Nikita Kiselev

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Check my Resume (one-page version)

Curriculum Vitæ

SUMMARY

Aspiring researcher (2+ years 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, text-to-video, image-to-video, text-to-image, image-to-image, alignment (SFT, RL), 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

Moscow Institute of Physics and Technology — **Moscow, Russia**
MSc in Computer Science — *Sep 2024 – Present*

Moscow Institute of Physics and Technology — **Moscow, Russia**
BSc in Applied Mathematics and Physics — *Sep 2020 – Aug 2024*

- Thesis: Bayesian Sample Size Estimation
- Advisor: Andrey Grabovoy, PhD
- GPA: 4.88/5 (with honours)

WORK EXPERIENCE

Sber AI — **Moscow, Russia**
Middle Deep Learning Researcher — *Jan 2025 – Present*

Kandinsky 4.1 (text-to-image, text-to-video, image-to-video):

- Performed text-to-image SFT via innovative LoRA-Soup technique, significantly improved image generation quality.
- Text-to-video LoRA fine-tuning for Russian culture code. Trained 70+ LoRA adapters on different characters, distilled them into text-to-video generation of Kandinsky 4.1.
- Image-to-video generation of Kandinsky 4.1. Developed a new architecture and trained the model maintaining structural dynamics.

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 — **Innopolis, Russia**
Mathematician-programmer — *Sep 2024 – Present*

- Research work in the field of optimization

Laboratory of Mathematical Methods of Optimization, MIPT **Moscow, Russia**
Technician *Oct 2023 – Apr 2024*

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

PUBLICATIONS

Published Papers: 1 × A*, 1 × Q1, 2 × Q2, 1 × Q3, 1 other

1. D. Yarmoshik, A. Rogozin, N. Kiselev, D. Dorin, A. Gasnikov, D. Kovalev
   Decentralized Optimization with Coupled Constraints
   ICLR 2025, **A***
2. D. Dorin, N. Kiselev, A. Grabovoy, V. Strijov
   Forecasting fMRI Images From Video Sequences: Linear Model Analysis
   Health Information Science and Systems, **Q1**
3. N. Kiselev, A. Grabovoy
   Unraveling the Hessian: A Key to Smooth Convergence in Loss Function Landscapes
   Doklady Mathematics, Q2
4. N. Kiselev, A. Grabovoy
   Sample Size Determination: Likelihood Bootstrapping
   Computational Mathematics and Mathematical Physics, Q2
5. N. Kiselev, A. Grabovoy
   Sample Size Determination: Posterior Distributions Proximity
   Computational Management Science, Q3
6. V. Meshkov, N. Kiselev, A. Grabovoy
   ConvNets Landscape Convergence: Hessian-Based Analysis of Matricized Networks
   Ivannikov ISPRAS Open Conference 2024

Conference Theses

1. N. Kiselev, A. Grabovoy
   Loss landscape convergence as a sufficient sample size property
   Proceedings of the 67th MIPT All-Russian Scientific Conference
2. V. Meshkov, N. Kiselev, A. Grabovoy
   ConvNets landscape convergence: Hessian-based analysis of matricized networks
   Proceedings of the 67th MIPT All-Russian Scientific Conference
3. 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
4. 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

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

TALKS

- April 5, 2025
  Loss landscape convergence as a sufficient sample size property

67th MIPT All-Russian Scientific Conference

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

TEACHING

Diffusion Models — **Standard Data × Sber University**
Lecturer — *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, Wan.

Deep Learning — **Moscow Institute of Physics and Technology**
Lecturer — *Sep 2024 – Present*

- Optimization, Regularization: lecture, seminar
- Initialization, Normalization, CNN: lecture, seminar

PROJECTS

- **HippoTrainer: Gradient-Based Hyperparameter Optimization**
  A Python library for gradient-based hyperparameter optimization, implementing cutting-edge algorithms that leverage automatic differentiation to efficiently tune hyperparameters.
- **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

- **Fall 2025-2026:**
  - Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Spring 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
- **Fall 2024-2025:**
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- **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

- **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

- **DL:** PyTorch, Huggingface, Accelerate, Multi-GPU training: DDP/FSDP/SP/TP, W&B, TensorBoard
- **ML:** NumPy, SciPy, Pandas, NetworkX, Scikit-learn, LightGBM, CatBoost
- **OS:** macOS, Linux, Windows
- **Misc.:** Git, Bash, LaTeX
- **Soft Skills:** responsible, organized, critical thinker, flexible, communicative, team player, patient

LANGUAGES

- Russian (Native)
- English (Advanced)

INTERESTS

- Gym
- Guitar