

Dmitry Kovalev

PERSONAL DATA

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EDUCATION

2014-2018 BS in Applied Mathematics and Physics
Moscow Institute of Physics and Technology, Dolgoprudny, Russia
Advisor: [Alexander Gasnikov](#)
2018-2019 MS in Computer Science
King Abdullah University of Science and Technology, Thuwal, Saudi Arabia
Advisor: [Peter Richtárik](#)
2018-2021 MS in Applied Mathematics and Physics
Moscow Institute of Physics and Technology, Dolgoprudny, Russia
Advisor: [Alexander Gasnikov](#)
2019-Now PhD in Computer Science
King Abdullah University of Science and Technology, Thuwal, Saudi Arabia
Advisor: [Peter Richtárik](#)

RESEARCH INTERESTS

Optimization Algorithms
Distributed Optimization
Machine Learning

SKILLS

PROGRAMMING C/C++, Python; PAST EXPERIENCE: Go, C#, VB.NET, SQL, Julia
COMPUTER macOS, LaTeX, Git
MATHEMATICS Calculus, Linear Algebra, Probability and Statistics, Convex Analysis

LANGUAGES

ENGLISH Advanced Knowledge
RUSSIAN Mothertongue

HONORS AND AWARDS

1. **CEMSE Student Research Excellence Award**, King Abdullah University of Science and Technology, 2021
2. **Best Student Paper Award at FL-ICML 2021 Workshop**
3. **Ilya Segalovich Scientific Prize for Young Researchers 2021**, Yandex (highly selective: only 4 winners from Russia, Belarus, Kazakhstan)
4. **Annual PhD progress marked as Outstanding**, King Abdullah University of Science and Technology, 2019-2021
5. **Ilya Segalovich Scientific Prize for Young Researchers 2020**, Yandex (highly selective: only 9 winners from Russia, Belarus, Kazakhstan)
6. **Dean's Award**, given to top students accepted to King Abdullah University of Science and Technology, 2018
7. **Abramov's Fund Scholarship for Excellence in Study**, Moscow Institute of Physics and

Technology, 2015-2017

8. **Asian Physics Olympiad (APhO) 2014, Honourable Mention**, Singapore (participated as a member of Russian national team)
9. **Russian President's Scholarship for High School Students**, given for prize-winning at final round of All-Russian School Olympiads, 2012-2014
10. **Moscow Governor's Scholarship for High School Students**, given for prize-winning at region and final rounds of All-Russian School Olympiads, 2012-2014
11. **All-Russian School Physics Olympiad, Final Round Prize-Winner**, Saint-Petersburg, 2014
12. **All-Russian School Programming Olympiad, Region Round Winner**, Moscow, 2014
13. **All-Russian School Math Olympiad, Region Round Winner**, Moscow, 2014
14. **All-Russian School Physics Olympiad, Final Round Winner**, Vladivostok, 2013
15. **All-Russian School Physics Olympiad, Final Round Prize-Winner**, Saransk, 2012

PUBLICATIONS

1. **Near-Optimal Decentralized Algorithms for Saddle Point Problems over Time-Varying Networks** (Aleksandr Beznosikov, Alexander Rogozin, Dmitry Kovalev, Alexander Gasnikov), *OPTIMA 2021*
2. **Lower Bounds and Optimal Algorithms for Smooth and Strongly Convex Decentralized Optimization Over Time-Varying Networks** (Dmitry Kovalev, Elnur Gasanov, Peter Richtarik, Alexander Gasnikov), *NeurIPS 2021*
3. **An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints** (Adil Salim, Laurent Condat, Dmitry Kovalev, Peter Richtarik), *AISTATS 2022*
4. **ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks** (Dmitry Kovalev, Egor Shulgin, Peter Richtarik, Alexander Rogozin, Alexander Gasnikov), *ICML 2021*
5. **IntSGD: Floatless Compression of Stochastic Gradients** (Konstantin Mishchenko, Bokun Wang, Dmitry Kovalev, Peter Richtarik), *ICLR 2022*
6. **A Linearly Convergent Algorithm for Decentralized Optimization: Sending Less Bits for Free!** (Dmitry Kovalev, Anastasia Koloskova, Martin Jaggi, Peter Richtarik, Sebastian U. Stich), *AISTATS 2021*
7. **Linearly Converging Error Compensated SGD** (Eduard Gorbunov, Dmitry Kovalev, Dmitry Makarenko, Peter Richtarik), *NeurIPS 2020*
8. **Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization** (Dmitry Kovalev, Adil Salim, Peter Richtarik), *NeurIPS 2020*
9. **From Local SGD to Local Fixed Point Methods for Federated Learning** (Grigory Malinovsky, Dmitry Kovalev, Elnur Gasanov, Laurent Condat, Peter Richtarik), *ICML 2020*
10. **Acceleration for Compressed Gradient Descent in Distributed and Federated Optimization** (Zhize Li, Dmitry Kovalev, Xun Qian, Peter Richtarik), *ICML 2020*
11. **Variance Reduced Coordinate Descent with Acceleration: New Method With a Surprising Application to Finite-Sum Problems** (Filip Hanzely, Dmitry Kovalev, Peter Richtarik), *ICML 2020*
12. **Stochastic Newton and Cubic Newton Methods with Simple Local Linear-Quadratic Rates** (Dmitry Kovalev, Konstantin Mishchenko, Peter Richtarik), *NeurIPS 2019 Workshop*
13. **Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates** (Adil Salim, Dmitry Kovalev, Peter Richtarik), *NeurIPS 2019*

14. **Revisiting Stochastic Extragradient** (Konstantin Mishchenko, Dmitry Kovalev, Egor Shulgin, Peter Richtarik, Yura Malitsky), *AISTATS* 2020
15. **RSN: Randomized Subspace Newton** (Robert M. Gower, Dmitry Kovalev, Felix Lieder, Peter Richtarik), *NeurIPS* 2019
16. **Don't Jump Through Hoops and Remove Those Loops: SVRG and Katyusha are Better Without the Outer Loop** (Dmitry Kovalev, Samuel Horvath, Peter Richtarik), *ALT* 2020
17. **A hypothesis about the rate of global convergence for optimal methods (Newton's type) in smooth convex optimization** (Alexander Gasnikov, Dmitry Kovalev), *Computer Research and Modeling*
18. **Stochastic Spectral and Conjugate Descent Methods** (Dmitry Kovalev, Eduard Gorbunov, Elnur Gasanov, Peter Richtarik), *NeurIPS* 2018

PREPRINTS

1. **On Scaled Methods for Saddle Point Problems** (Aleksandr Beznosikov, Aibek Alanov, Dmitry Kovalev, Martin Takac, Alexander Gasnikov), *arXiv preprint* (June 2022)
2. **Decentralized Saddle-Point Problems with Different Constants of Strong Convexity and Strong Concavity** (Dmitriy Metev, Alexander Rogozin, Alexander Gasnikov, Dmitry Kovalev), *arXiv preprint* (May 2022)
3. **Decentralized Computation of Wasserstein Barycenter over Time-Varying Networks** (Olga Yufereva, Michael Persiianov, Pavel Dvurechensky, Alexander Gasnikov, Dmitry Kovalev), *arXiv preprint* (May 2022)
4. **Optimal Gradient Sliding and its Application to Distributed Optimization Under Similarity** (Dmitry Kovalev, Aleksandr Beznosikov, Ekaterina Borodich, Alexander Gasnikov, Gesualdo Scutari), *arXiv preprint* (May 2022)
5. **The First Optimal Acceleration of High-Order Methods in Smooth Convex Optimization** (Dmitry Kovalev, Alexander Gasnikov), *arXiv preprint* (May 2022)
6. **The First Optimal Algorithm for Smooth and Strongly-Convex-Strongly-Concave Minimax Optimization** (Dmitry Kovalev, Alexander Gasnikov), *arXiv preprint* (May 2022)
7. **Optimal Algorithms for Decentralized Stochastic Variational Inequalities** (Dmitry Kovalev, Aleksandr Beznosikov, Abdurakhmon Sadiev, Michael Persiianov, Peter Richtarik, Alexander Gasnikov), *arXiv preprint* (February 2022)
8. **Accelerated Primal-Dual Gradient Method for Smooth and Convex-Concave Saddle-Point Problems with Bilinear Coupling** (Dmitry Kovalev, Alexander Gasnikov, Peter Richtarik), *arXiv preprint* (December 2021)
9. **Decentralized Distributed Optimization for Saddle Point Problems** (Alexander Rogozin, Alexander Beznosikov, Darina Dvinskikh, Dmitry Kovalev, Pavel Dvurechensky, Alexander Gasnikov), *arXiv preprint* (February 2021)
10. **Towards Accelerated Rates for Distributed Optimization over Time-varying Networks** (Alexander Rogozin, Vladislav Lukoshkin, Alexander Gasnikov, Dmitry Kovalev, Egor Shulgin), *arXiv preprint* (September 2020)
11. **Fast Linear Convergence of Randomized BFGS** (Dmitry Kovalev, Robert M. Gower, Peter Richtarik, Alexander Rogozin), *arXiv preprint* (February 2020)
12. **Distributed Fixed Point Methods with Compressed Iterates** (Selim Chraibi, Ahmed Khaled, Dmitry Kovalev, Peter Richtarik, Adil Salim, Martin Takac), *arXiv preprint* (December 2019)

13. Accelerated methods for composite non-bilinear saddle point problem (Mohammad Alkousa, Darina Dvinskikh, Fedor Stonyakin, Alexander Gasnikov, Dmitry Kovalev), *arXiv preprint* (December 2019)
14. Stochastic Distributed Learning with Gradient Quantization and Variance Reduction (Samuel Horvath, Dmitry Kovalev, Konstantin Mishchenko, Peter Richtarik, Sebastian U. Stich), *arXiv preprint* (April 2019)

CONFERENCE POSTERS AND TALKS

1. Talk: Lower Bounds and Optimal Algorithms for Smooth and Strongly Convex Decentralized Optimization Over Time-Varying Networks, *Rising Stars in AI Symposium 2022*, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (March 2022)
2. Talk/Poster: Lower Bounds and Optimal Algorithms for Smooth and Strongly Convex Decentralized Optimization Over Time-Varying Networks, *NeurIPS 2021*, Online (December 2021)
3. Poster: ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks, *Conference «Optimization Without Borders»*, Sirius University, Sochi, Russia (July 2021)
4. Talk/Poster: Lower Bounds and Optimal Algorithms for Smooth and Strongly Convex Decentralized Optimization Over Time-Varying Networks, *International Workshop on Federated Learning for User Privacy and Data Confidentiality in Conjunction with ICML 2021*, Online (July 2021)
5. Talk/Poster: ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks, *ICML 2021*, Online (July 2021)
6. Talk/Poster: A Linearly Convergent Algorithm for Decentralized Optimization: Sending Less Bits for Free!, *AISTATS 2021*, Online (April 2021)
7. Poster: Linearly Converging Error Compensated SGD, *NeurIPS 2020*, Online (December 2020)
8. Talk/Poster: Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization, *NeurIPS 2020*, Online (December 2020)
9. Talk: Variance Reduced Coordinate Descent with Acceleration: New Method With a Surprising Application to Finite-Sum Problems, *ICML 2020*, Online (July 2020)
10. Poster: RSN: Randomized Subspace Newton, *NeurIPS 2019*, Vancouver, Canada (December 2019)
11. Poster: Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates, *NeurIPS 2019*, Vancouver, Canada (December 2019)
12. Talk: Revisiting Stochastic Extragradient Method, *International Conference on Continuous Optimization 2019*, Technical University, Berlin, Germany (August 2019)
13. Poster: Stochastic Distributed Learning with Gradient Quantization and Variance Reduction, *Data Science Summer School 2019*, Ecole Polytechnique, Paris, France (June 2019)
14. Poster: Stochastic Distributed Learning with Gradient Quantization and Variance Reduction, *Traditional School (Control, Information and Optimization)*, Higher School of Economics Study Center, Voronovo, Russia (June 2019)
15. Talk: Stochastic Spectral Descent Methods, *Weekly Seminar «Automatic control and Optimization Theory»*, Institute for Control Problems, Moscow, Russia (March 2019)

16. **Talk: Stochastic Distributed Learning with Gradient Quantization and Variance Reduction**, *Seminar «Modern Optimization Methods»*, Moscow Institute of Physics and Technology, Moscow, Russia (March 2019)
17. **Poster: Stochastic Spectral Descent Methods**, *NeurIPS 2018*, Montreal, Canada (December 2018)
18. **Poster: Stochastic Spectral Descent Methods**, *Optimization and Big Data Workshop*, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (June 2018)
19. **Poster: Stochastic Spectral Descent Methods**, *Traditional School (Control, Information and Optimization)*, Higher School of Economics Study Center, Voronovo, Russia (February 2018)

TEACHING EXPERIENCE

1. **Mentor for a Research Project with MIPT student Ekaterina Borodich (online)**, Moscow Institute of Physics and Technology, Moscow, Russia (March 2022)
2. **Mentor for 2 Research Projects with KAUST Students Grigory Malinovsky and Abdurakhmon Sadiev**, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (March 2022)
3. **Project Mentor at «Modern Information, Optimization and Control Methods» Student Educational Program**, Sirius University, Sochi, Russia (July-August 2021)
4. **Mentor for a Research Project with Student Grigory Malinovsky (done during his internship at KAUST, resulted in ICML 2020 paper «From Local SGD to Local Fixed Point Methods for Federated Learning»)**, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (January 2020)

Last Updated on June 29, 2022