

# Dmitry Kovalev

2225-WS19, Building 1, King Abdullah University of Science and Technology, Thuwal, 23955, Saudi Arabia

☎ +7 905 719 06 98 | ✉ dakovalev1@gmail.com | 🌐 dmitry-kovalev.com | 📱 dakovalev1

## Education

### King Abdullah University of Science and Technology

PHD IN COMPUTER SCIENCE

Thuwal, Saudi Arabia

Jan. 2020 - PRESENT

### Moscow Institute of Physics and Technology

MS IN APPLIED MATHEMATICS AND PHYSICS

Moscow, Russia

Sep. 2018 - Jun. 2021

### King Abdullah University of Science and Technology

MS IN COMPUTER SCIENCE

Thuwal, Saudi Arabia

Sep. 2018 - Dec. 2019

### Moscow Institute of Physics and Technology

BS IN APPLIED MATHEMATICS AND PHYSICS

Moscow, Russia

Sep. 2014 - Jun. 2018

## Skills

**Programming** C/C++, Python; **Past Experience:** Go, C#, VB.NET

**Mathematics** Calculus, Linear Algebra, Probability and Statistics

## Honors & Awards

2021	<b>CEMSE Research Excellence Award</b> , King Abdullah University of Science and Technology	Saudi Arabia
2021	<b>Best Student Paper Award</b> , FL-ICML 2021 Workshop	Online
2021	<b>Yandex Ilya Segalovich Scientific Prize</b> , for young researchers	Moscow, Russia
2020	<b>Yandex Ilya Segalovich Scientific Prize</b> , for young researchers	Moscow, Russia
2015-2017	<b>Abramov's Fund Scholarship</b> , for top students of Moscow Institute of Physics and Technology	Moscow, Russia
2014	<b>Honourable Mention</b> , APHO (Asian Physics Olympiad)	Singapore
2014	<b>Prize-Winner</b> , All-Russian School Physics Olympiad, Final Round	Saint Petersburg, Russia
2014	<b>Winner</b> , All-Russian School Programming Olympiad, Region Round	Moscow, Russia
2014	<b>Winner</b> , All-Russian School Math Olympiad, Region Round	Moscow, Russia
2012-2014	<b>Russian President's Scholarship</b> , for high school students	Russia
2012-2014	<b>Moscow Governor's Scholarship</b> , for high school students	Moscow, Russia
2013	<b>Winner</b> , All-Russian School Physics Olympiad, Final Round	Vladivostok, Russia
2012	<b>Prize-Winner</b> , All-Russian School Physics Olympiad, Final Round	Saransk, Russia

## Papers

### Optimal Algorithms for Decentralized Stochastic Variational Inequalities

DMITRY KOVALEV, ALEKSANDR BEZNOSIKOV, ABDURAKHMOM SADIEV, MICHAEL PERSHIANOV, PETER RICHTÁRIK, ALEXANDER GASNIKOV

arXiv 2022

06 Feb 2022

### Accelerated Primal-Dual Gradient Method for Smooth and Convex-Concave Saddle-Point Problems with Bilinear Coupling

DMITRY KOVALEV, ALEXANDER GASNIKOV, PETER RICHTÁRIK

arXiv 2021

30 Dec 2021

## Near-Optimal Decentralized Algorithms for Saddle Point Problems over Time-Varying Networks

ALEKSANDR BEZNOSIKOV, ALEXANDER ROGOZIN, DMITRY KOVALEV, ALEXANDER GASNIKOV

[arXiv 2021](#)

13 Jul 2021

## Lower Bounds and Optimal Algorithms for Smooth and Strongly Convex Decentralized Optimization Over Time-Varying Networks

DMITRY KOVALEV, ELNUR GASANOV, PETER RICHTÁRIK, ALEXANDER GASNIKOV

[NeurIPS 2021](#)

08 Jun 2021

## An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints

ADIL SALIM, LAURENT CONDAT, DMITRY KOVALEV, PETER RICHTÁRIK

[AISTATS 2022](#)

22 Feb 2021

## ADOM: Accelerated Decentralized Optimization Method for Time-Varying Networks

DMITRY KOVALEV, EGOR SHULGIN, PETER RICHTÁRIK, ALEXANDER ROGOZIN, ALEXANDER GASNIKOV

[ICML 2021](#)

18 Feb 2021

## IntSGD: Floatless Compression of Stochastic Gradients

KONSTANTIN MISHCHENKO, BOKUN WANG, DMITRY KOVALEV, PETER RICHTÁRIK

[ICLR 2022](#)

16 Feb 2021

## Decentralized Distributed Optimization for Saddle Point Problems

ALEXANDER ROGOZIN, ALEXANDER BEZNOSIKOV, DARINA DVINSKIKH, DMITRY KOVALEV, PAVEL DVURECHENSKY, ALEXANDER GASNIKOV

[arXiv 2021](#)

15 Feb 2021

## A Linearly Convergent Algorithm for Decentralized Optimization: Sending Less Bits for Free!

DMITRY KOVALEV, ANASTASIA KOLOSKOVA, MARTIN JAGGI, PETER RICHTÁRIK, SEBASTIAN U. STICH

[AISTATS 2021](#)

03 Nov 2020

## Linearly Converging Error Compensated SGD

EDUARD GORBUNOV, DMITRY KOVALEV, DMITRY MAKARENKO, PETER RICHTÁRIK

[NeurIPS 2020](#)

23 Oct 2020

## Towards Accelerated Rates for Distributed Optimization over Time-varying Networks

ALEXANDER ROGOZIN, VLADISLAV LUKOSHKIN, ALEXANDER GASNIKOV, DMITRY KOVALEV, EGOR SHULGIN

[arXiv 2020](#)

23 Sep 2020

## Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization

DMITRY KOVALEV, ADIL SALIM, PETER RICHTÁRIK

[NeurIPS 2020](#)

21 Jun 2020

## From Local SGD to Local Fixed Point Methods for Federated Learning

GRIGORY MALINOVSKY, DMITRY KOVALEV, ELNUR GASANOV, LAURENT CONDAT, PETER RICHTÁRIK

[ICML 2020](#)

03 Apr 2020

## Acceleration for Compressed Gradient Descent in Distributed and Federated Optimization

ZHIZE LI, DMITRY KOVALEV, XUN QIAN, PETER RICHTÁRIK

[ICML 2020](#)

26 Feb 2020

## Fast Linear Convergence of Randomized BFGS

DMITRY KOVALEV, ROBERT M. GOWER, PETER RICHTÁRIK, ALEXANDER ROGOZIN

[arXiv 2020](#)

26 Feb 2020

## Variance Reduced Coordinate Descent with Acceleration: New Method With a Surprising Application to Finite-Sum Problems

FILIP HANZELY, DMITRY KOVALEV, PETER RICHTÁRIK

[ICML 2020](#)

11 Feb 2020

## Distributed Fixed Point Methods with Compressed Iterates

SÉLIM CHRAIBI, AHMED KHALED, DMITRY KOVALEV, PETER RICHTÁRIK, ADIL SALIM, MARTIN TAKÁČ

[arXiv 2019](#)

20 Dec 2019

## Accelerated methods for composite non-bilinear saddle point problem

MOHAMMAD ALKOUSA, DARINA DVINSKIKH, FEDOR STONYAKIN, ALEXANDER GASNIKOV, DMITRY KOVALEV

[Computational Mathematics and Mathematical Physics 2020](#)

09 Dec 2019

## Stochastic Newton and Cubic Newton Methods with Simple Local Linear-Quadratic Rates

DMITRY KOVALEV, KONSTANTIN MISHCHENKO, PETER RICHTÁRIK

[NeurIPS 2019 Workshop](#)

03 Dec 2019

## Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates

ADIL SALIM, DMITRY KOVALEV, PETER RICHTÁRIK

[NeurIPS 2019](#)

28 May 2019

## Revisiting Stochastic Extragradient

KONSTANTIN MISHCHENKO, DMITRY KOVALEV, EGOR SHULGIN, PETER RICHTÁRIK, YURA MALITSKY

[AISTATS 2020](#)

27 May 2019

## RSN: Randomized Subspace Newton

ROBERT M. GOWER, DMITRY KOVALEV, FELIX LIEDER, PETER RICHTÁRIK

[NeurIPS 2019](#)

26 May 2019

## Stochastic Distributed Learning with Gradient Quantization and Variance Reduction

SAMUEL HORVÁTH, DMITRY KOVALEV, KONSTANTIN MISHCHENKO, PETER RICHTÁRIK, SEBASTIAN U. STICH

[arXiv 2019](#)

04 Apr 2019

## Don't Jump Through Hoops and Remove Those Loops: SVRG and Katyusha are Better Without the Outer Loop

DMITRY KOVALEV, SAMUEL HORVÁTH, PETER RICHTÁRIK

[ALT 2020](#)

24 Jan 2019

## 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 2018](#)

28 Feb 2018

## Stochastic Spectral and Conjugate Descent Methods

DMITRY KOVALEV, EDUARD GORBUNOV, ELNUR GASANOV, PETER RICHTÁRIK

[NeurIPS 2018](#)

11 Feb 2018

## Conferences & Talks

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### ICCOPT 2019

TALK: «REVISITING STOCHASTIC EXTRAGRADIENT METHOD»

[TU, Berlin, Germany](#)

5 Aug. 2019

### Data Science Summer School 2019

POSTER: «STOCHASTIC DISTRIBUTED LEARNING WITH GRADIENT QUANTIZATION AND VARIANCE REDUCTION»

[École polytechnique, Paris, France](#)

26 Jun. 2019

### Traditional School (Control, Information and Optimization)

POSTER: «STOCHASTIC DISTRIBUTED LEARNING WITH GRADIENT QUANTIZATION AND VARIANCE REDUCTION»

[Voronovo, Moscow Region, Russia](#)

20 Jun. 2019

### Weekly seminar «Automatic control and Optimization Theory»

TALK: «STOCHASTIC SPECTRAL AND CONJUGATE DESCENT METHODS»

[IPU, Moscow, Russia](#)

26 Mar. 2019

### **Seminar «Modern Optimization Methods»**

TALK: «STOCHASTIC DISTRIBUTED LEARNING WITH GRADIENT QUANTIZATION AND VARIANCE REDUCTION»

*MIPT, Moscow, Russia*

*25 Mar. 2019*

### **Traditional School (Control, Information and Optimization)**

POSTER: «STOCHASTIC SPECTRAL DESCENT METHODS»

*Voronovo, Moscow Region, Russia*

*Jun. 2018*

### **Optimization and Big Data Workshop**

POSTER: STOCHASTIC SPECTRAL DESCENT METHODS

*KAUST, Thuwal, Saudi Arabia*

*Feb. 2018*