# Aleksandr Beznosikov

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Scholar  arXiv

## EDUCATION

**Moscow Institute of Physics and Technology** — **Moscow, Russia**
*MSc in Applied Mathematics and Physics* — *Sep 2020 – Present*

- GPA – **3.93/4, 4.93/5, 9.4/10**

**Moscow Institute of Physics and Technology** — **Moscow, Russia**
*BSc in Applied Mathematics and Physics* — *Sep 2016 – Aug 2020*

- Thesis: "Distributed decentralized gradient-free methods for solving non-smooth stochastic convex optimization problems", Advisor: Alexander Gasnikov
- GPA – **3.99/4, 4.99/5, 9.35/10**

## WORK EXPERIENCE

**Yandex Research** — **Moscow, Russia**
*Research intern* — *Jul 2021 – Present*

**Laboratory of Advanced Combinatorics and Network Applications, MIPT** — **Moscow, Russia**
*Junior Researcher* — *Mar 2021 – Present*

**International Laboratory of SA and HDI, HSE** — **Moscow, Russia**
*Research assistant* — *Feb 2021 – Present*

**MADE: Big Data Academy Mail.Ru group** — **Moscow, Russia**
*Teaching assistant* — *Feb 2021 - Present*

**Moscow Institute of Physics and Technology** — **Moscow, Russia**
*Teaching assistant at the Department of Mathematical Fundamentals of Control* — *Sep 2017 – Present*

## RESEARCH INTERESTS

- Stochastic Optimization
- Distributed Optimization
- Machine Learning
- Federated Learning

## COMPUTER SKILLS

- Programming Language: **Python, C#, C++, C, SQL**
- LaTeX
- Operating Systems: **Microsoft Windows, Linux, Mac OSX**

## LANGUAGE

- **Russian:** [Mothertongue]
- **English:** [Upper Intermediate]

## INTERESTS

- **Basketball**: Candidate Master of Sports in Russia

## PUBLICATIONS

- A. Beznosikov, P. Richtárik, M. Diskin, M. Ryabinin, A. Gasnikov
  Distributed Methods with Compressed Communication for Solving Variational Inequalities, with Theoretical Guarantees
  October 2021, arxiv.org:2110.03313
- A. Beznosikov, G. Scutari, A. Rogozin, A. Gasnikov
  Distributed Saddle-Point Problems Under Similarity
  July 2021, **NeurIPS 2021**, poster at the main conference
- A. Sadiev, E. Borodich, A. Beznosikov, D. Dvinskikh, M. Takac, A. Gasnikov
  Decentralized and Personalized Federated Learning
  July 2021, **NeurIPS 2021**, spotlight at workshop on Optimization for Machine Learning
- A. Beznosikov, A. Rogozin, D. Kovalev, A. Gasnikov
  Near-Optimal Decentralized Algorithms for Saddle Point Problems over Time-Varying Networks
  July 2021, OPTIMA 2021 (LNCS series)
- I. Stepanov, A. Voronov, A. Beznosikov, A. Gasnikov
  One-Point Gradient-Free Methods for Composite Optimization with Applications to Distributed Optimization
  July 2021, arXiv:2107.05951
- A. Beznosikov, P. Dvurechensky, A. Koloskova, V. Samokhin, S. Stich, A. Gasnikov
  Decentralized Local Stochastic Extra-Gradient for Variational Inequalities
  June 2021, arXiv:2106.08315
- E. Borodich, A. Beznosikov, A. Sadiev, V. Sushko, N. Savelyev, M. Takac, A. Gasnikov
  Decentralized Personalized Federated Min-Max Problems
  June 2021, **NeurIPS 2021**, poster at workshop on New Frontiers in Federated Learning: Privacy, Fairness, Robustness, Personalization and Data Ownership
- E. Gladin, A. Sadiev, A. Gasnikov, P. Dvurechensky, A. Beznosikov, M. Alkousa
  Solving smooth min-min and min-max problems by mixed oracle algorithms
  March 2021, MOTOR 2021 (CCIS series)
- A. Beznosikov, V. Novitskii, A. Gasnikov
  One-Point Gradient-Free Methods for Smooth and Non-Smooth Saddle-Point Problems
  March 2021, MOTOR 2021 (LNCS series)
- A. Beznosikov, V. Samokhin, A. Gasnikov
  Distributed Saddle-Point Problems: Lower Bounds, Optimal and Robust Algorithms
  February 2021, Communication Efficient Distributed Optimization Workshop, poster
- A. Rogozin, A. Beznosikov, D. Dvinskikh, D. Kovalev, P. Dvurechensky, A. Gasnikov
  Decentralized Distributed Optimization for Saddle Point Problems
  February 2021, arXiv:2102.07758
- E. Gorbunov, A. Rogozin, A. Beznosikov, D. Dvinskikh, A. Gasnikov
  Recent theoretical advances in decentralized distributed convex optimization
  November 2020, High Dimensional Optimization and Probability Journal

- A. Sadiev, A. Beznosikov, P. Dvurechensky, A. Gasnikov
  Zeroth-Order Algorithms for Smooth Saddle-Point Problems
  September 2020, MOTOR 2021 (CCIS series)
- A. Bazarova, A. Beznosikov, A. Gasnikov
  Linearly Convergent Gradient-Free Methods for Minimization of Symmetric Parabolic Approximation
  September 2020, arXiv:2009.04906
- A. Beznosikov, A. Sadiev, A. Gasnikov
  Gradient-Free Methods for Saddle-Point Problem
  May 2020, MOTOR 2020 (CCIS series)
- A. Beznosikov, S. Horváth, P. Richtárik, M. Safaryan
  On Biased Compression for Distributed Learning
  February 2020, **NeurIPS 2020**, oral talk at workshop on Scalability, Privacy, and Security in Federated Learning
- A. Beznosikov, E. Gorbunov, A. Gasnikov
  Derivative-Free Method For Composite Optimization With Applications To Decentralized Distributed Optimization
  November 2019, IFAC World Congress 2020 (IFAC-PapersOnline)

## TALKS

- September 2021, International Conference Optimization and Applications (OPTIMA 2021), Petrovac, Montenegro (online) – 15 min oral talk
- July 2021 Modern Methods of Information Theory, Optimization and Control (summer school), Sochi, Russia – 1 hour lecture
- June 2021 All-Russian Optimization Seminar, Moscow, Russia – 45 min oral talk
- June 2021 Control, Information and Optimization Summer School, Moscow, Russia – 1,5 hour lecture
- June 2021 Moscow Conference on Combinatorics and Applications, Moscow, Russia (online) – 30 min oral talk
- April 2021, MADE: Big Data Academy Mail.Ru group, Moscow, Russia (online) – 3 hour lecture
- April 2021, Communication Efficient Distributed Optimization Workshop, (online) – poster session
- July 2020, Mathematical Optimization Theory and Operations Research (MOTOR 2020), Novosibirsk, Russia (online) – 15 min oral talk
- July 2020, 21st IFAC World Congress 2020, Berlin, Germany (online) – video and poster
- December 2019, Quasilinear Equations, Inverse Problems and Their Applications 2019, Moscow, Russia – 15 min oral talk
- November 2019, The 62th MIPT Conference – 15 min oral talk, **winner**
- November 2017, The 60th MIPT Conference, Moscow, Russia – 15 min oral talk, **winner**

## RESEARCH VISITS

- October – November 2021, MBZUAI, Abu Dhabi, United Arab Emirates (worked with Martin Takac)
- July – August 2021, Sirius University of Science and Technology, Sochi, Russia
- August – August 2020, Sirius University of Science and Technology, Sochi, Russia
- January – February 2020, Visual Computing Center, KAUST, Thuwal, Saudi Arabia (worked with Peter Richtárik)

## SCHOLARSHIPS, HONORS AND AWARDS

**University** *2016 - Present*

- **Fall 2021-2022** 1st degree personal scholarship for contributions to the development of numerical optimization methods
- **Fall 2021-2022** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Spring 2020-2021** 1st degree personal scholarship for contributions to the development of numerical optimization methods
- **Spring 2020-2021** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Fall 2020-2021** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **2020** Gazprom Bank personal scholarship
- **2020** Moscow region government scholarship
- **2020** Personal merit scholarship at MIPT
- **Spring 2019-2020** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Fall 2019-2020** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Spring 2018-2019** Increased State Academic Scholarship for 4 year bachelor and master students at MIPT
- **Fall 2018-2019** Author of problems and organizer of the student olympiad in discrete mathematics
- **2017**: First Prize at MIPT's Team Mathematical Tournament
- **2017-2019**: Abramov scholarship for 1-3 year bachelor students with the best grades at MIPT

**School** *2016 and earlier*

- **2015**: Silver medal in IEPhO (International Experimental Physics Olympiad)
- **2014-2015**: Russian President's Scholarship, for high school student
- **2015**: Prize-Winner, All-Russian School Physics Olympiad, Final Round
- **2014**: Prize-Winner, All-Russian School Physics Olympiad, Final Round
- **2014-2015**: Russian President's Scholarship,for high school student
- **2015-2016**: Winner, All-Russian School Programming Olympiad, Region Round
- **2014-2016**: Winner, All-Russian School Physics Olympiad, Region Round
- **2014-2016**: Winner, All-Russian School Maths Olympiad, Region Round

## TEACHING

**MADE: Big Data Academy Mail.Ru group** **Moscow, Russia**
*Teaching assistant* *Feb 2021 - Present*

- Spring 2021: Optimization in Machine Learning

**Moscow Institute of Physics and Technology** **Moscow, Russia**
*Teaching assistant at the Department of Mathematical Fundamentals of Control* *Sep 2017 - Present*

- Fall 2021: Probability theory
- Spring 2021: Stochastic process
- Fall 2020: Probability theory
- Fall 2020: Discrete analysis
- Spring 2020: Stochastic process
- Fall 2019: Probability theory
- Fall 2019: Discrete analysis
- Fall 2018: Discrete analysis
- Fall 2018: Databases
- Fall 2017: Databases

**Summer school in Physics and Mathematics Lyceum** **Syktyvkar, Russia**
*Director, Head of teaching staff* *Aug 2018, Aug 2019*

- Summer school for gifted children from provincial towns and villages

## REVIEWING

- Automatica: 1 paper in 2021.
- IEEE Transactions on Information Theory: 1 paper in 2021.
- AISTATS 2022: 3 papers.