MELNIKOV IGNAT

Researcher, Analyst, Programmer

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SKILLS

C/C++: Boost, NS-3 (Network Simulator)
Python: NumPy, Pandas, Matplotlib, SciPy, PyTorch
Unix: System 5, POSIX
Multithreaded Programming: OpenMP, MPI, Linux Threads
Golang, Web Development
R, Linear Analysis
Languages: Russian (native), English (fluent)

EDUCATION

Skolkovo Institute of Science and Technology / New Economic School / Moscow Institute of Physics and Technology

Double degree program

2023 – present Moscow, Russia

Master of Mathematics and Computer Science
Department of Data Science (Skoltech) and Phystech School of Applied Mathematics and Informatics
Fintech track jointly with *New Economic School (NES)*

Moscow Institute of Physics and Technology

2019 – 2023 Moscow, Russia

Bachelor of Applied Mathematics and Physics
Department of Radio Engineering and Cybernetics
GPA: **4.97** (out of 5.0), **Diploma with honors**

RESEARCH/WORK EXPERIENCE

T-Bank (ex. Tinkoff), Data Monetization in Investments

Jun 2024 – Present Moscow, Russia

- **Product Analyst**

Sberbank, Blockchain Laboratory

Feb 2024 – May 2024 Moscow, Russia

- **R&D Engineer** at the Blockchain Laboratory.
- Decentralized Finance, Risk Assessment

Institute for Information Transmission Problems of the Russian Academy of Sciences (Kharkevich Institute)

Jun 2021 – Sep 2023 Moscow, Russia

- **R&D Engineer** at the Laboratory for Transmission, Protection and Analysis of Information.
- **Bachelor research project:** Design of decoders for LDPC codes with the construction of a subtraction table that maximizes mutual information. Supervisor: Kreschuk A.

ACHIEVEMENTS

- **Scholarship** of Abramov and Frolov fund for excellent academic results
- **Best poster presentation** at the conference Information Technologies and Systems 2022
- **Winner diploma** at the 65th MIPT conference
- **Winner** of the Regional stage of the All-Russian Olympiad for schoolchildren in Physics

PUBLICATIONS[link]

- **Melnikov I.**, Lebedeva I., Petrov A., Yanovich Y. *DeFi Risk Assessment: MakerDAO Loan Portfolio Case* // The International Conference on Blockchain Research and Applications Hangzhou, China // Blockchain: Research and Applications. Accepted for publication[link].
- **Melnikov I.**, Kreschuk A., Kureev A. *Reducing the complexity of the decoder of LDPC codes with a Flooding schedule built on the basis of Information Bottleneck* // "Information Technologies and Systems 2022". Moscow: IITP RAS, 2022. DOI: 10.53921/itas2022_700 Published in Russian.
- Uglovskii, A., **Melnikov I.**, Alexeev, I., Kureev, Alexey. (2024). *Effective Error Floor Estimation Based on Importance Sampling with the Uniform Distribution.* Problems of Information Transmission. 59. 217-224. 10.1134/S0032946023040014.

PROJECTS

Reduction of Dimensionality through Active Subspaces approach[link]

- To identify the dimension of a manifold, the active subspace method is used, which is extended through the use of deterministic kernels and diffusion neural networks.

Skills: Python, Generative models (VAE and Diffusion)

Few Shot Generative Classification[link]

- Algorithms for extracting features from generative models are proposed and the idea of building a "few shot" classifier is proposed on their basis.

Skills: Python, Generative models (VAE and Diffusion)

Distributed calculation of integrals[link]

- Fault-tolerant, distributed calculation of integrals on multiple computers

Skills: C, Unix, Make, Computer Networks

More on my GitHub

TECHNICAL SKILLS

- **Machine learning:** Classical machine learning, neural networks, VAE models
- **Probability Theory:** Brownian motion
- **Economics:** Microeconomics, Econometrics
- **Coding Theory:** Algebraic codes, Iterative decoding, LDPC, Information Bottleneck Decoder, Density evolution
- **Wireless networks:** Aloha, Wi-Fi, Bianchi model

COURSES

- C/C++, ILab (Intel)
- Unix, POSIX and System 5, Virtuozzo and MIPT
- Computer networks, Cisco
- Developing web services in Golang, VK Education