

# ANDRII SEMENOV

1005, Lausanne, Switzerland

[in Profile](#) [GitHub](#) [Website](#) [G Scholar](#)

## EDUCATION

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### 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

MSc in Computer Science and Informatics

Sep 2024 -

- Phystech School of Applied Mathematics and Informatics
- Department of Intelligent Systems

### 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

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### Deep Learning Engineer | Huawei-MIPT research group

Nov 2023 -

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

### Research Student | MIPT-Yandex Fundamental Research Laboratory

Jul 2023 -

- Machine Learning and Optimization
- Head: PhD Aleksandr Beznosikov

### Research Student | Laboratory of Mathematical Methods of Optimization, MIPT

Jul 2023 -

- Optimization
- Head : Professor Alexander Gasnikov

### 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

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**Stack** Python, C++, C#, L<sup>A</sup>T<sub>E</sub>X, PostgreSQL, MySQL, Git, Linux, macOS  
**Language** English – C1, Russian – native, Ukrainian – native  
**Hobbies** Swimming, Football

## RESEARCH INTERESTS

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Federated Learning, Natural Language Processing, Computer Vision and applications of Stochastic Optimization in Deep Learning

## PUBLICATIONS

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### 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

*Under review as a conference paper at NeurIPS 2024*

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

*Under review as a conference paper at NeurIPS 2024*

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, Andrei Semenov, Alexander Gasnikov

- [arXiv](#)
- [PDF](#)
- [ICOMP 2024](#)

## HONORS AND AWARDS

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### 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

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**PAUS** | Optimization, Machine Learning

Nov 2023

*MIPT, Laboratory of Mathematical Methods of Optimization*

[Project Link](#)

- Numerical simulations for [paper](#)
- Implemented a new distributed algorithm for convex-concave saddle-point problems in non-euclidean setup
- The paper was accepted to [ICOMP 2024](#) with an Oral Presentation

**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
- Tuned a 13B and 7B models on custom dataset containing my Telegram chats
- Pushed my models to HuggingFace hub. Where they got 10000+ downloads! [HuggingFace Link](#)

**Solar System Model in Python** | Python, Computational Physics

Nov 2020 – Dec 2020

*Moscow Institute of Physics and Technology*

[Project Link](#)

- We have developed a simple model approximating the Solar System and implemented it on Python

## TALKS

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- 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

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**Moscow Institute of Physics and Technology**

*Teaching Assistant*

Jan 2024 -

- Autumn 2024: Machine Learning. Part of the [MSAI](#) team, course [repository](#)
- Spring 2024: Reinforcement Learning. Owner of the course [repository](#)