Andrii Semenov

1005, Lausanne, Switzerland

Email Profile GitHub Website Scholar

Education

École polytechnique fédérale de Lausanne
MSc in Data Science Sep 2024 -

- School of Computer and Communication Sciences
- Machine Learning and Optimization Laboratory

Moscow Institute of Physics and Technology
BSc in Applied Mathematics and Physics Sep 2020 - Aug 2024

- Landau Phystech School of Physics and Research
- Chair of Problems of Physics and Astrophysics
- Affiliated with Yandex chair of Data Analysis
- Advisor: Aleksandr Beznosikov
- Thesis: "Contrastive Learning for Enhancement of Model Interpretability in Computer Vision"

Work Experience

Research Assistant | Machine Learning and Optimization Laboratory, EPFL Aug 2024 -

- Head: Professor Martin Jaggi

Visiting Researcher | Machine Learning Department, MBZUAI Feb 2025 -Apr 2025

- Head: Professor Martin Takáč

Research Student | MIPT-Yandex Fundamental Research Laboratory Jul 2023 - Oct 2024

- Machine Learning and Optimization
- Head: PhD Aleksandr Beznosikov

Research Student | Laboratory of Mathematical Methods of Optimization, MIPT Jul 2023 - Oct 2024

- Optimization
- Head : Professor Alexander Gasnikov

Deep Learning Engineer | Huawei-MIPT research group Nov 2023 - Oct 2024

- Deep Learning and Reinforcement Learning
- Head : Professor Roland Hildebrand

Research Student | Lab of Fundamental and Applied Research of Relativistic Objects Nov 2022 - Apr 2024

- Theoretical Physics, Astrophysics
- Head : DSc Elena Nokhrina

Research Physicist | P.N. Lebedev Physical Institute Nov 2022 - Jul 2023

- Theoretical Physics, Astrophysics

Skills

Stack	Python, PyTorch, TensorFlow, JAX, C++, C#, LaTeX, SQL, Git, Linux, macOS
Language	English – C1, Russian – native, Ukrainian – native
Hobbies	Swimming, Football

Research Interests

Large-Scale Optimization, Natural Language Processing, Federated Learning and applications of Stochastic Optimization in Deep Learning

Publications

Sign Operator for Coping with Heavy-Tailed Noise: High Probability Convergence Bounds with Extensions to Distributed Optimization and Comparison Oracle Feb 2025

Preprint

Nikita Kornilov, Philip Zmushko, Andrei Semenov, Alexander Gasnikov, Aleksandr Beznosikov

- arXiv
- PDF

Just a Simple Transformation is Enough for Data Protection in Vertical Federated Learning Dec 2024

Preprint

Andrei Semenov, Philip Zmushko, Alexander Pichugin, Aleksandr Beznosikov

- arXiv
- Code

Mixed Newton Method for Optimization in Complex Spaces Jul 2024

Preprint

Nikita Yudin, Roland Hildebrand, Sergey Bakhurin, Alexander Degtyarev, Anna Lisachenko, Ilya Kuruzov, Andrei Semenov, Mohammad Alkousa

- arXiv
- PDF

Clipping Improves Adam-Norm and AdaGrad-Norm when the Noise Is Heavy-Tailed Jun 2024

ICML 2025

Savelii Chezhegov, Yaroslav Klyukin, Andrei Semenov, Aleksandr Beznosikov, Alexander Gasnikov, Samuel Horváth, Martin Takáč, Eduard Gorbunov

- arXiv
- Code

Sparse Concept Bottleneck Models: Gumbel tricks in Contrastive Learning Feb 2024

Preprint

Andrei Semenov, Vladimir Ivanov, Aleksandr Beznosikov, Alexander Gasnikov

- arXiv
- Code

Bregman Proximal Method for Efficient Communications under Similarity Nov 2023

International Conference on Computational Optimization, 2024 (**Oral Presentation**)

Aleksandr Beznosikov, Darina Dvinskikh, Dmitry Bylinkin, Andrei Semenov, Alexander Gasnikov

- arXiv
- PDF
- ICOMP 2024

Honors and Awards

University

- **Autumn 2024:** 1st degree personal scholarship for contributions to the development of numerical optimization methods
- **Autumn 2024:** K. V. Rudakov scientific academic scholarship (**$2700** during one semester)
- **Spring 2024:** Participated in MIPT "Match of the Century" football tournament
- **Autumn 2023:** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Summer 2023:** Participated in the Terra Quantum AG Summer School. Studied Neural Networks and received an award for the best project in Parameter-Efficient Fine-Tuning
- **Spring 2023:** Participated in MIPT "Match of the Century" football tournament
- **Autumn 2022:** MIPT football tournament contestant. Currently team captain
- **Spring 2022:** Honorable Award in MIPT Swimming championship

- **Spring 2022:** Participated in MIPT "Match of the Century" football tournament
- **Spring 2022:** Organized students Olympiad in Physics
- **Winter 2021–2022:** Organized film screenings at the MIPT
- **Winter 2021:** Passed Landau Theoretical Minimum exam
- **Autumn 2021:** Third prize at the MIPT football tournament
- **2021 – 2023:** Abramov scholarship for 1-3 year bachelor students with the best grades at MIPT
- **2020:** Increased Scholarship for students with Olympiad awards

School

- **Autumn 2020:** Silver medal in GeCAA (International Olympiad in Astronomy and Astrophysics), was held online during the first semester at University because of pandemic risk
- **Winter 2019–2020:** Prize-Winner, ExPhO.
- **Autumn 2018:** Honorable Mention in IAO, Colombo, Sri-Lanka

Projects

Improved Megatron-LM | a codebase for large-scale training and inference — Feb 2025 –
Swiss AI Initiative & EPFL, Machine Learning and Optimization Laboratory — Project Link

- This repository is designed to help researchers create reproducible experiments at scale
- Allows training of up to 70B models
- Inspired by the NVIDIA codebase and its variant from Swiss AI

Learning@Scale | nanoGPT-like codebase for training models — Oct 2024 –
EPFL, Machine Learning and Optimization Laboratory — Project Link

- This repository is designed to help researchers create reproducible experiments
- Designed for the small-scale experiments ($\leq$ 8B models) in the DDP setting
- Inspired by the epfml/llm-baselines codebase and the nanoGPT benchmark

Llama-LoRA project | Natural Language Processing, Transformers — Jul 2023
Terra Quantum AG — Project Link

- Best project award at Terra Quantum Summer School in Neural Networks
- Studied a novel methods of Parameter-Efficient Tuning of LLMs
- Fine-tuned 13B and 7B models on a custom dataset containing my Telegram chats
- Pushed my models to HuggingFace hub. Where they got 10000+ downloads! HuggingFace Link

Talks

- 9 October 2024, MLO Group Meeting. Talk on the "Defense against Feature Reconstruction attacks" [slides]
- 26 March 2024, MIPT-Yandex Optimization Seminar. Talk on "Model Reconstruction Attacks" [video]
- 12 March 2024, MIPT-Yandex Optimization Seminar. Talk on "Concept Bottleneck Models" [video]

Teaching

Moscow Institute of Physics and Technology
Teaching Assistant — Jan 2024 -

- Spring 2025: Stochastic Analysis (remote mentor)
- Autumn 2024: Machine Learning. Part of the MSAI team, course repository
- Spring 2024: Reinforcement Learning. Owner of the course repository

Reviewing

- ICLR: 3 papers in 2024

Last updated on May 10, 2025