



**AIES
2022**

ARTIFICIAL INTELLIGENCE

IN ENGINEERING AND SCIENCE

15 - 18 NOVEMBER

PROGRAMME



Ulyanovsk State
Technical
University



Yuri Gagarin
State Technical
University of
Saratov



Al-Farabi Kazakh
National University



Saratov State
Medical University
named after V. I.
Razumovsky



Russian
Association for
Artificial
Intelligence



First International Conference Artificial Intelligence in Engineering and Science – AIES-2022

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PROGRAMME

Ulyanovsk time = MSK+1

Saratov time = MSK+1

Almaty time = MSK+3

Day 1. Tuesday, 15 November 2022

Time MSK	Title / Authors
10:00-10:10	Opening Session
Plenary Section	
<p>Chair: Nadezhda Yarushkina University: Ulyanovsk State Technical university Online https://jit.ulstu.ru/AIES</p>	
10:10-10:40	<p>Keynote speech №1 <i>Hybrid and integrated AI systems</i> Nadezhda Yarushkina</p>
10:40-11:10	<p>Keynote speech №2 <i>Problems and features of the implementation of interdisciplinary research projects using AI technologies</i> Vladislav Kovalnogov</p>
SECTION 1.	
Image and sound processing, image recognition, computer vision	
<p>Chair: Vitaliy Dementiev University: Ulyanovsk State Technical university Online https://jit.ulstu.ru/AIES</p>	
Time MSK	Title / Authors
11:15-11:30	<p>Method for Detecting Person in a Frame of Video Stream and Classifying His Position Using an Artificial Neural Network Alexander Brovko, Svetlana Kumova, Ivan Timohin, Olga Toropova</p>
11:35-11:50	<p>Deep learning approach to recognition of car driver's closed eyes for safety reasons Vitaliy Dementiev, Alexandr Tashlinsky, Konstantin Vasiliev, Nikita Andriyanov</p>
11:50-12:05	<p>Russian Sign Language Recognition Using MediaPipe Yuriy Philippovich, Lyubov Tsilenko, Arifa Ashrafi, Alexey Harlamenkov, Viktor Mokhnachev</p>
12:05-12:20	<p>Deep Machine Learning Techniques in the Problem of Estimating the Expression of Psychological Characteristics of a Social media User Lev Livshits, Maxim Abramov, Anastasiia Khlobystova, Fedor Bushmelev</p>
12:20-12:35	<p>Development of software for managing treadmills based on computer vision Kirill Patutin, Daniil Teselkin, Alexandra Nazarova, Ekaterina Surkova, Artem Obukhov</p>
12:35-12:50	<p>3D artifact localization using connected components Marina Lisnichenko, Stanislav Protasov,</p>

SECTION 2. Study of Artificial Intelligence, Fuzzy models and soft calculations	
Chair: Anton Romanov University: Ulyanovsk State Technical university Online https://jit.ulstu.ru/AIES	
Time MSK	Title / Authors
14:00-14:15	Semantic Modeling of Predicate Calculus Based on N-Tuple Algebra Alexander Fridman, Boris Kulik
14:15-14:30	Preventive Analytics in Safety Tasks for Critical Infrastructures Development Alexander Fridman
14:30-14:45	Method of Iterative-Order Optimization of Multicriteria Problems Using the Local Importance of Criteria Aram Terterian, Alexander Brovko
14:45-15:00	Neural Network Representation for Ordinary Differential Equations Vladimir Kozynchenko, Anna Golovkina
15:00-15:15	Modeling Situations in Spatial Analysis Alexander Bozhenyuk, Marina Belyakova, Stanislav Belyakov, Igor Rozenberg
15:15-15:30	Development of a program code review system using machine learning methods Vadim Moshkin, <i>Ilya Andreev</i>
15:30-15:45	Assessment of the vine--copula for the gamma Poisson model of risky person's behavior with synthetic data Alexander Tulupyev, Valeriia Stoliarova
15:45-16:00	Implementation of the Constraints Principle in Problems of Multicriteria Choice under Conditions of Fuzzy Assignment of Criteria Values Dmitry Vasiliev, Nikita Mityashin, Anna Spivak, Ekaterina Mirgorodskaya
16:00-16:15	Divergence of comparative possibility distributions as a numerical measure of how difficult it is to reach a consensus Andrey Zubyyuk, Michael Yashchenko, Egor Fadeev
16:15-16:30	Production Control based on a Quality Guarantor Computer Vision System Anton Ivaschenko, Vladimir Avsievich, Oleg Golovnin, Margarita Aleksandrova, Pavel Sitnikov

Day 2. Wednesday, 16 November 2022

SECTION 3.

Smart City Technologies and the Internet of Things

Chair: Madina Mansurova

University: Al-Farabi Kazakh National University

Online

Zoom: <https://us02web.zoom.us/j/6760985614?pwd=Z05sZG5lVkJicUZ6RW81R2Y0aU54QT09>

Conference ID: 676 098 5614

Password: 499653

Time MSK	Title / Authors
10:00-10:10	Opening Session
10:10-10:25	Timeliness of Multipath Redundant Transmissions when all Paths are not Accessible for Some Request Sources Stanislav Bogatyrev, Vladimir Bogatyrev, Anatoly Bogatyrev
10:25-10:40	Off-road Autonomous Vehicle Control System Vitaliy Dementiev, Ivan Rubcov, Vladislav Mikhailov, Roman Jhitkov, Daniil Kanin, Kirill Sviatov
10:40-10:55	Adaptive city traffic lights as collective IoT devices Madina Mansurova, Baurzhan Belgibaev, Dusmat Zhamangarin, Nurassyl Zholdas

SECTION 4.

Computational Linguistics and the Semantic Web, Data Mining & Knowledge Representation

Chair: Madina Mansurova

University: Al-Farabi Kazakh National University

Online

Zoom: <https://us02web.zoom.us/j/6760985614?pwd=Z05sZG5lVkJicUZ6RW81R2Y0aU54QT09>

Conference ID: 676 098 5614

Password: 499653

Time MSK	Title / Authors
12:00-12:10	Opening Session
12:10-12:25	Process-semantic analysis of words and texts Ilya Surov
12:25-12:40	Topic modeling algorithm using quantum probability theory Alexey Platonov, Anna Avdyushina, Igor Bessmertny
12:40-12:55	Case-based reasoning and ontology-based approach to selecting equipment solutions in oilfield engineering Igor Glukhikh, Mikhail Pisarev, Dmitry Liss, Anastasia Shestakova, Кристина Нониева
12:55-13:10	Associative classification based on the table constraints satisfaction Alexander Zuenko
13:10-13:25	Extracting Entity Relationship from Arabic texts Alaa Shaker, Igor Bessmertny, Alaa Aldarf
13:25-13:40	A Probabilistic-Statistical Approach to Detection of Semantic Relations between Indexing Terms Irina Kozlova
13:40-13:55	Creating a Metagraph Dataset Based on the ATOMIC Dataset Danila Feduykin, Danila Gromozdov, Yuriy Gapanyuk
13:55-14:10	TableProcessor: the tool for the analysis and the interpretation of web tables to create the Geo Knowledge Base of Kazakhstan Barakhnin Vladimir, Grigorieva Irina, Kozhemyakina Olga, Mansurova Madina, Assel Ospan

SECTION 5. Applied Intelligent Systems

Chair: Alexander Brovko

University: Yuri Gagarin State Technical University of Saratov

Online

Yandex Telemost: <https://telemost.yandex.ru/j/39864029397104>

12:00-12:10	Opening Session
12:10-12:25	Mathematical model for training a neural network used to predict atmospheric pollutants from vehicles Alexander Rezhnikov, Oleg Dranko, Aleksey Bogomolov, Elena Kushnikova, Ekaterina Kusheleva
12:25-12:40	The Concept of Intelligent Support for Laser Additive Manufacturing Process Engineer Yuriy Kulchin, Alexander Nikitin, Andrei Velichko, Artem Basakin, Valeriya Gribova, Vadim Timchenko
12:40-12:55	Socio-economic Sustainability Monitoring based on Intelligent Analysis of Social Media Arkadiy Krivosheev, Evgeniya Dodonova, Irina Dubinina, Anton Ivaschenko, Oleg Golovnin
12:55-13:10	Service-oriented architecture for block-base construction building Ilya Senokosov, Artem Voinov
13:10-13:25	Rule-based Model for Describing the Processes of Rise and Transfer of Anthropogenic Emissions in the Atmosphere Elena Kushnikova, Aleksey Bogomolov, Irina Stepanovskaya, Alexander Rezhnikov, Vladimir Petrov
13:25-13:40	Approach to building an intelligent repository of software projects Julia Stroeveva, Dmitrii Iastrebov, Aleksey Filippov
13:40-13:55	Models and methods for searching cohesive teams of software developers Vladislav Moiseev, Nadezhda Yarushikina, Alex Zhelepov
13:55-14:10	Anomaly Detection in a Granulation Plant for Uranium Dioxide Powder Pressing into Fuel Pellets Viacheslav Kozitsin, Maxim Mezhov, Iurii Katser
14:10- 14:25	Using convolutional neural networks for training forest machine operators Liudmila Steshina, Andrey Glazyrin, Dimiter Velevev, Plamena Zlateva, Igor Petukhov
14:25- 14:40	Artificial intelligence systems in the field of safety at work and life Vadim Zhmud
14:40- 14:55	Ensuring the Robustness of Modern Mechatronic Systems Using Artificial Intelligence Methods Alexey Lvov
14:55- 15:10	Features of Knowledge Representation of Automatic Control Systems Design Methods Mikhail Stepanov

Day 3. Thursday , 17 November 2022

SECTION 6.

Artificial intelligence in medicine and bioengineering

Chair: Alexander Fedonnikov

Co-chairs: Marina Barulina, Tatyana Kaluta

University: Saratov State Medical University named after V. I. Razumovsky

Offline: Saratov, Kutyakova st., 109 (Building 6.1), conference hall.

Online

Time MSK	Title / Authors
10:00 – 10:15	Non-invasive control of blood viscosity and hematocrit (The Possibilities of Artificial Intelligence to Control the Adequacy of Hypovolemia Correction) <i>Oleg Tsarev</i> , Andrey Senin, Nikita Korchakov, Fedor Prokin
10:15 – 10:30	Application of convolutional neural networks in the analysis of microimages of skin neoplasms in the early diagnosis of melanoma Anton Sapunkov, Anastasia Khambikova, Elena Antonova, Gleb Guskov , Nadezhda Yarushikina
10:30 – 10:45	Automated ABSDE image analysis of a skin neoplasm with interpretable results Alexandra Chekina, Sofia Egova, Elena Antonova, Anastasia Khambikova, Nadezhda Yarushikina, Gleb Guskov
10:45 – 11:00	An Overview of Using Deep Learning Algorithms for Anemia Detection Alexander Fedonnikov, Tatyana Kaluta, Ivan Ulitin, Marina Barulina
11:00 – 11:15	Using of Artificial Intelligence in Detection of the Compliance of the ophthalmic patients Olga Dolinina, Alexey Kuzmin, Tatjana Kamenskikh , E Veselova
11:15 – 11:30	Computer analysis of lumbar spine MRI scans via neural network methods and algorithms Vadim Kushnikov, Alexander Selyutin , Olga Dolinina, Stanislav Daurov
11:30 – 11:45	Expert System KORDEX for Solving of Urgent Cardiology Problems Olga Dolinina, Yury Shwartz, Alexandra Kaner
11:45 – 12:00	Building Vertebral Models Using Convolutional Artificial Neural Networks in Preoperative Planning Problems Leonid Bessonov , Dmitry Sidorenko, Dmitry Ivanov, Irina Kirillova, Leonid Kossovich
12:00 – 12:30	Reflection