George Nigmatulin

Oxford, United Kingdom
Email: george.nigmatulin@gmail.com
Website: https://george-nigmatulin.github.io/ LinkedIn: https://www.linkedin.com/in/george-nigmatulin/

EDUCATION

University of Oxford (Oxford, United Kingdom). Oct 2024 – Jun 2028 (exp.)
Machine Learning Research Group, Quantitative Finance Stream / Department of Engineering Science.
- PhD, Doctoral degree of Philosophy in Engineering, Supervisors: Professor Stefan Zohren and Jakob Foerster
- Scholarship: ESRC Grand Union Doctoral Training Partnership (DTP) Data Skills Studentship
- Project: "Generative AI for Financial Data: From Price-Impact Consistency to Reinforcement Learning Driven Trading"

Moscow Institute of Physics and Technology (Moscow, Russia) Sep 2020 – Jun 2022
The Phystech School of Applied Mathematics and Computer Science.
- Master's degree in applied mathematics and physics / GPA 4.8 out of 5.0 for 2 years, top 5% of the class.
- Graduation project: "Anomaly Detection-Aided Active Learning on smartwatches data"

Orenburg State University (Orenburg, Russia) Sep 2016 – Jun 2020
Department of Math and information technology.
- Bachelor's degree in applied mathematics and computer science / GPA 5.0 out of 5.0 for 4 years, top 1% of the class.
- Graduation project: "Research of machine learning models for predicting and optimizing ATM service"

WORK EXPERIENCE

British Open-ended Learning and Discovery Lab (Oxford, United Kingdom) Oct 2024 – Present
Doctoral Researcher / Generative AI and Reinforcement Learning for High-Frequency Trading.
- Generative AI models of limit order books for simulating high-frequency markets.
- LOB-Impact Benchmark for market impact validation in generated markets (ICAIF 2026, oral, first author).
- RL agents for trading: JaxMARL-HFT, GPU-accelerated multi-agent RL for HFT (ICAIF 2025, Honourable Mention).

Samsung R&D Institute (Remote, South Korea) Jul 2021 – Sep 2024
Machine Learning Engineer / Sensor Solution Team.
- Developed Sweat loss estimation algorithm. Accelerometer-based Neural Network estimates running distance (MAPE=7.7%, R2=0.95) and Polynomial Kernel Ridge Regression estimates the loss in ml (RMSEBWP=0.3%, R2=0.79).
- Developed body composition models (fat, muscle, water), released in Samsung Galaxy Watch 4.
- Developed Body Temperature algorithm. SVM on perfusion signals detect heat (Accuracy=0.91, F1=0.87) and Ridge Regression estimates the core temperature in ℃ (MSE=0.19, R2= 0.77). Best performance among competitors.

Skolkovo Institute of Science and Technology (Moscow, Russia) Aug 2020 – Jul 2022
Machine Learning Researcher / Laboratory of applied research for structured data statistics.
- Developed an active learning algorithm modified by anomaly detection for planning experiments. The number of required labeling has been reduced by 58%, the quality of the regression model has been improved by 19%
- Researched uncertainty scores (total, data, knowledge) using Bayesian tree ensembles and anomaly detection.

Bank Orenburg (Orenburg, Russia) Jun 2019 – Jul 2020
Analyst, Data Scientist / Information technology Department.
- Forecasted the ATM daily cash demands based on Triple Exponential Smoothing, ARIMA, Neural Networks, SSA
- Developed an optimal ATM cash management model using dynamic programming, increasing profitability by 30%.

SKILLS

- **Languages:** English (Advanced C1), Russian (Native), French (Basic)
- **Programming Languages**: Python, R, C++ / C#, Matlab, Mathcad, Octave, SQL
- **DevOps:** Linux, Bash**,** SSH, Git, DVC, Hadoop, Docker, AWS, Cookiecutter, WandB, MLFlow

QUANTITATIVE RESEARCH TOOLKIT

- **ML packages**: Scikit-learn, SciPy, XGBoost, SHAP, CausalML, Prophet, Numpy, Pandas, Plotly, Matplotlib
- **Deep Learning** TensorFlow, PyTorch, JAX, Gymnasium, Gymnax
- **Finance:** Yfinance, Statsmodels, Tsfresh, FinancePy, Pyfolio, VectorBT, Backtrader, Quantstats, Interactive Brokers
- **Area of specialization**: GenAI, Reinforcement Learning, Systematic Trading, High Frequency Trading.

EXTRACURRICULAR ACTIVITIES

- Obtained professional qualification of a Financial Quantitative Analyst (Moscow State University, Sep 2022 – Jan 2023)
- Published 12 scientific articles, 1 patent in the field of Machine learning, performed at 4 conferences, 8 university schools
- Head of the Student Council (Jan 2018 – Apr 2020)
- Organized international leadership forums: "Japan-Russia youth summit" (Tokyo), "Eurasia Global" (Orenburg), "AEGEE".

PUBLICATIONS

- “LOB-Impact Benchmark: Emergent Market Impact in Generative Limit Order Book Models.” [ICAIF 2026, oral].
- “Understanding the Inner Workings of a State-Space Foundation Model for Limit Order Books.” [ICAIF 2026].
- Mohl, V., Frey, S., Leyland, R.*, Li, K., Nigmatulin, G., Cucuringu, M., Zohren, S., Foerster, J., & Calinescu, A. JaxMARL-HFT: GPU-Accelerated Large-Scale Multi-Agent Reinforcement Learning for High-Frequency Trading. ICAIF 2025.
- Nigmatulin, G, K Pavlov and A Zaytsev. 2022. "Anomaly detection aided Active Learinng." GLOBECOM 2023 - 2023 IEEE Global Communications Conference. https://ieeexplore.ieee.org/abstract/document/10437856
- Pavlov, K, Perchik, A., Nigmatulin, G., Tsepulin, V., Megre, G., Nikolaev, E., Volkova, E., L, HJ., L, WS., and K, YH. 2022. "Sweat loss estimation algorithm for smartwatches". IEEE Access, https://ieeexplore.ieee.org/abstract/document/10061707
- Volkova, E., Nigmatulin, G., Pavlov, K., Beliaev, K., Perchik, A., Lychagov, V., Nikolaev, E., Ayuev, A., Lee, HJ., Lee, WS., & Kim, YH. 2022. Body temperature algorithm for wearable devices (Patent No. WR-202210-007-1-RU0).
- Nigmatulin, G, and O Chaganova. 2021. "Research of an Optimization Model for Servicing a Network of ATMs and Information Payment Terminals." Communications in Computer and Information Science, Springer. https://arxiv.org/abs/2210.09927.
- Bolodurina, I, G Nigmatulin, and D Parfenov. 2020. "Intersection of Triangles in Space Based on Cutting Off Segment." Communications in Computer and Information Science, Springer. https://arxiv.org/abs/2210.15472.
- Nigmatulin, G. 2019. "Predicting Study Time in an Online Course System Based on Machine Learning Methods." In Book of Abstracts for the School-Conference "Invitation to Dynamical Systems, 2020". Higher School of Economics. https://cupdf.com/document/book-of-abstracts-higher-school-of-economics-according-to-3-4-for-any-gradient-like.html?page=1
- Nigmatulin, G, and I Bolodurina. 2019. "Comparative Analysis of the Methods of Training Recurrent Neural Network (Rus.). Step into Science, no. 2: 50-52. https://www.elibrary.ru/item.asp?id=41105398
- Nigmatulin, G, D Parfenov, I Bolodurina, and Zaporozhko. V. 2019. "Solving the Problem of Categorical Regression Using Neural Networks and Gradient Boosting to Predict the Academic Performance at MOOCS (Rus.)." In University Complex as a Regional Center of Education, Science and Culture, 1529-33. https://elibrary.ru/item.asp?id=42532268
- Parfenov, D, G Nigmatulin, V Zaporozhko, and L Zabrodina. 2019. "Prototype of the Module for the Intelligent Formation of an Individual Educational Trajectory of a Student for a Digital Platform. https://www.elibrary.ru/item.asp?id=42587112
- Shchepacheva, N, and G Nigmatulin. 2018. "Analysis of the Company's Activities Based on Chaos Theory (Rus.)." Step into a Science, no. 3: 35-38. https://www.elibrary.ru/item.asp?id=38564592

SCIENTIFIC UNIVERSITY SCHOOLS

- ML2R Autumn School (The Competence Center Machine Learning Rhine-Ruhr, Germany, Oct 2021)
- Gaussian Process Summer Schools 2021 (Sheffield, England, Sep. 2021)
- Machine Learning Summer Schools, MLSS (Taipei, Taiwan, Aug. 2021)
- Neuromatch Academy Deep Learning (Europe-Africa, Aug. 2021)
- ACM Europe Summer School on HPC Computer Architectures for AI and Dedicated (Barcelona, Spain, Aug 2021)
- Regularization Methods for Machine Learning (Machine Learning Genoa Center, Italy. Jun 2021)
- Fall math school of Ehime University (Matsuyama, Japan. Nov 2018).

MASSIVE OPEN ONLINE COURSES (MOOCS)

- Quantitative Finance & Algorithmic Trading in Python (Udemy, Issued Sep 2022)
- Deep Learning Specialization (DeepLearning.Al, Coursera, Issued May 2021)
- Bayesian Methods for Machine Learning (Higher School of Economics, Coursera, Issued Apr 2021)
- Introduction to Machine Learning in Production (MLOps) (DeepLearning.AI, Coursera, Issued Feb 2022)
- Machine Learning (Stanford University, Coursera, Issued Mar 2021)
- Crash Course on Python (Google, Coursera, Issued Mar 2021)
- Graph theory (Moscow Institute of Physics and Technology, Coursera, Issued May 2021)
- Modern combinatorics (Moscow Institute of Physics and Technology, Coursera, Issued Apr 2021)
- Emotional and Social Intelligence (Davis University of California, Coursera, Issued Dec 2021)
- The Science of Well-Being (Yale University, Issued Jan 2022).

HACKATHONS & CASE CHAMPIONSHIPS

- Hackathon “Junction” (November 2020 & 2021, Online)
- Hackathon “Breakpoint” (March 2019, Ufa)
- Hackathon “Digital breakthrough” semi-final (June 2019, Samara)
- Hackathon “Digital breakthrough” hackathon-final (September 2019, Kazan)
- Case championship «McKinsey Diving» (March 2020, Online)
- Case championship «Changellenge Cup Russia 2020» (April 2020, Online).

VOLUNTEERING

- International youth educational forum “Eurasia global”, (August 2018 & 2019, Orenburg, Accompanying international speakers & VIP guests)
- First Eurasian Digital conference (September 2018, Orenburg, Technical support)
- Certificate of inclusive volunteering “Abilimpix” (May 2018, Orenburg, Training course of helping people with disabilities)
- “Children – our future” (2016 - 2022 Orenburg, Help for orphanage).