15.00
(Moscow)

Plenary talk «Optimization of Energy Consumption in Computer and Communication Systems»

Erol Gelenbe, Imperial College, London, United Kingdom

18.00–19.00
(Tomsk)

Moderator: Svetlana Paul, National Research Tomsk State University, Russia

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07.00–09.40 (Moscow) / 11.00–13.40 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdZdVVMMSG9QTHYxdz09>

TRACK «Mathematical Teletraffic Theory and Queueing Theory 8»

СЕКЦИЯ «Математическая теория телеграфика и теория массового обслуживания 8»

Working language: Russian, English

Chiefs: **Anatoly Nazarov**, National Research Tomsk State University, Russia

Svetlana Rozhkova, National Research Tomsk State University, Russia

Moderator: **Ekaterina Pavlova**, National Research Tomsk State University, Russia

07.00–07.20 (Moscow)	<i>Maksim Zharkov,</i>	Моделирование переходных процессов на грузовой железнодорожной станции на основе теории массового обслуживания
11.00–11.20 (Tomsk)	<i>Alexander Kazakov, Anna Lempert</i>	
07.20–07.40 (Moscow)	<i>Anna Pavlova, Anatoly Nazarov,</i>	Исследование СМО $M M 1 N-1$ с тремя типами обратной связи методом асимптотически диффузионного анализа
11.20–11.40 (Tomsk)	<i>Ekaterina Pavlova</i>	
07.40–08.00 (Moscow)	<i>Vladimir Zadorozhnyi, Dmitriy</i>	Optimization of message transmission when implementing the secret sharing scheme
11.00–12.00 (Tomsk)	<i>Sagaydak</i>	
08.00–08.20 (Moscow)	<i>T.В. Бушкова, С.П. Мусеева,</i>	Исследование ресурсных систем вида $GI(2, V) + 2M/GI2/\infty$ с параллельным обслуживанием входящих заявок
12.00–12.20 (Tomsk)	<i>Е.В. Панкратова</i>	
08.20–08.40 (Moscow)	<i>Anatoly Nazarov, Tuan Phung-Duc,</i>	Математическая модель тандемной системы $M GI 1 M 1$ с повторными вызовами и общей орбитой
12.20–12.40 (Tomsk)	<i>Svetlana Paul, Mariya Morozova</i>	
08.40–09.00 (Moscow)	<i>A.A. Имомов, Э.Э. Тухтаев,</i>	Об одном критерии сходимости к экспоненциальному закону
12.40–13.00 (Tomsk)	<i>А. Абдурахманов</i>	
09.00–09.20 (Moscow)	<i>Jayesh Karwande</i>	Stabilization of NCS as Switching Systems with Packet Losses by Reduced Norm Feedback Control
13.00–13.20 (Tomsk)		
09.20–09.40 (Moscow)	<i>Tursunov Gafur</i>	Моменты приращений и периода регенерации обобщенных регенерирующих случайных процессов в системе массового обслуживания $M/G/1$ с полумарковским поступлением требований
13.20–13.40 (Tomsk)		

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10.00–12.20 (Moscow) / 14.00–16.20 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlZSzdzdVVMMSG9QTHYxdz09>

TRACK «Telecommunication Networks Modelling»

СЕКЦИЯ «Моделирование телекоммуникационных сетей связи»

Working language: Russian, English

Chiefs: **Alexander Dudin**, Belarusian State University, Belarus

Svetlana Moiseeva, National Research Tomsk State University, Russia

Moderator: **Ekaterina Fedorova**, National Research Tomsk State University, Russia

10.00–10.20 (Moscow)	<i>Anastasia Gorbunova,</i>	Применение методов машинного обучения к решению задач теории массового обслуживания
14.00–14.20 (Tomsk)	<i>Vladimir Vishnevsky</i>	
10.20–10.40 (Moscow)	<i>Андрей Ларионов, А. Соколов, Владимир Вишнеvский</i>	Методика оценки производительности многошаговых беспроводных сетей с помощью открытых сетей массового обслуживания и имитационного моделирования
14.20–14.40 (Tomsk)		
10.40–11.00 (Moscow)	<i>Anastasia Daraseliya,</i>	Resource requirement distribution evaluation for traffic offloading in wireless networks
14.40–15.00 (Tomsk)	<i>Eduard Sopin</i>	
11.00–11.20 (Moscow)	<i>Nargis Ashurmetova, Eduard Sopin</i>	Response time analysis in fog computing system with threshold-based offloading mechanism
15.00–15.20 (Tomsk)		
11.20–11.40 (Moscow)	<i>Nika Ivanova, Vladimir Vishnevsky</i>	Applications of k-out-of-n:G system and machine learning methods on reliability analysis of unmanned high-altitude module
15.20–15.40 (Tomsk)		
11.40–12.00 (Moscow)	<i>Sayfulloyeva Gulnoz</i>	Empirical KAC processes under general random censorship model
15.40–16.00 (Tomsk)		
12.00–12.20 (Moscow)	<i>Dilshod Mansurov</i>	On estimates of the distribution function in informative model of random censorship from both sides
16.00–16.20 (Tomsk)		

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07.00–09.40 (Moscow) / 11.00–13.40 (Tomsk)

<https://us02web.zoom.us/j/4571137585?pwd=Z3I2SjZtMGFmTERta0VzcGo1c1dUZz09>

TRACK «Mathematical and Computer Modelling in Engineering, Natural Science, Economics, Education, Humanities and Other Fields 2» / СЕКЦИЯ «Математическое и компьютерное моделирование в технике, естествознании, экономике, образовании, гуманитарных науках и других областях 2»

Working language: Russian, English

Chiefs: **Anton Voitishek**, Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Russia

Svetlana Moiseeva, National Research Tomsk State University, Russia

Moderator: **Valentina Broner**, National Research Tomsk State University, Russia

07.00–07.20 (Moscow)	<i>I. A. Trofimov</i>	Сравнение вычислительных затрат на основные математические операции с помощью системы NMPUD
11.00–11.20 (Tomsk)		
07.20–07.40 (Moscow)	<i>Irina Gendrina</i>	Расчет интенсивности солнечной дымки в системах видения через атмосферу
11.20–11.40 (Tomsk)		
07.40–08.00 (Moscow)	<i>М.Э. Муминов, А.М. Хуррамов</i>	Спектральные свойства двухчастичного гамильтониана на решетке
11.40–12.00 (Tomsk)		
08.00–08.20 (Moscow)	<i>А.М. Хуррамов, О.Ш. Хуррамов</i>	О числе собственных значений модельного оператора на решетке
12.00–12.20 (Tomsk)		
08.20–08.40 (Moscow)	<i>D.A. Cherkashin</i>	Компьютерное моделирование случайных величин по приближениям их плотностей распределения
12.20–12.40 (Tomsk)		
08.40–09.00 (Moscow)	<i>Jozil Taxirov</i>	О динамике популяций в речной экологии
12.40–13.00 (Tomsk)		
09.00–09.20 (Moscow)	<i>М.О. Абулов, Б.А. Турсунов</i>	Нелокальная задача для одного уравнения четвертого порядка
13.00–13.20 (Tomsk)		
09.20–09.40 (Moscow)	<i>Kh. Sarimsakova</i>	Some inequalities for boundary functionals from random walk
13.20–13.40 (Tomsk)		

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10.00–11.20 (Moscow) / 14.00–15.20 (Tomsk)

<https://us02web.zoom.us/j/4571137585?pwd=Z3I2SjZtMGFmTERta0VzcGo1c1dUZz09>

TRACK «Informational Technologies and Software Engineering»

СЕКЦИЯ «Информационные технологии и программная инженерия»

Working language: Russian

Chiefs: **Alexander Moiseev**, National Research Tomsk State University, Russia

Konstantin Voytikov, Moscow Institute of Physics and Technology, Russia

Moderator: **Alexey Shkurkin**, National Research Tomsk State University, Russia

10.00–10.20 (Moscow)	<i>Alyona Borisovskaya</i>	Применение методов машинного обучения в задачах ранжирования в поисковых информационных системах
14.00–14.20 (Tomsk)		
10.20–10.40 (Moscow)	<i>Sarvar Sharapov</i>	Обзор способов разработки клиентских веб-приложений и преимущества использования Генератора Статичных Сайтов
14.20–14.40 (Tomsk)		
10.40–11.00 (Moscow)	<i>Stepan Gilin</i>	Задача автоматического распознавания зданий в водоохранных зонах на спутниковых снимках
14.40–15.00 (Tomsk)		
11.00–11.20 (Moscow)	<i>Alexander Zorkin,</i> <i>Denis Zmeev</i>	Гибридный алгоритм поиска академического плагиата исходного кода с использованием парсера ANTLR
15.00–15.20 (Tomsk)		

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11.20–12.40 (Moscow) / 15.20–16.40 (Tomsk)

<https://us02web.zoom.us/j/4571137585?pwd=Z3I2SjZtMGFmTERta0VzcGo1c1dUZz09>

TRACK «Data Analysis and Visualization Methods»

СЕКЦИЯ «Методы анализа и визуализации данных»

Working language: Russian

Chiefs: **Alexander Moiseev**, National Research Tomsk State University, Russia

Konstantin Voytikov, Moscow Institute of Physics and Technology, Russia

Moderator: **Ekaterina Lisovskaya**, National Research Tomsk State University, Russia

11.20–11.40 (Moscow)	<i>Daria Bugakova, Ekaterina Lisovskaya</i>	Прогнозирование платежеспособности клиентов банка с использованием методов машинного обучения на данных, отобранных с помощью расчета коэффициентов WoE и IV
15.20–15.40 (Tomsk)		
11.40–12.00 (Moscow)	<i>Eleonora Okoneshnikova</i>	Модификация алгоритма извлечения признаков из ЭКГ сигнала на основе нейронных сетей
15.40–16.00 (Tomsk)		
12.00–12.20 (Moscow)	<i>M. A. Chuliyeva</i>	Interpret correlation statistics of healthy eating in preschool children with correlations
16.00–16.20 (Tomsk)		
12.20–12.40 (Moscow)	<i>Асия Саринова</i>	Дискретно-косинусное преобразование для сжатия гиперспектральных изображений в фитосанитарном контроле зерновых культур
16.20–16.40 (Tomsk)		

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12.30–13.00 (Moscow) / 16.30–17.00 (Tomsk)

<https://us04web.zoom.us/j/8967702999?pwd=bXAwWUVlWFlzSzdzdVVMSG9QTHYxdz09>

12.30–13.00
(Moscow)

Summing up the results of the conference
Подведение итогов конференции

16.30–17.00
(Tomsk)

Online Gala-Dinner
Moderator: **Svetlana Moiseeva**, National Research Tomsk State University, Russia