

# Nikita Kiselev

Moscow, Russia

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*Check my Resume (one-page version)*

## Curriculum Vitæ

### SUMMARY

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Aspiring researcher (1+ year of research experience) in the field of machine learning and optimization. Focused on generative diffusion and multimodal models. Motivated for productive work and learning. Having a substantial theoretical foundation and mathematical background.

#### Professional Skills

1. **Generative AI:** diffusion models, text2image, image2image, controllable generation (ControlNet), adapters (IP-Adapter, Face-Adapter), style transfer, instruction-based image editing, image quality assessment.
2. **Computer Vision:** medical images reconstruction and forecasting (fMRI, EEG).
3. **Optimization:** sample size determination, loss landscape, decentralized optimization.

### EDUCATION

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**Moscow Institute of Physics and Technology**

*MSc in Computer Science*

**Moscow, Russia**

*Sep 2024 – Present*

**Moscow Institute of Physics and Technology**

*BSc in Applied Mathematics and Physics*

**Moscow, Russia**

*Sep 2020 – Aug 2024*

○ Thesis: Bayesian Sample Size Estimation

○ Advisor: Andrey Grabovoy, PhD

○ GPA: 4.88/5 (with honours)

### WORK EXPERIENCE

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**Sber AI**

*Middle Data Scientist*

Kandinsky Video Editing

**Moscow, Russia**

*Jan 2025 – Present*

*Research Intern*

*Jun 2024 – Dec 2024*

Kandinsky Image Editing:

- Interior Design with Kandinsky 3 ControlNet for Domclick. Fine-tuned ControlNet on the interiors domain, implemented regional prompting for arbitrary segmentation masks and utilized ControlNet image2image editing.
- Kandinsky 3 ControlNet Style (DepthPro) that outperforms ControlNet Union SDXL by 100% on ImageReward. Trained ControlNet over 300k steps on the 3M dataset, used DepthPro condition for the best image preserving and style editing.

**Research Center for Artificial Intelligence, Innopolis University**

*Mathematician-programmer*

**Innopolis, Russia**

*Sep 2024 – Present*

○ Research work in the field of optimization

**Laboratory of Mathematical Methods of Optimization, MIPT**

*Technician*

**Moscow, Russia**

*Oct 2023 – Apr 2024*

- Research work in the field of optimization
- Decentralized optimization with coupled constraints
- Network design problem

## PUBLICATIONS

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### Published Papers: 1 × Q1.....

1. D. Dorin, N. Kiselev, A. Grabovoy, V. Strijov  
Forecasting fMRI Images From Video Sequences: Linear Model Analysis  
Health Information Science and Systems, Q1

### Accepted Papers: 2 × Q2.....

1. N. Kiselev, A. Grabovoy  
Unraveling the Hessian: A Key to Smooth Convergence in Loss Function Landscapes  
Accepted to the Doklady Mathematics journal, Q2
2. N. Kiselev, A. Grabovoy  
Sample Size Determination: Likelihood Bootstrapping  
Accepted to the Computational Mathematics and Mathematical Physics journal, Q2

### Papers under Review & Preprints: 1 × A\*, 1 × Q3.....

1. D. Yarmoshik, A. Rogozin, N. Kiselev, D. Dorin, A. Gasnikov, D. Kovalev  
Decentralized Optimization with Coupled Constraints  
Submitted to the **ICLR 2025** conference with average rating 6.25, A\*
2. N. Kiselev, A. Grabovoy  
Sample Size Determination: Posterior Distributions Proximity  
Submitted to the Computational Management Science journal, Q3

### Conference Theses.....

1. N. Kiselev, A. Grabovoy  
Determining a sufficient sample size based on the a posteriori distribution of model parameters  
Proceedings of the 66th MIPT All-Russian Scientific Conference
2. D. Dorin, N. Kiselev, A. Grabovoy  
Spatial and temporal methods of time series analysis  
Proceedings of the 66th MIPT All-Russian Scientific Conference

## POSTER SESSIONS

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- October 21, 2024  
Spatio-Temporal fMRI Analysis in Visual Stimuli Decoding: Linear Model Forecasting & Voxel Weighing  
Neuroinformatics 2024

## TALKS

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- April 6, 2024  
Determining a sufficient sample size based on the a posteriori distribution of model parameters  
66th MIPT All-Russian Scientific Conference

## TEACHING

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### Diffusion Models

Lecturer

**SBER University**

Nov 2024 – Present

- Implementation details. DDIM, noise schedulers, guidance overexposure, noise offset, multiple text encoders, transformer-based diffusion models, MM-DiT.
- Video diffusion models. Deforum, AnimateDiff, MotionLora, StableVideo, CogVideoX.

- Neural network optimization, regularization: lecture, seminar
- Weights initialization, normalization, CNN: lecture, seminar

## PROJECTS

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- **Just Relax It — Discrete Variables Relaxation**

A cutting-edge Python library designed to streamline the optimization of discrete probability distributions in neural networks, offering a suite of advanced relaxation techniques compatible with PyTorch.

- **Models of epidemic spread, in particular COVID-19 as a model of stochastic chemical kinetics**  
Various approaches to modeling the spread of epidemics, differential equations and Markov processes
- **Optimization methods for quadratic problems with large dimensionality**  
Comparison of different methods of solving high-dimensional linear regression problems
- **Intelligent Presentation Generator**  
Application for generating presentations based on text files using topic modeling

## ACHIEVEMENTS

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- **Fall 2024-2025:**
  - K.V. Rudakov scientific academic scholarship for research activities in the field of applied mathematics
  - Personal scholarship for contributions to the development of numerical optimization methods
  - Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Spring 2023-2024:**
  - Personal scholarship for contributions to the development of numerical optimization methods
- **Fall 2023-2024:**
  - K.V. Rudakov scientific academic scholarship for research activities in the field of applied mathematics
  - Personal scholarship for contributions to the development of numerical optimization methods
- **2020-2023:**
  - Abramov scholarship for 1-3 year bachelor students with the best grades at MIPT

## CERTIFICATIONS

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- **Statistics for data analysis**  
Coursera, Issued Jan 2022, Credential ID KAQRGNCQJ8AH
- **Unsupervised learning**  
Coursera, Issued Jan 2022, Credential ID 3CTYTEFT48FM
- **Supervised learning**  
Coursera, Issued Jan 2022, Credential ID 2ZBSN8L7EAVV
- **Mathematics and Python**  
Coursera, Issued Oct 2021, Credential ID CSTTGDM8RF2V

## SKILLS

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- **DL:** PyTorch, Huggingface, Accelerate, Multi GPU training: DDP/FSDP, W&B, TensorBoard
- **ML:** NumPy, SciPy, Pandas, NetworkX, Scikit-learn, LightGBM, CatBoost
- **OS:** macOS, Linux, Windows
- **Misc.:** Git, Bash, L<sup>A</sup>T<sub>E</sub>X
- **Soft Skills:** responsible, organized, critical thinker, flexible, communicative, team player, patient

## LANGUAGES

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- Russian (Native)
- English (Advanced)

## INTERESTS

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- Gym
- Guitar