Dmitry Kovalev

Personal Data

Email	dakovalev1@gmail.com
Website	www.dmitry-kovalev.com
Phone	+7 905 719 06 98
Google Scholar	https://scholar.google.com/citations?user=qHFA5z4AAAAJ

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 Sudents**, given for prize-winning at final round of All-Russian School Olympiads, 2012-2014
10. **Moscow Governor's Scholarship for High School Sudents**, 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. **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*
2. **An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints** (Adil Salim, Laurent Condat, Dmitry Kovalev, Peter Richtarik), *AISTATS 2022*
3. **ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks** (Dmitry Kovalev, Egor Shulgin, Peter Richtarik, Alexander Rogozin, Alexander Gasnikov), *ICML 2021*
4. **IntSGD: Floatless Compression of Stochastic Gradients** (Konstantin Mishchenko, Bokun Wang, Dmitry Kovalev, Peter Richtarik), *ICLR 2022*
5. **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*
6. **Linearly Converging Error Compensated SGD** (Eduard Gorbunov, Dmitry Kovalev, Dmitry Makarenko, Peter Richtarik), *NeurIPS 2020*
7. **Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization** (Dmitry Kovalev, Adil Salim, Peter Richtarik), *NeurIPS 2020*
8. **From Local SGD to Local Fixed Point Methods for Federated Learning** (Grigory Malinovsky, Dmitry Kovalev, Elnur Gasanov, Laurent Condat, Peter Richtarik), *ICML 2020*
9. **Acceleration for Compressed Gradient Descent in Distributed and Federated Optimization** (Zhize Li, Dmitry Kovalev, Xun Qian, Peter Richtarik), *ICML 2020*
10. **Variance Reduced Coordinate Descent with Acceleration: New Method With a Surprising Application to Finite-Sum Problems** (Filip Hanzely, Dmitry Kovalev, Peter Richtarik), *ICML 2020*
11. **Stochastic Newton and Cubic Newton Methods with Simple Local Linear-Quadratic Rates** (Dmitry Kovalev, Konstantin Mishchenko, Peter Richtarik), *NeurIPS 2019 Workshop*
12. **Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates** (Adil Salim, Dmitry Kovalev, Peter Richtarik), *NeurIPS 2019*
13. **Revisiting Stochastic Extragradient** (Konstantin Mishchenko, Dmitry Kovalev, Egor Shulgin, Peter Richtarik, Yura Malitsky), *AISTATS 2020*

14. **RSN: Randomized Subspace Newton** (Robert M. Gower, Dmitry Kovalev, Felix Lieder, Peter Richtarik), *NeurIPS 2019*
15. **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*
16. **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*
17. **Stochastic Spectral and Conjugate Descent Methods** (Dmitry Kovalev, Eduard Gorbunov, Elnur Gasanov, Peter Richtarik), *NeurIPS 2018*

Preprints

1. **Optimal Algorithms for Decentralized Stochastic Variational Inequalities** (Dmitry Kovalev, Aleksandr Beznosikov, Abdurakhmon Sadiev, Michael Persiianov, Peter Richtarik, Alexander Gasnikov), *arXiv preprint (February 2022)*
2. **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)*
3. **Near-Optimal Decentralized Algorithms for Saddle Point Problems over Time-Varying Networks** (Aleksandr Beznosikov, Alexander Rogozin, Dmitry Kovalev, Alexander Gasnikov), *arXiv preprint (July 2021)*
4. **Decentralized Distributed Optimization for Saddle Point Problems** (Alexander Rogozin, Alexander Beznosikov, Darina Dvinskikh, Dmitry Kovalev, Pavel Dvurechensky, Alexander Gasnikov), *arXiv preprint (February 2021)*
5. **Towards Accelerated Rates for Distributed Optimization over Time-varying Networks** (Alexander Rogozin, Vladislav Lukoshkin, Alexander Gasnikov, Dmitry Kovalev, Egor Shulgin), *arXiv preprint (September 2020)*
6. **Fast Linear Convergence of Randomized BFGS** (Dmitry Kovalev, Robert M. Gower, Peter Richtarik, Alexander Rogozin), *arXiv preprint (February 2020)*
7. **Distributed Fixed Point Methods with Compressed Iterates** (Selim Chraibi, Ahmed Khaled, Dmitry Kovalev, Peter Richtarik, Adil Salim, Martin Takac), *arXiv preprint (December 2019)*
8. **Accelerated methods for composite non-bilinear saddle point problem** (Mohammad Alkousa, Darina Dvinskikh, Fedor Stonyakin, Alexander Gasnikov, Dmitry Kovalev), *arXiv preprint (December 2019)*
9. **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. **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)

4. **Talk/Poster: ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks**, *ICML 2021*, Online (July 2021)
5. **Talk/Poster: A Linearly Convergent Algorithm for Decentralized Optimization: Sending Less Bits for Free!**, *AISTATS 2021*, Online (April 2021)
6. **Poster: Linearly Converging Error Compensated SGD**, *NeurIPS 2020*, Online (December 2020)
7. **Talk/Poster: Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization**, *NeurIPS 2020*, Online (December 2020)
8. **Talk: Variance Reduced Coordinate Descent with Acceleration: New Method With a Surprising Application to Finite-Sum Problems**, *ICML 2020*, Online (July 2020)
9. **Poster: RSN: Randomized Subspace Newton**, *NeurIPS 2019*, Vancouver, Canada (December 2019)
10. **Poster: Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates**, *NeurIPS 2019*, Vancouver, Canada (December 2019)
11. **Talk: Revisiting Stochastic Extragradient Method**, *International Conference on Continuous Optimization 2019*, Technical University, Berlin, Germany (August 2019)
12. **Poster: Stochastic Distributed Learning with Gradient Quantization and Variance Reduction**, *Data Science Summer School 2019*, Ecole Polytechnique, Paris, France (June 2019)
13. **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)
14. **Talk: Stochastic Spectral Descent Methods**, *Weekly Seminar «Automatic control and Optimization Theory»*, Institute for Control Problems, Moscow, Russia (March 2019)
15. **Talk: Stochastic Distributed Learning with Gradient Quantization and Variance Reduction**, *Seminar «Modern Optimization Methods»*, Moscow Institute of Physics and Technology, Moscow, Russia (March 2019)
16. **Poster: Stochastic Spectral Descent Methods**, *NeurIPS 2018*, Montreal, Canada (December 2018)
17. **Poster: Stochastic Spectral Descent Methods**, *Optimization and Big Data Workshop*, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (June 2018)
18. **Poster: Stochastic Spectral Descent Methods**, *Traditional School (Control, Information and Optimization)*, Higher School of Economics Study Center, Voronovo, Russia (February 2018)

Last Updated on March 23, 2022