Abdurakhmon Sadiev

Personal Data

Place and Date of Birth:	Moscow, Russia | November 2, 1998
Phone:	+966541757258 (Saudi Arabia)
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Research Interests

Stochastic Optimization, Variational Inequalities, Federated Learning

Education

Sept. 2022 - Present	PhD in Computer Science **King Abdullah University of Science and Technology**, Thuwal, Saudi Arabia Advisor: Peter Richtárik
Sept. 2020 - July 2022	MS in Applied Mathematics and Physics **Moscow Institute of Physics and Technology**, Moscow, Russia Advisor: Alexander Gasnikov
Sept. 2016 - July 2020	BS in Applied Mathematics and Physics **Moscow Institute of Physics and Technology**, Moscow, Russia Advisor: Alexander Gasnikov

Work Experience

July 2021 - July 2022	Junior Researcher at the Laboratory of Advanced Combinatorics and Network Applications, *Moscow Institute of Physics and Technology*, Russia
September 2020 - July 2022	Teaching assistant at the Department of Advanced Mathematics; *Moscow Institute of Physics and Technology*, Russia Duties: teach **Functional Analysis**, **Calculus**;
September 2020 - July 2022	Teaching assistant at the Department of Mathematical Fundamentals of Control *Moscow Institute of Physics and Technology*, Russia Duties: teach **Methods of Optimal Control**.

Publications and Preprints

13. **A. Sadiev**, M. Danilova, E Gorbunov, S Horváth, G. Gidel, P. Dvurechensky, A. Gasnikov and P. Richtárik
High-Probability Bounds for Stochastic Optimization and Variational Inequalities: the Case of Unbounded Variance, arXiv preprint: arXiv:2302.00999;
Status: Accepted to ICML 2023

12. M. Makarenko, E. Gasanov, R. Islamov, **A. Sadiev** and P. Richtárik
Adaptive Compression for Communication-Efficient Distributed Training, arXiv preprint: arXiv:2211.00188;
Status: Under review

11. **A. Sadiev**, D. Kovalev and P. Richtárik
Communication Acceleration of Local Gradient Methods via an Accelerated Primal-Dual Algorithm with Inexact Prox, arXiv:2207.03957
Status: Accepted to NeurIPS 2022

10. **A. Sadiev**, G. Malinovsky, E Gorbunov, I. Sokolov, A. Khaled, K. Burlachenko and P. Richtárik

Federated Optimization Algorithms with Random Reshuffling and Gradient Compression, arXiv preprint: arXiv:2206.07021;
Status: Under review

9. **A. Sadiev**, A. Beznosikov, AJ Almansoori, D Kamzolov, R. Tappenden and M. Takác
Stochastic gradient methods with preconditioned updates, arXiv preprint: arXiv:2206.00285;
Status: Under review

8. M. Alkousa, A. Gasnikov, P. Dvurechensky, **A. Sadiev** and L. Razouk
An Approach for Non-convex Uniformly Concave Structured Saddle Point Problem, arXiv preprint arXiv:2202.06376;
Status: Accepted to CRM

7. D. Kovalev, A. Beznosikov, **A. Sadiev**, M. Persiianov, P. Richtárik and A. Gasnikov
Optimal Algorithms for Decentralized Stochastic Variational Inequalities, arXiv preprint: arXiv:2202.02771
Status: Accepted to NeurIPS 2022

6. Z. Shi, **A. Sadiev**, N. Loizou, P. Richtárik and M. Takác
AI-SARAH: Adaptive and Implicit Stochastic Recursive Gradient Methods, arXiv preprint: arXiv:2102.09700
Status: Accepted to TMLR

5. **A. Sadiev**, E. Borodich , A. Beznosikov, D. Dvinskikh, S. Chezhegov, R. Tappenden, M. Takác and A. Gasnikov
Decentralized and Personalized Federated Learning, arXiv preprint arXiv:2107.07190;
NeurIPS 2021, spotlight at workshop on Optimization for Machine Learning
Status: Accepted to EURO Journal on Computational Optimization

4. E. Borodich, A. Beznosikov, **A. Sadiev**, V. Sushko, N. Savelyev, M. Takác and A. Gasnikov
Decentralized Personalized Federated Min-Max Problems, arXiv preprint arXiv:2106.07289;
NeurIPS 2021, poster at workshop on New Frontiers in Federated Learning: Privacy, Fairness, Robustness, Personalization and Data Ownership
Status: Under review.

3. E. Gladin, **A. Sadiev**, A. Gasnikov, P. Dvurechensky, A. Beznosikov and M. Alkousa
Solving smooth min-min and min-max problems by mixed oracle algorithms, arXiv preprint: arXiv:2103.00434
Status: Accepted to MOTOR-2021, published in Communications in Computer and Information Science (CCIS) series.

2. **A. Sadiev**, A. Beznosikov, P. Dvurechensky and A. Gasnikov
Zeroth-Order Algorithms for Smooth Saddle-Point Problems, arXiv preprint: arXiv:2009.09908
Status: Accepted to MOTOR-2021, published in Communications in Computer and Information Science (CCIS) series.

1. A. Beznosikov, **A. Sadiev** and A. Gasnikov
Gradient-Free Methods for Saddle-Point Problem, arXiv preprint: arXiv:2005.05913
Status: Accepted to MOTOR-2020, published in Communications in Computer and Information Science (CCIS) series.

Research Visiting

- February – July 2022; KAUST, Thuwal, Kingdom of Saudi Arabia (worked with Peter Richtárik)
- October – November 2021; MBZUAI, Abu Dhabi, United Arab Emirates (worked with Martin Takác)

Conference Presentations

- **July 5-10, 2021**: International conference on "Mathematical Optimization Theory and Operations Research" MOTOR-2021, Irkutsk, Russia.
- **July 6-11, 2020**: International conference on "Mathematical Optimization Theory and Operations Research" MOTOR-2020, Novosibirsk, Russia.

Awards & Scholarships

- **September 2022 - September 2025**: KAUST Discovery Doctoral Fellowship (KDDF), KAUST.
- **September 2022 - September 2025**: Dean's award, KAUST.
- **September 2021 - December 2021**; Increased State Academic Scholarship for 4 year bachelor and master students at MIPT.
- **September 2021 - December 2021**; 2nd degree prof. Andrei Raigorodskii personal scholarship for contributions to the development of numerical optimization methods.
- **February - June 2021**; 3rd degree prof. Andrei Raigorodskii personal scholarship for contributions to the development of numerical optimization methods.
- **September - December 2020**; Increased State Academic Scholarship for 4 year bachelor and master students at MIPT.
- **September - December 2018**; Abramov scholarship for 1-3 year bachelor students with the best grades at MIPT.
- **February - June 2018**; Abramov scholarship for 1-3 year bachelor students with the best grades at MIPT.

Summer Schools

- **July-August 2021**: Summer School on "Modern Methods of Information Theory, Optimization and Control Theory" (*Sirius University of Science and Technology*, Sochi, Russia)
- **June 2021**: Summer School on "Control, Information and Optimization"
- **August 2020**: Summer School on "Control, Information and Optimization" (*Sirius University of Science and Technology*, Sochi, Russia)
- **August 2020**: Summer School on "Modern Methods of Information Theory, Optimization and Control Theory" (*Sirius University of Science and Technology*, Sochi, Russia)

Computer Skills

Operating Systems:	Mac OSX, Microsoft Windows, Linux
Programming Languages:	Python, LaTeX, C, C++

Languages

Russian:	Native speaker
English:	Advanced

Other Interests

Chess: 5 years in chess school in Moscow, Russia. Now I am playing chess online. Theater: 4 years in school theater.