Artem Riabinin

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About me

I am a PhD student working on optimization for machine learning, deep learning, and federated learning at King Abdullah University of Science and Technology (KAUST), advised by professor Peter Richtárik. My past research has focused on numerical methods and inverse ill-posed problems, with applications in processing images from laser radars.

Interests

Mathematical and Algorithmic Foundations of Machine Learning, Optimization for Machine Learning and Deep Learning, Federated Learning, Numerical Methods, Inverse and Ill-Posed Problems.

Education

King Abdullah University of Science and Technology (KAUST) **Jan. 2025 – Present**
PhD *in Applied Mathematics and Computer Science* *Thuwal, Saudi Arabia*

King Abdullah University of Science and Technology (KAUST) **Aug. 2023 – Dec. 2024**
MSc *in Applied Mathematics and Computer Science* *Thuwal, Saudi Arabia*
GPA: 4.00/4.00.
Main courses: Deep Learning, Machine Learning, SGD Methods, Online Learning, Numerical Linear Algebra, Design and Analysis of Algorithms.
Topic: Optimization for Machine Learning, group of professor Peter Richtárik.

Lomonosov Moscow State University (MSU) **Sep. 2019 – May 2023**
BSc *in Physics and Applied Mathematics* *Moscow, Russia*
GPA: 4.88/5.00.
Main courses: Numerical Methods, Functional Analysis, Probability Theory and Statistics, Stochastic Processes.
Thesis: On the matching of regularization parameters with different types of measurement data errors.

Work Experience

AI/ML Internship at Aramco **Jun. 2024 – Aug. 2024**
ML Engineer Intern *Dhahran, Saudi Arabia*
During my internship at Aramco, I enhanced permeability modeling in reservoir simulations by applying different machine learning techniques, including semi-supervised co-training algorithms, encoder-decoder architectures, and data augmentation strategies—boosting the correlation coefficient between predicted and actual permeability values from 80% to 84%.

Laboratory of Image Processing at Lomonosov Moscow State University **Sep. 2021 – May 2023**
Laboratory assistant *Moscow, Russia*
The result of my work within a group led by Professor Anatoly Yagola is presented in my Bachelor's thesis, which compares different regularization methods for solving image processing problems.

Publications and Preprints

A Novel Unified Parametric Assumption for Nonconvex Optimization **2025**
Artem Riabinin, Ahmed Khaled, Peter Richtárik
Under review for ICML 2025.

Communication-efficient Algorithms Under Generalized Smoothness Assumptions **2024**
Sarit Khirirat, Abdurakhmon Sadiev, Artem Riabinin, Eduard Gorbunov, Peter Richtárik
NeurIPS 2024 Workshop, GitHub Repository.

Educational and Personal Projects

• **NanoGPT with JAX** • **MgNet implementation** • **Accelerated SCO methods via Optimism**

Technical Skills

Programming: Python (multiple projects), MATLAB, C++; university projects with R, SQL
Python Libraries: NumPy, SciPy, Pandas, SciKit-Learn, PyTorch, JAX, Flax, XGBoost
Software: Jupyter Notebook, VS Code, Git, LaTeX, Beamer