

# KIRILL ZAKHAROV

AI/ML Researcher, AI/ML Engineer, Applied Mathematician

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🔖 ResearchGate    🏠 GitHub    🌐 Google Scholar    🆔 Orcid    🌐 Habr

## EDUCATION

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Bachelor of Science in Applied Mathematics and Informatics

**SPbSUE**

📅 Sept 2018 – June 2022

Master of Science in Financial Technologies of Big Data

**ITMO**

📅 Sept 2022 – June 2024

PhD in Artificial Intelligence and Machine Learning

**ITMO**

📅 Sept 2024 – present

## EXPERIENCE

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### • Machine Learning Researcher

- Research in generative AI for time series and tabular data, and CV.
- Research in physics-informed neural networks and dynamical systems.
- Publication of scientific articles in academic journals in the Q1 rank. Participation in international conferences.

**ITMO University, Russia**

📅 2022 – present

### • Machine Learning Researcher

- Developing a method for the generation of synthetic time series data.
- Developing a method for the generation of synthetic transactional data with differential privacy.
- Jump diffusion stochastic processes modelling based on neural stochastic differential equations in financial tasks.

**SBER**

📅 2022 – 2025

### • Machine Learning Engineer

- Deposit duration forecasting.

**Bank Saint Petersburg**

📅 2023 – 2024

## SKILLS

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- Classical and Advanced Machine Learning
- Deep Learning (CV, NLP)
- Generative Models: GANs, Normalizing Flows, Diffusion Models, VAEs, Neural SDE Flows
- Physics-Informed AI: PINNs, NeuralODEs, NeuralSDEs
- Dynamical Systems: ODEs, PDEs in Finance, Complex Systems, Operator Theory, SDEs
- Stochastic Calculus and Measure Theory in Finance and AI: SDEs, stochastic integrals, stochastic processes, Itô calculus
- Derivative Pricing: forwards, options pricing, measure change, binomial model, non-parametric methods, computational finance
- Optimization Methods and Numerical Analysis: NN training algorithms, numerical derivative pricing, linear programming, portfolio optimization
- Academic Writing: Journal Articles, Conference Proceedings
- Programming Languages: Python, C, SQL, Wolfram Mathematica, LaTeX
- Frameworks/Libraries: Pytorch, Tensorflow, Keras, NumPy, Pandas, Scikit-learn, docker, Git, OpenCV, NLTK

## PUBLICATIONS

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- [1] Kirill Zakharov. "Multivariate Time Series Modelling with Neural SDE Driven by Jump Diffusion". In: *International Conference on Computational Science*. Springer. 2024, pp. 213–221.
- [2] Kirill Zakharov, Anton Kovantsev, and Alexander Boukhanovsky. "Coupling of Lagrangian Mechanics and Physics-Informed Neural Networks for the Identification of Migration Dynamics". In: *Smart Cities* 8.2 (2025), p. 42.
- [3] Kirill Zakharov and Elizaveta Stavinova. "Time-dependent differential privacy for enhanced data protection in synthetic transaction generation". In: *Proceedings of the 2024 13th International Conference on Software and Computer Applications*. 2024, pp. 112–117.
- [4] Kirill Zakharov, Elizaveta Stavinova, and Alexander Boukhanovsky. "Synthetic financial time series generation with regime clustering". In: *J. Adv. Inf. Technol* 14.6 (2023).
- [5] Kirill Zakharov, Elizaveta Stavinova, and Anton Lysenko. "TRGAN: A Time-Dependent Generative Adversarial Network for Synthetic Transactional Data Generation". In: *Proceedings of the 2023 7th International Conference on Software and e-Business*. 2023, pp. 1–8.
- [6] Kirill Zakharov et al. "Forecasting Population Migration in Small Settlements Using Generative Models under Conditions of Data Scarcity". In: *Smart Cities* 7.5 (2024), pp. 2495–2513.

## PREPRINTS AND OTHER MATERIALS

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- Mathematical analysis of break-even points and return bounds for option strategies, 2024, doi: 10.13140/RG.2.2.15945.76649
- Optimisation methods. Theorems, 2023, doi: 10.13140/RG.2.2.36071.01440
- Option pricing modelling based on stochastic differential equations, 2022, doi: 10.13140/RG.2.2.13255.37280
- Spherical and Elliptical distributions, 2021, doi: 10.13140/RG.2.2.15639.24484

## CONFERENCES

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- ICCS, Málaga, Spain, 2024
- ICSCA, Bali, Indonesia, 2024
- ICCSIT, Paris, France, 2023
- ICSeB, Osaka, Japan, 2023
- CMY, Saint Petersburg, Russia, 2025
- CMY, Saint Petersburg, Russia, 2024
- CMY, Saint Petersburg, Russia, 2023

## COURSES/CERTIFICATES

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- OpenCV Bootcamp, OpenCV University, 2025
- Computer Vision and Image Processing, ITMO, OpenEdu, 2023
- AI Frontiers, ITMO, Saint Petersburg, 2023
- Pricing Options with Mathematical Models, Caltech, Coursera, 2022
- Stochastic Processes, HSE, Coursera, 2022
- Probability Theory, CSC, Stepik, 2022

## COMPETITIONS

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- 1th place – ITMO HACK FinTech case, 2022
- 5th place – Rosneft Hackathon, 2022
- 3th place – GPN CUP Data Science, 2021