

ANDRII SEMENOV

1005, Lausanne, Switzerland

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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

Visiting Researcher | [Machine Learning Department, MBZUAI](#)

Feb 2025 -

- Head: Professor [Martin Takáč](#)

Research Student | [Machine Learning and Optimization Laboratory, EPFL](#)

Aug 2024 -

- Head: Professor [Martin Jaggi](#)

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](#)

Teaching Assistant | [Department of Mathematical Fundamentals of Control, MIPT](#)

Jan 2024 - Aug 2024

- [Reinforcement Learning course](#). Lecturer: [Yudin Nikita](#)

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](#)

Gradient Clipping Improves AdaGrad when the Noise Is Heavy-Tailed

Jun 2024

Preprint

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

Swiss AI Initiative & EPFL, Machine Learning and Optimization Laboratory

Feb 2025 –

[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

EPFL, Machine Learning and Optimization Laboratory

Oct 2024 –

[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

Terra Quantum AG

Jul 2023

[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