

ANDRII SEMENOV

2k2, Likhachevsky Drive, Dolgoprudny, Russia

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

PERSONAL STATEMENT

Currently, I am a fourth-year student at the Landau School of Physics and Research at MIPT, working under supervision of PhD [Aleksandr Beznosikov](#) in [Yandex.Research-MIPT](#) team.

During my school years, I participated in three international Olympiads, in this case my longtime passion for Natural Sciences encourages me to study and do research.

By the beginning of the fourth academic year, we published my first paper in Optimization and continue to work monotonously on new problems. I am striving to uncover more astounding things around Machine Learning and Optimization.

EDUCATION

Moscow Institute of Physics and Technology

BSc in Applied Mathematics and Physics

Sep 2020 -

- [Landau Phystech School of Physics and Research](#)
- [Chair of Problems of Physics and Astrophysics](#)
- Affiliated with [Yandex chair of Data Analysis](#)
- Advisor: [Aleksandr Beznosikov](#)

WORK EXPERIENCE

Teaching assistant | Department of Mathematical Fundamentals of Control, MIPT

Jan 2024 -

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

Deep Learning Engineer | Huawei-MIPT research group

Nov 2023 -

- Deep Learning and Reinforcement Learning.
- Head : Professor [Roland Hildebrand](#).

Research Student | [Yandex.Research-MIPT Lab](#)

Jul 2023 -

- Machine Learning and Optimization.
- Head: PhD [Aleksandr Beznosikov](#).

Research Student | [Laboratory of Mathematical Methods of Optimization](#)

Jul 2023 -

- Optimization.
- Head : Professor [Alexander Gasnikov](#).

Research Student | [Laboratory of Fundamental and Applied Research of Relativistic Objects](#)

Nov 2022 -

- Theoretical Physics, Astrophysics.
- Head : D.Sc. [Elena Nokhrina](#).

Research Physicist | [P.N.Lebedev Physical Institute](#)

Nov 2022 - Jul 2023

- Theoretical Physics, Astrophysics.

SKILLS

Stack	Python, C++, C#, LaTeX, PostgreSQL, MySQL, Git, Linux, macOS
Language	English – C1, Russian – native, Ukrainian – native
Hobbies	Swimming, Football

RESEARCH INTERESTS

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

- In Laboratory of Mathematical Methods of Optimization I mostly cover research in field of distributed optimization, Heavy Tailed Noise and gradient clipping in NLP.
- In Yandex.Research I work on Contrastive Learning and interpretability increasing techniques, such as Concept Bottleneck model approach.
- As Deep Learning Engineer in joint MIPT-Huawei group we improve neural networks used in production paying more attention to the theoretical aspects.

HONORS AND AWARDS

University

- **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:** Bronze medal at IZhO, Almaty, Kazakhstan.
- **Autumn 2018:** Honorable Mention in IAO, Colombo, Sri-Lanka.

PUBLICATIONS

Sparse Concept Bottleneck Models: Gumbel tricks in Contrastive Learning

Feb 2024

Under review as a conference paper at ICML 2024

- [OpenReview](#).
- [Code](#).

Bregman Proximal Method for Efficient Communications under Similarity

Nov 2023

Under review as a conference paper at ICML 2024

[arXiv:2311.06953](#)

- Work has been done along with my advisor in Laboratory of Mathematical Methods of Optimization.
- [arXiv](#).
- [PDF](#).

PROJECTS

PAUS | Optimization, Machine Learning

Ongoing

MIPT, Laboratory of Mathematical Methods of Optimization

(Expected by Jan '24)

- Numerical simulations for [paper](#).
- Developed a new distributed algorithm for convex-concave saddle-point problems in non-euclidean setup.
- Derived the optimal parameters and stepsizes for the algorithms.
- I will be able to push it on my GitHub after the review process is completed.

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

- 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 -

- Reinforcement Learning. Owner of the course [repository](#).