Massachusetts Institute of Technology
National Aerospace University “Kharkiv Aviation Institute”

Program of
4th International Workshop of IT-professionals on Artificial Intelligence
ProfIT AI 2024
(September, 25-27, 2024)

Cambridge, MA, 2024

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Section 1. Computer Vision

September, 25th, 2025

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

9:00 AM – 10:30 PM (GMT -4)

1. "Semi-supervised European forest types mapping using high-fidelity satellite data", *Bohdan Yailymov, Hanna Yailymova, Nataliia Kussul, Andrii Shelestov*
2. "Efficient small and overlapping target detection in underwater images", *Victor Sineglazov, Mykhailo Savchenko, Volodymyr Lytvynenko*
3. "Microphone Array Spectral Mask Using Artificial Neural Network for Enhancing Minimum Variance Distortionless Response Beamformer", *Quan Trong The*
4. "Intelligent hyperspectral image processing for landmine detection and classification", *Viktor Sineglazov, Kyrylo Lesohorskyi, Volodymyr Lytvynenko*
5. "TU-Net: Transformer based U-Net for left ventricle MRI segmentation", *Amit Pandey, Akansha Singh, Ajith Abraham, Krishna Kant Singh*
6. "Weighted Shifted S-shaped Activation Functions", *Sergiy Popov, Dmytro Pikhulya*

Section 2. Natural Language Processing

September, 25th, 2024

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

10:30 AM – 12:00 PM (GMT -4)

1. "Benchmarking Conversation Routing in Chatbot Systems Based on Large Language Models", *Daniil Maksymenko, Danylo Kryvoshein, Olena Turuta, Dmytro Kazakov, Oleksii Turuta*
2. "The Impact of Stopwords Removal on Disinformation Detection in Ukrainian language during Russian-Ukrainian war", *Halyna Padalko, Vasyl Chomko, Dmytro Chumachenko*
3. "Estimation and Visualization of Webcam Eye Tracking for Text Reading", *Anastasiia Grynenko, Olena Turuta, Ruslan Kasheparov, Olga Kalynychenko, Oleksii Turuta*
4. "Development of an Intelligent Search System using GPT model for GrantsForScience platform", *Oleksandr M. Khimich, Serhii V. Yershov, Elena A. Nikolaevskaya, Pavlo S. Yershov*
5. "Artificial Intelligence-Driven Text-to-Tactile Graphics Generation for Visual Impaired People", *Yehor Dzhurynskyi, Volodymyr Mayik, Lyudmyla Mayik*
6. "Russo-Ukrainian war disinformation detection in suspicious Telegram channels", *Anton Bazdyrev*

Section 3. Intelligent Methods in Healthcare (Part 1)

September, 25th, 2024

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

12:00 AM – 13:30 PM (GMT -4)

1. "The Covid-19 pandemic dynamics and incomes", *Igor Nesteruk, Oleksii Rodionov*
2. "Parallel Optimization of Dimensionality Reduction Methods for Disease Prediction: PCA and LDA with Dask-ML", *Lesia Mochurad, Liliana Mirchuk, Anastasiia Veretilnyk*
3. "A Distributed Classification Method for Real-time Healthcare Data Processing", *Vladislav Kaverinskiy, Oleksandr Palagin, Kyrylo Malakhov*
4. "Multicriteria Linear Assignment Problem in Healthcare Improvement", *Oksana Pichugina, Lyudmyla Kirichenko, Yurii Skob*
5. "Simulation of Influenza Dynamics in Kharkiv Oblast (Ukraine) using ARIMA Model", *Mykola Butkevych, Dmytro Chumachenko*

Section 3. Intelligent Methods in Healthcare (Part 2)

September, 26th, 2024

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

9:00 AM – 10:30 PM (GMT -4)

1. "Explainable Artificial Intelligence: Transitioning DL Model Decisions to User-Understandable Features in Healthcare", *Pavlo Radiuk, Oleksander Barmak, Eduard Manziuk, Iurii Krak*
2. "Mathematical simulations of the pertussis epidemic in England", *Igor Nesteruk*
3. "Uncertainty Estimation Method for Determining Bone Density in Patients with Infiltrating Intraductal Carcinoma Undergoing Anti-Cancer Therapy", *Viktor Reshetnik, Irina Muryzina, Marcus Frohme, Victoriia Alekseeva, Alla Dzyza, Alina Nechyporenko*
4. "Using of Ellipsoid Method and Linear Regression with L1-Regularization for Medical Data Investigation", *Petro Stetsyuk, Viktor Stovba, Ivan Senko, Illya Chaikovsky*
5. "Evaluation of Bone Radiodensity in Smokers", *Alina Nechyporenko, Viktor Reshetnik, Marcus Frohme, Victoriia Alekseeva, Andrii Lupyr, Vitaliy Gargin*

Section 4. Intelligent Systems

September, 26th, 2024

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

10:30 AM – 14:00 PM (GMT -4)

1. "Modelling Hydroecomonitoring of Surface Water in Ukraine Using Machine Learning", *Leonid Bytsyura, Anatoliy Sachenko, Taras Kapusta, Khrystyna Lipianina-Honcharenko, Ruslan Brukhanskyi*
2. "Methodology for an Intelligent System Constructing for Modeling the Conduction of an Electrical Impulse in Nerve Axons", *Michael Z. Zgurovsky, Pavlo O. Kasyanov, Liudmyla B. Levenchuk, Vladyslav R. Novykov*
3. "Adaptive piece-wise linear squashing activation function for deep neural networks", *Yevgeniy Bodyanskiy, Nonna Kulishova, Mykhailo Petrykin, Maxim Kulishov*
4. "Fuzzy Online Bagging Using Adaptive F-transform", *Sergiy Popov, Iryna Pliss, Olexii Holovin, Oleh Zolotukhin, Larysa Chala*
5. "Modeling the Parameters of an Intelligent System as a Combinatorial Optimization Problem", *Liudmyla Koliechkina, Olena Dvirna*
6. "Intelligent Methods in behavioral studies on animal models", *Yevheniia Babenko, Volodymyr Romanov*
7. "Development and Implementation of Intelligent Programming Tool for Agile Transformation of Human Resource Management Processes", *Nataliia Dotsenko, Igor Chumachenko, Oleksandr Skachkov, Yuliia Husieva*
8. "Decision support algorithm in the development of information sensitive socially oriented systems", *Sergiy Yakovlev, Artem Khovrat, Volodymyr Kobziev, Dmytro Uzlov*
9. "Innovative Architectural Development of Corporate Enterprise Administration Systems", *Volodymyr Opanasenko, Serhii Matvieishyn, Vladislav Kaverinskiy*
10. "Numerical Simulation of Kinetic Processes in Thin-layer Electrochemiluminescent Light Emitting Cells", *Danylo Martynov, Yuriy Zholudov, Boris Chichkov, Mykola Slipchenko, Olena Slipchenko, Kyrylo Korobchynskyi*
11. "Mathematical Modeling of Pressure Effects from Hydrogen Explosion", *Yurii Skob, Oleksandr Khimich, Oksana Pichugina, Andrii Hulianytskyi, Oleksii Kartashov*
12. "Development and analysis of the training course "Organization of databases" with AI", *Kyryl Korobchynskyi, Maksym Shapovalov, Viktoriia Seredenko*
13. "Development of Intelligent Nutrition Surveillance System with OpenAI API", Vadym Yevtushenko, Kyrylo Rukkas, Tetyana Chumachenko

Section 5. Artificial Intelligence Ethics, Policy and Governance

September, 27th, 2024

Offline: Massachusetts Institute of Technology, CSAIL

Online: Zoom link

9:00 AM – 10:00 PM (GMT -4)

1. “Trustworthy AI systems from untrustworthy components: development von Neumann’s paradigm using principle of diversity”, *Vyacheslav Kharchenko, Oleg Odarushchenko*
2. “Representation of Trustworthiness Components in AI Systems: A Formalized Approach Considering Interconnections and Overlap”, *Eduard Manziuk, Oleksandr Barmak, Pavlo Radiuk, Vladislav Kuznetsov, Iurii Krak*
3. “Towards Ontology-Related Support for Transdisciplinary Research”, *Mykola Petrenko, Mykola Boyko, Sergii Kotlyk, Kyrylo Malakhov*
4. “Handling outliers in swarm algorithms: a review”, *Dmytro Uzlov, Yehor Havryliuk, Ivan Hushchyn, Volodymyr Strukov, Sergiy Yakovlev*