Peter Richtárik: Curriculum Vitae

1. CONTACT DETAILS

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2. RESEARCHER IDs

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3. RESEARCH INTERESTS

◇ machine learning, federated learning, empirical risk minimization
◇ big data optimization, convex and non-convex optimization; 0th, 1st, and 2nd order optimization methods
◇ randomized algorithms, randomized coordinate descent, stochastic gradient descent, variance reduction
◇ randomized numerical linear algebra
◇ parallel and distributed computing, supercomputing, gradient compression

4. ACADEMIC POSITIONS

2019–now	**Professor**, Computer Science, King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia
2017–2019	**Visiting Professor**, Moscow Institute of Physics and Technology, Russia
2017–2019	**Associate Professor**, Computer Science, KAUST, Kingdom of Saudi Arabia
2016–2019	**Associate Professor (Reader)**, Mathematics, University of Edinburgh
2013	**Invited Visiting Scientist**, Simons Institute for the Theory of Computing, UC Berkeley
2009–2016	**Assistant Professor (Lecturer)**, School of Mathematics, University of Edinburgh
2007–2009	**Postdoctoral Fellow**, Center for Operations Research and Econometrics and Department of Mathematical Engineering, Catholic University of Louvain, Belgium (host: Yu. Nesterov)

5. EDUCATION

2007	**PhD, Operations Research, Cornell University**
2006	MS, Operations Research, Cornell University
2001	Mgr, Mathematics, Comenius University, Slovakia, 100% academic grades, ranked #1
2001	Bc, Management, Comenius University, Slovakia, 100% academic grades, ranked #1
2000	Bc, Mathematics, Comenius University, Slovakia, 100% academic grades, ranked #1

6. AWARDS & RECOGNITIONS

Awards explicitly addressed to my students, postdocs or coauthors for a talk, poster or paper based on joint research with me are listed in the section "8.4 My Team: Awards and Recognitions".

2022	**Spotlight Paper at ICLR 2022** (for paper [156])
2021	**Oral Paper at NeurIPS 2021** (less than 1% acceptance rate; paper [167])

2021	**2020 COAP Best Paper Award**[1] (for paper [65])
2021	**One of the 10 Most Cited Articles Published in SIMAX Since 2019**[2] for paper [56]
2020	**Best Paper Award at the NeurIPS 2020 Workshop on Scalability, Privacy, and Security in Federated Learning** for paper [135]
2020	**Top 30–50 author in ICML 2020** (in number of papers accepted)
2020	1st Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [39]
2020	3rd Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [44]
2020	3rd Most Downloaded Paper in "SIAM J. on Optimization" for paper [57]
2020	4th Most Downloaded Paper in "SIAM J. on Optimization" for paper [21]
2019	1st Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [39]
2019	4th Most Downloaded Paper in "SIAM J. on Optimization" for paper [57]
2019	5th Most Downloaded Paper in "SIAM J. on Optimization" for paper [21]
2019	10th Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [44]
2019	**Interviewed by Robin.ly for their "Leaders in AI" platform at NeurIPS 2019**[3]
2019	**Best NeurIPS Reviewer Award**[4]
2019	**Distinguished Speaker Award,** Int. Conf. on Continuous Optimization, Berlin, Germany
2018	**Best NeurIPS Reviewer Award**[5]
2018	2nd Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [39]
2018	6th Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [44]
2017	1st Most Read Paper in "Optimization Methods and Software" for paper [41]
2017	1st Most Downloaded Paper in "SIAM J. on Matrix Analysis and Applications" for paper [39]
2017	1st Most Trending Paper in "Mathematical Programming" for paper [10]
2017	**Announcement of "Federated Learning"** by Google (based on papers [51, 52])
2016–2017	2nd Most Downloaded Paper in "SIAM J. on Optimization" for paper [21]
2016	**SIAM SIGEST Outstanding Paper Award** for paper [21]
2016	**EUSA Best Research or Dissertation Supervisor Award**[6] (2nd Prize)
2016–now	**Turing Fellow, The Alan Turing Institute**, London
2016	**EPSRC Fellowship in Mathematical Sciences**[7]
2014	Nominated for the **Chancellor's Rising Star Award**[8], University of Edinburgh
2013	**Simons Institute Visiting Scientist Fellowship**, UC Berkeley
2013	Nominated for the **2014 Microsoft Research Faculty Fellowship**[9]
2011 & 2012	Nominated for the **Innovative Teaching Award**, University of Edinburgh
2011–2017	**Honorary Fellow**, Heriot-Watt University
2007	**CORE Fellowship**, Université catholique de Louvain
2002	**Cornell University Graduate Fellowship**
2001	**Dean's Prize and Rector's Prize**, Comenius University
1992–2001	Winner of Numerous Mathematical Olympiads and Competitions

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[1]For the best paper published in Computational Optimization and Applications in 2020.

[2]https://sinews.siam.org/Details-Page/10-most-highly-cited-articles-from-simax-since-2019-1

[3]From Robin.ly LinkedIn Post: "We are interviewing the world's leading AI academics this week at NeurIPS2019. Look forward to sharing much more on the state of AI research, how it's fuelling AI commercialization & what we can expect from AI in the next decade. Spotlight interviews with Yoshua Bengio, Peter Richtárik, Charles Onu, Max Welling, Shimon Whiteson, Sharon Zhou, Liwei Wang, Song Han & many more. "

[4]"Thank you for all your hard work reviewing for NeurIPS 2019! We are delighted to inform you that you were one of the 400 highest-scoring reviewers this year! You will therefore be given access (for a limited period of time) to one free registration to this year's conference; you will later receive additional information by email explaining how to access your registration. "

[5]"We are delighted to inform you that you were one of the 218 highest-scoring reviewers this year! You will therefore be given access (for a limited period of time) to one free registration to this year's conference."

[6]EUSA = Edinburgh University Students' Association. One first and one second prize are given each year across all disciplines and levels of seniority at the University of Edinburgh.

[7]In total, 5 fellowships in mathematics were awarded in the UK in this round at all levels of seniority.

[8]One of two nominated from the School of Mathematics.

[9]Selected universities can nominate a single candidate. No European scientists got the award in 2014.

7. GRANTS

7.1 MY GRANTS[10]

2021–2022	**$540,000 (PI)**, KAUST Baseline Research Grant[11]
2021–2022	**$100,000 (PI)**, AI Initiative Funding
2020–2021	**$540,000 (PI)**, KAUST Baseline Research Grant
2020	**$100,000 (PI)**, AI Initiative Seed Funding, "Algorithmic, Systems and Privacy Aspects of Split Learning", Joint with: Marco Canini (KAUST, Co-I) and Panos Kalnis (KAUST, Co-I)
2019–2020	**$200,000 (PI)**, Extreme Computing Research Center (ECRC) funding, KAUST, "Optimization for Machine Learning", Joint with: Tong Zhang (HKUST, PI)
2019–2020	**$540,000 (PI)**, KAUST Baseline Research Grant
2018–2019	**£216,843 (Co-I)**, Innovate UK Grant, "Renewable Energy Performance Score (REPSCORE)", Joint with: Enian (PI), Daniel Friedrich (Edinburgh, PI)
2018–2021	**$974,789 (Co-I)**, CRG2017 Grant, "Analyzing Large Scale 3D Shape Collections", Joint with: Peter Wonka (KAUST, PI), Maks Ovsjanikov (École Polytechnique, Co-I)
2017–2019	**RUB 7,960,000 (PI)**, Visiting Professor Grant, Moscow Institute of Physics and Technology
2018	**$10,000 (PI)**, KICP grant in support of KAUST Research Workshop on Optimization and Big Data, 2018
2018–2019	**$400,000 (PI)**, KAUST Baseline Research Grant[12]
2017–2018	**$79,281 (PI)**, KAUST Office of Sponsored Research Conference Support Grant URF/1/3347-01, "Optimization and Big Data", Joint with: Marco Canini (KAUST, PI)
2016–2020	**£70,000** EPSRC CASE[13] PhD Studentship for Filip Hanzely
2017–2018	**$400,000 (PI)**, KAUST Baseline Research Grant
2016–2017	**$133,333 (PI)**, KAUST Baseline Research Grant (4 months of cover: March-June 2017)
2016–2020	**£45,000 (PI)**, Amazon Research Grant
2016–2020	**£823,211 (PI)**, EPSRC Early Career Fellowship in Mathematical Sciences EP/N005538/1, "Randomized Algorithms for Extreme Convex Optimization"
2016–2020	**$20,000 (PI)**, Amazon EC2 Grant (partner funding associated with the EPSRC Fellowship)
2015	**£20,000 (PI)**, Alan Turing Institute Scoping Workshop Grant, "Distributed Machine Learning and Optimization", Joint with: Artur Czumaj (Warwick, PI), Ilias Diakonikolas (Edinburgh, PI), Mark Girolami (Warwick, PI), Raphael Hauser (Oxford, PI), John Shawe-Taylor (UCL, PI)
2015	**£12,000 (PI)**, Alan Turing Institute Scoping Workshop Grant, "Theoretical and Computational Approaches to Large Scale Inverse Problems", Joint with: Simon Arridge (UCL, PI), John Aston (Cambridge, PI), Carola-Bibiane Schönlieb (Cambridge, PI), Andrew Stuart (Warwick, PI), Jared Tanner (Oxford, PI)
2014–2017	**$180,000**, Google Europe Doctoral Fellowship for Jakub Konečný
2013–2015	**£125,849 (PI)**, EPSRC First Grant EP/K02325X/1, "Accelerated Coordinate Descent Methods for Big Data Optimization"
2014–2015	**£40,000 (PI)**, School of Mathematics Grant, "Accelerated Coordinate Descent Methods for Big Data Optimization", matching funding for my postdoc Z. Qu
2013	**£18,785 (PI)**, NAIS Travel Grant, my 2 students spending semester at Berkeley
2012–2014	**£66,300 (PI)**, NAIS Lecturer Grant, paying for a proportion of my time
2012–2014	**£10,000 (PI)**, NAIS Startup Grant
2012–2013	**£49,518 (Co-I)**, EPSRC grant EP/J020567/1, "Algorithms for Data Simplicity", Joint with: Jared Tanner (Oxford, PI)
2011–2014	**£646,264 (Co-I)**, EPSRC and RCUK grant EP/I017127/1, "Mathematics for Vast Digital Resources", Joint with: Burak Büke (Edinburgh, Co-I) and Jacek Gondzio (Edinburgh, PI)

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[10]All small grants (value below $10k) are excluded from this list. The total value of the 16 small grants excluded is £42,090.

[11]Unrestricted basic research funding offered each year to KAUST Professors.

[12]Unrestricted basic research funding offered each year to KAUST Associate Professors.

[13]CASE = Cooperative Awards in Science and Engineering

7.2 GRANTS I HELPED TO PREPARE[14]

2014–2019	£42 million + £5 million, "The Alan Turing Institute". I am one of a small number of people who helped to prepare Edinburgh's bid.
2014–2023	£4.5 million, EPSRC grant, "Maxwell Institute Graduate School in Mathematical Analysis and Applications", PI: Anthony Carbery (Edinburgh). I am one of the named PhD supervisors on the grant.
2014–2021	£5.03 million, EPSRC grant, "Centre for Doctoral Training in Data Science", PI: Chris Williams (Edinburgh). I am one of 45 named potential PhD advisors at U of Edinburgh.

8. MY TEAM

8.1 MY TEAM @ KAUST

01/2022–07/2022	Intern: Abdurakhmon Sadiev (from MIPT, Russia)
11/2021–now	Postdoc: Avetik Karagulyan (from CREST, France)
11/2021–02/2022	Intern: Navish Kumar (from IIT Kharagpur, India)
07/2021–11/2021	Intern: Muhammad Harun Khan (from Imperial College, UK)
07/2021–10/2021	Intern: Rafal Szlendak (from Warwick University, UK)
06/2021–now	Postdoc: Alexander Tyurin (from MIPT, Russia)
06/2021–8/2021	Intern: Bokun Wang (from UC Davis, USA)
03/2021–now	PhD student: Lukang Sun (from Nanjing University, China)
03/2021–8/2021	Intern: Rustem Islamov[15] (from TU Munich, Germany)
03/2021–11/2021	Intern: Ilyas Fatkhullin[16] (from TU Munich, Germany)
09/2020–03/2022	Research Scientist: Zhize Li (from Tsinghua University, China)
10/2020–03/2021	Intern: Bokun Wang (from UC Davis, USA)
09/2020–02/2021	Intern: Eduard Gorbunov (from MIPT, Russia)
08/2020–now	PhD student: Konstantin Burlachenko (from Bauman Moscow State TU, Russia)
08/2020–now	MS student: Igor Sokolov (from MIPT, Russia)
08/2020–now	MS student: Grigory Malinovsky (from MIPT, Russia)
08/2020–09/2020	Intern: Wenlin Chen (from University of Manchester, UK)
06/2020–11/2020	Intern: Rustem Islamov (from MIPT, Russia)
05/2020–06/2020	Intern: Othmane Sebbouh (from École Polytechnique, France)
05/2020–10/2020	Intern: Ahmed Khaled Ragab (from Cairo University, Egypt)
02/2020–12/2020	Research Scientist: El Houcine Bergou (from Toulouse, France)
02/2020–now	MS/PhD student: Egor Shulgin (from MIPT, Russia)
02/2020–03/2020	Intern: Eduard Gorbunov (from MIPT, Russia)
01/2020–02/2020	Intern: Alexander Rogozin (from MIPT, Russia)
01/2020–02/2020	Intern: Aleksandr Beznosikov (from MIPT, Russia)
01/2020–02/2020	Intern: Grigory Malinovsky (from MIPT, Russia)
01/2020–now	PhD student: Elnur Gasanov (continuing after MS from KAUST)
01/2020–now	PhD student: Dmitry Kovalev (continuing after MS from KAUST)
11/2019–now	Research Scientist: Laurent Condat (from Grenoble, France)
10/2019–now	Postdoc: Mher Safaryan (from Yerevan State University, Armenia)
09/2019–08/2020	Postdoc: Zhize Li (from Tsinghua University, China)
08/2019–12/2020	MS student: Alyazeed Basyoni (from Carnegie Mellon University, USA)
08/2019–now	MS/PhD student: Slavomír Hanzely (from Comenius University, Slovakia)
06/2019–09/2019	Intern: Ahmed Khaled Ragab (from Cairo University, Egypt)
03/2019–09/2019	Intern: Sélim Chraibi (from Grenoble, France)

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[14]Large grants which I helped to prepare but where I am not formally an investigator.

[15]I have supervised Rustem Islamov's BS thesis at MIPT. Rustem is now an MS student at Institut Polytechnique de Paris, France.

[16]I have supervised Ilyas Fatkhullin's MS thesis at TU Munich. Ilyas is now a PhD student at ETH Zürich Switzerland.

02/2019–10/2021	Postdoc: Adil Salim (from Télécom ParisTech, France)
02/2019–03/2019	Intern: Ľudovít Horváth (from Comenius University, Slovakia)
01/2019–02/2019	Intern: Dmitry Kamzolov (from MIPT, Russia)
01/2019–02/2019	Intern: Vladislav Elsukov (from MIPT, Russia)
01/2019–02/2019	Intern: Igor Sokolov (from MIPT, Russia)
01/2019–02/2019	Intern: Egor Shulgin (from MIPT, Russia)
01/2019–02/2019	Intern: Eduard Gorbunov (from MIPT, Russia)
01/2019–03/2022	PhD student: Alibek Sailanbayev (continuing after MS from KAUST)
01/2019–now	PhD student: Samuel Horváth (continuing after MS from KAUST)
11/2018–11/2021	Postdoc: Xun Qian (from Hong Kong Baptist University, Hong Kong)
09/2018–12/2019	MS student: Elnur Gasanov (from MIPT, Russia)
09/2018–12/2019	MS student: Dmitry Kovalev (from MIPT, Russia)
03/2018–08/2018	Intern: Sarah Sachs[17] (from TU Munich, Germany)
01/2018–02/2018	Intern: Eduard Gorbunov (from MIPT, Russia)
01/2018–02/2018	Intern: Elnur Gasanov (from MIPT, Russia)
01/2018–02/2018	Intern: Dmitry Kovalev[18] (from MIPT, Russia)
01/2018–02/2018	Intern: Slavomír Hanzely[19] (from Comenius University, Slovakia)
01/2018–01/2019	Postdoc: El Houcine Bergou (from Institut National Polytechnique, Toulouse, France)
10/2017–11/2017	Intern: Nikita Doikov (from HSE Moscow, Russia)
08/2017–12/2017	PhD student: Viktor Lukáček[20] (from Comenius University, Slovakia)
08/2017–12/2021	PhD student: Konstantin Mishchenko (from ENS, France)
08/2017–11/2020	PhD student: Filip Hanzely (now: Research Assistant Professor, TTIC)
08/2017–12/2018	MS student: Alibek Sailanbayev (from Nazarbayev University, Kazakhstan)
08/2017–12/2018	MS student: Samuel Horváth (from Comenius University, Slovakia)
05/2017–05/2019	Postdoc: Aritra Dutta (from University of Central Florida, USA)
05/2017–07/2017	Intern: Atal Sahu (from IIT Kanpur, India)
05/2017–07/2017	Intern: Aashutosh Tiwari (from IIT Kanpur, India)

8.2 MY TEAM @ MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY

09/2018–10/2019	Dmitry Kamzolov
09/2018–10/2019	Vladislav Elsukov
09/2018–10/2019	Igor Sokolov (now: MS student in my team at KAUST)
08/2018–10/2019	Egor Shulgin (now: MS/PhD student in my team at KAUST)
10/2017–10/2019	Eduard Gorbunov (now: PhD student at MIPT)
10/2017–8/2018	Dmitry Kovalev (now: PhD student in my team at KAUST)
10/2017–8/2018	Elnur Gasanov (now: PhD student in my team at KAUST)

8.3 MY TEAM @ UNIVERSITY OF EDINBURGH

09/2016–07/2017	PhD student: Filip Hanzely (transferred to KAUST after 1 year in Edinburgh to follow me, with an MS degree with distinction)
03/2016–07/2016	Postdoc: Robert M. Gower
10/2015–06/2019	PhD student: Nicolas Loizou (now: Postdoc, MILA, Montréal)
10/2015–02/2017	PhD student: Theo Pavlakou (now: Google; 2nd advisor; main advisor: Iain Murray)
03/2015–03/2016	PhD student: Robert M. Gower (now: Assistant Prof. at Télécom ParisTech)
03/2015–06/2015	Visiting PhD student: Luca Bravi (from University of Florence)
10/2014–03/2015	Postdoc: Ademir Ribeiro (now: Associate Prof. at University of Paraná)

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[17]I have supervised Sarah Sachs' MS thesis at TU Munich.
[18]I have supervised Dmitry Kovalev's BS thesis at MIPT.
[19]I have supervised Slavomír Hanzely's BS thesis at Comenius University.
[20]Viktor Lukáček left after spending 1 semester at KAUST as he realized PhD was not the right path for him.

09/2014–11/2017	PhD student: Dominik Csiba (now: Algo Lead at Nozdormu, Slovakia)
08/2013–07/2017	PhD student: Jakub Konečný (now: Research Scientist, Google)
12/2013–08/2015	Postdoc: Zheng Qu (now: Assistant Prof. at University of Hong Kong)
09/2012–02/2013	Visiting PhD student: Minnan Luo (now: Associate Prof. at Xi'an Jiaotong University)
10/2012–07/2014	Postdoc: Olivier Fercoq (now: Assistant Prof. at Télécom ParisTech)
02/2012–07/2014	Postdoc: Rachael Tappenden (now: Assistant Prof. at University of Canterbury)
01/2012–06/2012	Postdoc: Jakub Mareček (now: IBM Research, Dublin)
09/2010–03/2014	PhD student: Martin Takáč (now: Associate Prof. at Mohammed bin Zayed University of Artificial Intelligence, USA)
2010–2015	Supervised 20 MSc Dissertations
2010–2015	Supervised 7 undergraduate students supported by research scholarships (EPSRC, Nuffield, College, . . .)

8.4 MY TEAM: AWARDS & RECOGNITIONS[21]

2022 (Horváth)	Joins **Mohamed bin Zayed University of Artificial Intelligence**, Abu Dhabi, UAE, as an **Assistant Professor**
2022 (Safaryan)	**AISTATS 2022 Top Reviewer**
2022 (Burlachenko)	Research Internship at Facebook Research, USA
2022 (Loizou)	Joins **The Johns Hopkins University as an Assistant Professor** in the Department of Applied Mathematics & Statistics, and the Mathematical Institute for Data Science (MINDS), with a secondary appointment in Computer Science
2022 (Khaled)	Joins **Princeton University** as a **PhD Student in the ECE Department**[22]
2021 (Malinovsky)	**2021 CEMSE Student Research Excellence Award**[23]
2021 (Kovalev)	**2021 CEMSE Student Research Excellence Award**[24]
2021 (Horváth)	**2021 Al-Kindi Statistics Research Student Award**[25]
2021 (Mishchenko)	**Rising Stars in Data Science**; invited talk to a workshop at the University of Chicago[26]
2021 (Gorbunov)	**NeurIPS 2021 Outstanding (Top 8%) Reviewer Award**
2021 (Mishchenko)	**NeurIPS 2021 Outstanding (Top 8%) Reviewer Award**
2021 (Shulgin)	Research Internship at Samsung AI Research Center, Cambridge, UK
2021 (Horváth)	Research Internship at Facebook AI Research, Canada
2021 (Mishchenko)	**ICML 2021 Top 10% Reviewer**
2021 (Gorbunov)	**ICML 2021 Top 10% Reviewer**
2021 (K. Mishchenko)	**ICML 2021 Expert Reviewer**
2021 (F. Hanzely)	**ICML 2021 Expert Reviewer**
2021 (Gorbunov)	**ICML 2021 Expert Reviewer**
2021 (Kovalev and Gasanov)	**Best Student Paper Award** at the International Workshop on Federated Learning for User Privacy and Data Confidentiality in Conjunction with ICML 2021 (for joint paper [166])

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[21]All travel grant awards are excluded.

[22]https://rka97.github.io

[23]Given annually to a handful of the best Applied Mathematics students at KAUST. "The recipients exemplify the highest of academic standards and represent our confidence in your future contributions to the KAUST community, academia, and science."

[24]Given annually to a handful of the best Computer Science students. "The recipients exemplify the highest of academic standards and represent our confidence in your future contributions to the KAUST community, academia, and science."

[25]Given annually to a handful of the best Statistics students at KAUST. "The recipients exemplify the highest of academic standards and represent our confidence in your future contributions to the KAUST community, academia, and science."

[26]The Rising Stars in Data Science workshop at the University of Chicago focuses on celebrating and fast tracking the careers of exceptional data scientists at a critical inflection point in their career: the transition to postdoctoral scholar, research scientist, industry research position, or tenure track position. An event associated with the The Center for Data and Computing (CDAC) at the University of Chicago.

2021 (Kovalev)	**Ilya Segalovich Prize for Young Researchers**[27]
2021 (Mishchenko)	**Most Popular Spotlight Talk** (2nd place) at KAUST Conference on AI
2021 (Mishchenko)	**ICLR 2021 Outstanding Reviewer Award**
2021 (Gorbunov)	**ICLR 2021 Outstanding Reviewer Award**
2020 (F. Hanzely)	Joined **Toyota Tech. Institute at Chicago as a Research Assistant Professor**
2020 (Mishchenko)	**2020 CEMSE Student Research Excellence Award**[28]
2020 (Horváth)	**Best Paper Award at the NeurIPS 2020 Workshop on Scalability, Privacy, and Security in Federated Learning** (for joint paper [135])
2020 (Loizou)	**Runner Up for OR Society Best Doctoral Dissertation Prize**[29] (for year 2019)
2020 (Horváth)	**NeurIPS 2020 Best Reviewer Award**
2020 (Gorbunov)	**NeurIPS 2020 Best Reviewer Award**
2020 (F. Hanzely)	**NeurIPS 2020 Best Reviewer Award**
2020 (Condat)	**NeurIPS 2020 Best Reviewer Award**
2020 (Khaled)	**NeurIPS 2020 Best Reviewer Award**
2020 (Horváth)	Research Internship at Samsung AI Research Center, Cambridge, UK
2020 (Mishchenko)	Research Internship at Google, USA (performed remotely due to Covid-19)
2020 (Kovalev)	**Ilya Segalovich Prize for Young Researchers**[30]
2020 (Burlachenko)	Dean's Award[31], KAUST
2020 (Malinovsky)	Dean's Award, KAUST
2020 (Mishchenko)	**AAAI 2020 Outstanding Program Committee Member Award** (awarded to top 12 out of over 6,000 reviewers)
2019 (Mishchenko)	**NeurIPS 2019 Best Reviewer Award**
2019 (S. Hanzely)	Dean's Award, KAUST
2019 (F. Hanzely)	Research Internship at Google, New York
2019 (Horváth)	Research Internship at Amazon, Berlin
2019 (Sailanbayev)	Research Internship at Intel, Germany
2018 (Kovalev)	Dean's Award, KAUST
2018 (Loizou)	Research Internship at Facebook AI Research (FAIR), Montréal
2018 (Mishchenko)	Research Internship at Amazon, Seattle
2018 (F. Hanzely)	Research Internship at Microsoft Research (with Lin Xiao)
2018 (F. Hanzely)	Research Internship at Amazon, Berlin, Scalable Machine Learning Group
2018 (Horváth)	**Best DS³ Poster Award**[32], Paris (1st Prize; for joint paper [81])
2018 (Doikov)	**Best Talk Award**[33], Voronovo, Russia (1st Prize; for joint paper [69])
2018 (F. Hanzely)	WEP Best Poster Award (3rd Place), KAUST
2017 (Mishchenko)	Dean's Award, KAUST
2017 (Lukáček)	Dean's Award, KAUST
2017 (F. Hanzely)	Dean's Award, KAUST
2017 (Gower)	**18th IMA Leslie Fox Prize**[34] (2nd Prize; for joint paper [39])
2016 (Csiba)	Postgraduate Essay Prize, School of Mathematics, University of Edinburgh

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[27]Four awards were given; each award carries a cash prize of 1,000,000 RUB ($\approx$ 14,000 USD).

[28]One of 5 awards given to KAUST Computer Science students.

[29]The OR Society was created in April 1948 as the Operational Research Club, becoming the OR Society in 1953. It is the world's oldest-established learned society catering to the OR profession and one of the largest in the world, with members in 53 countries https://en.wikipedia.org/wiki/Operational_Research_Society.

[30]Nine awards were given in the area of Computer Science; each award carries a cash prize of 350,000 RUB ($\approx$ 5,000 USD).

[31]A financial add-on to the KAUST Fellowship, worth 6,000 USD annually, given to a few best incoming students by the Dean.

[32]DS³ stands for Data Science Summer School, held at École Polytechnique, Paris, during June 25–29, 2018. There were 170 posters in the competition, from MS and PhD students, and postdocs. Samuel's poster, based on joint work [81], won the main prize, which also attracted a 500 EUR check.

[33]Event: "Traditional Youth School in Control, Information and Optimization", organized by Boris Polyak.

[34]"The Leslie Fox Prize is a biennial prize established in 1985 by the IMA in honour of mathematician Leslie Fox (1918-1992). The prize honours young numerical analysts worldwide (any person less than 31 years old), and applicants submit papers for review. A committee [...] awards First Prize and Second Prizes based on mathematical and algorithmic brilliance in tandem with presentational skill"

2016 (F. Hanzely)	**CASE PhD Studentship** (£93,333 award; 3/4 from EPSRC, 1/4 from Amazon)
2016 (Loizou)	A. G. Leventis Foundation Grant for PhD studies
2015 (Takáč)	**OR Society Best Doctoral Dissertation Prize** (for year 2014)
2015 (Loizou)	A. G. Leventis Foundation Grant for PhD studies
2015 (Loizou)	Principal's Career Development Scholarship[35] (in Data Science)
2015 (Kisiala)	Best Student Prize[36], OR MSc Programme, School of Mathematics, Edinburgh
2015 (Fercoq)	**17th IMA Leslie Fox Prize** (2nd Prize; for joint paper [21])
2015 (Csiba)	**Best Contribution Award** (2nd Prize; for joint paper [35]), Workshop: Optimization and Big Data, Edinburgh. Committee: Arkadi Nemirovskii (Georgia Tech) and Rodolphe Jenatton (Amazon)
2015 (Konečný)	**BASP Frontiers Best Contribution Award** (1st prize in the field of signal processing; for joint paper [20]), Villars-sur-Ollon, Switzerland
2014 (Konečný)	**Google European Doctoral Fellowship**[37] ($180,000 unrestricted gift funding Jakub's PhD for 3 years)
2014 (Csiba)	Principal's Career Development Scholarship (in Data Science)
2013 (Konečný)	Principal's Career Development Scholarship (in Data Science)
2013 (Takáč)	**16th IMA Leslie Fox Prize** (2nd Prize; for joint paper [10])
2013 (Takáč)	SIAM Certificate in Recognition of Outstanding Efforts and Accomplishments, on behalf of the SIAM Chapter at the University of Edinburgh for academic year 2012–2013
2012 (Takáč)	**INFORMS Computing Society Best Student Paper Prize** (sole runner up; for joint paper [8]), Phoenix, Arizona
2012 (Banks-Watson)	Best Student Prize, OR MSc Programme, School of Mathematics, Edinburgh
2012 (Takáč)	**Best Talk Award**, SIAM National Student Chapter Conference, Manchester, UK
2012 (Takáč)	Best Talk Award, Edinburgh Postgraduate Colloquium, University of Edinburgh
2012 (Takáč)	Alice Margaret Campbell Bequest Fund Award for success in 1st year of PhD
2011 (Takáč)	Certificate of Appreciation, 24th Biennial Conf. on Numerical Analysis, Glasgow, UK
2011 (Takáč)	Best Poster Award, SIAM Student Chapter Conference, Edinburgh, UK

8.5 MY TEAM: SELECTED INDEPENDENT ACHIEVEMENTS[38]

2021 (Condat)	Associate Editor, IEEE Transactions on Signal Processing
2020 (Basyoni)	National Deputy Leader and Head Coach at the International Olympiad of Informatics, Saudi Arabia
2019 (Basyoni)	National Deputy Leader and Head Coach at the International Olympiad of Informatics, Saudi Arabia
2019 (Li)	Tsinghua Outstanding Doctoral Dissertation Award
2018 (Mishchenko & Sailanbayev)	80th Place, 2018 IEEEXtreme programming competition[39]
2017 (S. Hanzely)	8–10th Place, Vojtech Jarník International Mathematical Competition (1st place among Czech and Slovak contestants)
2017 (Horváth)	37th Place, Vojtech Jarník International Mathematical Competition, Ostrava, Czech Republic
2016 (Malinovsky)	Abramov's Scholarship for students with the best grades at MIPT

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[35]Principal's Career Development Scholarship: A highly competitive scholarship offered to 3 incoming PhD students in mathematics at the University of Edinburgh each year.

[36]For best performance in courses and MSc Dissertation, which I supervised.

[37]Google quote: "Nurturing and maintaining strong relations with the academic community is a top priority at Google. Today, we're announcing the 2014 Google PhD Fellowship recipients. These students, recognized for their incredible creativity, knowledge and skills, represent some of the most outstanding graduate researchers in computer science across the globe. We're excited to support them, and we extend our warmest congratulations."

[38]These awards are independent of my input.

[39]4,000 teams (of size 3) from all over the world competed in a 24-hour time span against each other to solve a set of programming problems. Konstantin and Alibek scored high despite being just 2 on the team!

2016 (S. Hanzely)	Participation, 57th International Mathematical Olympiad, Hong Kong
2016 (S. Hanzely)	3rd Place, Slovak National Mathematical Olympiad
2016 (S. Hanzely)	1st Place, Slovak Mathematical Olympiad, Regional Round
2016 (S. Hanzely)	1st Place, Slovak Informatics Olympiad, Regional Round
2016 (Horváth)	36th Place, Vojtech Jarník International Mathematical Competition, Ostrava, Czech Republic
2016 (Horváth)	3rd Prize, International Mathematical Competition for University Students, Blagoevgrad, Bulgaria
2016 (Sailanbayev)	Semifinal, Programming Contest ACM ICPC in NEERC region, Almaty, Kazakhstan
2015 (S. Hanzely)	Bronze Medal, Middle European Mathematical Olympiad
2015 (S. Hanzely)	2nd Place, Slovak Informatics Olympiad, Regional Round
2015 (Sailanbayev)	2nd Prize, International Mathematical Competition for University Students, Blagoevgrad, Bulgaria
2015 (Mishchenko)	1st Prize, HSE Olympiad in Applied Mathematics and Informatics, Moscow, Russia
2014 (Malinovsky)	Bronze Medal, International Zhautykov Olympiad in Physics
2014 (Malinovsky)	Participant, All-Russian Physics Olympiad
2014 (S. Hanzely)	1st Place, Slovak Mathematical Olympiad, Regional Round
2014 (Kovalev)	Honorable Mention, 15th Asian Physics Olympiad, Singapore
2014 (Kovalev)	Winner, All Russian Mathematics Olympiad (Moscow Region)
2014 (Kovalev)	Winner, All Russian Computer Science Olympiad (Moscow Region)
2014 (Kovalev)	Prizewinner, All Russian Physics Olympiad
2014 (Mishchenko)	3rd Prize, MIPT Student Mathematical Olympiad, Moscow, Russia
2014 (Horváth)	18th Place, National Mathematical Olympiad, Bratislava, Slovakia
2014 (Horváth)	1st Place, Nitra Region Mathematical Olympiad, Category A, Slovakia
2014 (Sailanbayev)	2nd Prize, International Mathematical Competition for University Students, Blagoevgrad, Bulgaria
2014 (Loizou)	Top 1% in Mathematics at National and Kapodestrian University of Athens, Greece
2014 (Csiba)	Best Student Work in Applied Informatics in Czech and Slovak Republic, Annual Student Scientific Conference, Ústí nad Labem, Czech Republic
2014 (F. Hanzely)	2nd Prize (101st place), International Mathematical Competition for University Students, Blagoevgrad, Bulgaria
2014 (F. Hanzely)	9th Place, V. Jarník International Mathematical Competition, Ostrava, Czech Republic
2014 (Lukáček)	26th Place, Vojtech Jarník International Mathematical Competition, Ostrava, Czech Republic
2013 (Malinovsky)	Prizewinner, All-Russian Physics Olympiad
2013 (S. Hanzely)	1st Place, Slovak Mathematical Olympiad, Regional Round
2013 (Kovalev)	Winner, All Russian Physics Olympiad
2013 (Sailanbayev)	Silver Medal, International Mathematical Olympiad, Santa Marta, Colombia
2013 (F. Hanzely)	Bronze Medal, International Mathematical Olympiad, Santa Marta, Colombia
2013 (Sailanbayev)	1st Place, National Mathematical Olympiad, Kazachstan
2013 (F. Hanzely)	1st Place, Slovak National Round of Mathematical Olympiad, Košice, Slovakia
2013 (Sailanbayev)	Gold Medal, International Zhautykov Olympiad, Almaty, Kazakhstan
2013 (Lukáček)	20th Place, Vojtech Jarnik International Mathematical Competition, Ostrava, Czech Republic
2012 (Kovalev)	Prizewinner, All Russian Physics Olympiad
2012 (Lukáček)	3rd Prize, International Mathematical Competition for University Students, Blagoevgrad, Bulgaria
2012 (Mishchenko)	1st Prize, Moscow Mathematical Olympiad, Moscow, Russia
2012 (Mishchenko)	1st Prize, PhysTech International Olympiad in Mathematics
2012 (Basyoni)	Silver Medal[40], International Mathematical Olympiad, Mar del Plata, Argentina
2012 (Sailanbayev)	Bronze Medal, International Mathematical Olympiad, Mar del Plata, Argentina

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[40]Historically the first silver medal at IMO by Saudi Arabia.

2012 (Sailanbayev)	Silver Medal, Balkan Mathematical Olympiad, Antalya, Turkey
2012 (F. Hanzely)	Bronze Medal, Middle European Mathematical Olympiad, Solothurn, Switzerland
2012 (Csiba)	FIDE International Master in Chess
2012 (Csiba)	3rd Prize, International Mathematical Competition, Blagoevgrad, Bulgaria
2012 (Konečný)	2nd Prize, International ChaLearn Competition, One shot learning of gestures from Microsoft Kinect videos
2012 (Fercoq)	Gaspard Monge Prize "for best PhD thesis defended in France 2012 in mathematics or computer science, with significant contributions to Optimization and Operations Research"
2012 (Luo)	Google Anita Borg Scholarship, China
2012 (Lukáček)	2nd Place, International Correspondence Seminar in Mathematics (iKS)
2011 (Lukáček)	Bronze Medal (26th Place), Middle European Mathematical Olympiad, Varaždin, Croatia
2010 (Konečný)	Honourable Mention, International Mathematical Olympiad, Astana, Kazachstan
2010 (Csiba)	Honourable Mention, Middle European Mathematical Olympiad, Žilina, Slovakia
2008 (Konečný)	Honourable Mention, Middle European Mathematical Olympiad, Olomouc, Czech Republic
2007–2009 (Takáč)	Winner, 3rd Place and Honourable Mention (twice), International Student Scientific Conference, Czech and Slovak Republic

9. TALKS

9.1 TALKS: SUMMARY

I have given **more than 190 research talks**[41] at conferences, workshops and seminars worldwide (Australia, Austria, Belgium, Brazil, Canada, Chile, China, Cuba, France, Germany, Greece, Hong Kong, Hungary, India, Japan, Mongolia, Morocco, Netherlands, Portugal, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, United Kingdom, Uruguay, USA). Out of these, **50+ are plenary talks** at conferences and workshops, **10+ are invited PhD courses and tutorials**, **60+ are seminar talks**, and the rest are invited and contributed conference talks. I regularly give talks at the premier international optimization conferences (each taking place once in 3 years): Int. Symposium on Mathematical Programming (Rio'06, Chicago'09, Berlin'12, Pittsburgh'15, Bordeaux'18), SIAM Conf. on Optimization (Darmstadt'11, San Diego'14, Vancouver'17, Hong Kong'20), Int. Conf. on Continuous Optimization (Ontario'07, Santiago'10, Lisbon'13, Tokyo'16, Berlin'19).

9.2 PLENARY TALKS[42]

09/2022	**CrossFL: Cross-Community Federated Learning: Algorithms, Systems and Co-designs**, workshop associated with the MLSys conference, Santa Clara, USA
06/2022	**Mathematics of Complex Data**, KTH Royal Institute of Technology, Stockholm, Sweden
05/2022	**Workshop on Stochastic Numerics, Statistical Learning, Optimization, Approximations, with Applications**, KAUST, Saudi Arabia
04/2022	**Lagrange Workshop on Federated Learning**, Lagrange Mathematics and Computing Research Center, virtual
04/2022	**Apple's Workshop on Privacy Preserving Machine Learning**, virtual
02/2022	**Dagstuhl Seminar**, Theory of Randomized Optimization Heuristics, 3 talks, Germany
12/2021	**NeurIPS 2021 Workshop. New Frontiers in Federated Learning: Privacy, Fairness, Robustness, Personalization and Data Ownership**, Virtual

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[41]All my talks are listed on https://www.maths.ed.ac.uk/~prichtar/i_talks.html

[42]For the purpose of this CV, a plenary talk is any talk not given to a sub-audience; or a talk explicitly labeled as a plenary/keynote talk by the organizers of the workshop/conference. I am excluding here talks at events I organized or co-organized and declined invites to deliver a plenary talk. I am including past talks, and accepted invites to give a talk.

11/2021	**KAUST-GSAI Joint Workshop on Advances in AI**, Virtual
11/2021	**Google Federated Learning and Analytics Workshop**, Virtual
07/2021	**Optimization Without Borders** (celebration of the 65th Birthday of Yurii Nesterov), Sirius University, Sochi, Russia
04/2021	**KAUST Conference on Artificial Intelligence**, 2 keynote talks, Thuwal, Saudi Arabia
08/2020	**Workshop on Privacy Preserving Machine Learning**, Apple, Virtual Workshop
07/2020	**ICML 2020 Workshop: Beyond First Order Methods in ML Systems**, Virtual
06/2020	**Mathematics of Data Science**, Virtual Conference, United Kingdom
10/2019	**School-Conference "Approximation and Data Analysis"**, Nizhny Novgorod, Russia
09/2019	**Workshop on Optimization, Statistics and Numerical Methods**, Moscow Institute of Physics and Technology, Dolgoprudny, Russia (workshop organized around my visit to MIPT)
09/2019	**50 Years of Mathematics in Bielefeld - the (new) Unity of Mathematics**, Bielefeld, Germany
09/2019	**DIMACS Workshop on Randomized Numerical Linear Algebra, Statistics, and Optimization,** Rutgers University, USA
06/2019	**Approximation, Sampling, and Compression in High Dimensional Problems**, Isaac Newton Institute for Mathematical Sciences Program on "Approximation, Sampling and Compression in Data Science", Cambridge University, UK
02/2019	**Numerical Algorithms in Nonsmooth Optimization**, Thematic Program: "Modern Maximal Monotone Operator Theory: From Nonsmooth Optimization to Differential Inclusions", Erwin Schrödinger International Institute for Mathematics and Physics (ESI), Vienna, Austria
11/2018	**Statistics and Data Science Workshop**, KAUST, Thuwal, KSA
09/2018	**Randomized Numerical Linear Algebra and Applications**, Program: Data Science, Simons Institute, Berkeley, USA
08/2018	**DIMACS/TRIPODS Workshop: Optimization in Machine Learning**, Lehigh University, Bethlehem, USA
07/2018	**XII Brazilian Workshop on Continuous Optimization**, Foz do Iguaçu, Brazil
10/2017	**Optimization at Work**[43], Moscow Institute of Physics and Technology, Moscow, Russia
09/2017	**Workshop on Decentralized Machine Learning, Optimization and Privacy**, Lille, France
07/2017	**Workshop on Convex Optimization and Applications**, Fields Institute, Toronto, Canada (in honour of 70th birthday of Arkadi Nemirovski)
04/2017	**Visual Computing - Modeling and Reconstruction**, KAUST, Thuwal, KSA
01/2017	**2017 BASP Frontiers Workshop**, Villars-sur-Ollon, Switzerland
11/2016	**Workshop on Distributed Machine Learning**, Telecom ParisTech, Paris, France
11/2016	**SIAM Warwick Student Chapter Conference on Machine Learning and Statistics,** Coventry, UK
10/2016	**41st Woudschoten Conference,** Zeist, Netherlands. Two keynote lectures in the stream "Numerical methods for big data analytics"
09/2016	**Linear Algebra and Parallel Computing at the Heart of Scientific Computing,** a joint event of the Royal Society of Edinburgh and the French Embassy in London, Edinburgh, UK
09/2016	**"OR58": The 58th Annual Conference of the Operational Research Society,** Portsmouth, UK (closing plenary)
06/2016	**2016 Int. Workshop on Modern Optimization and Applications (MOA 2016),** Beijing, China
04/2016	**Einstein Center Mathematical Colloquium "Sparsity: Statistics, Optimization, and Applications"**, Berlin, Germany. "The purpose of this biannual scientific colloquium is bringing together mathematicians, scientists, and engineers to enjoy a series of talks on one topical issue of current or emerging interest to several fields within mathematics."

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[43]This event was organized in my honour.

03/2016	**Computationally and Statistically Efficient Inference for Complex Large-scale Data**, Oberwolfach, Germany
09/2015	**Statistical and Computational Challenges in Large-Scale Data Analysis**, Alan Turing Institute Workshop, Cambridge, UK
09/2015	**LMS Inverse Day: Large-Scale and Nonlinear Inverse Problems**, Edinburgh, UK
04/2015	**Maxwell Institute Probability Day**, Edinburgh, UK
01/2015	**Optimization and Statistical Learning**, Les Houches, France
01/2015	**Theory of Big Data Science**, University College London, UK
12/2014	**Optimization Workshop, Foundations of Computational Mathematics**, Montevideo, Uruguay
11/2014	**46th Conference of Slovak Mathematicians**, Jasná, Slovakia
09/2014	**Mathematical Methods in Economics and Engineering**, Smolenice, Slovakia
07/2014	**Understanding Complex and Large Industrial Data**, Lancaster, UK
05/2014	**9th Int. Conf. on Intelligent Systems: Theories and Applications**, Rabat, Morocco
02/2014	**Stochastic Gradient Methods**, Inst. for Pure and Applied Mathematics, Los Angeles, USA
12/2013	**NeurIPS Workshop on Optimization in Machine Learning**, Lake Tahoe, USA. Past plenary speakers: D. Bertsekas, L. Bottou, S. Wright (2008), N. Srebro, L. Vandenberghe, A. Nemirovski (2009), M. Schmidt, Yu. Nesterov (2010), B. Recht, S. Boyd (2011), P. Parillo, F. Bach (2012)
11/2013	**International Conference on Information Technologies and Society**, Slovenia
10/2013	**Parallel and Distributed Algorithms for Inference and Optimization**, Simons Institute for the Theory of Computing, University of California, Berkeley, USA
05/2013	**Big Data Mining**, Imperial College London, UK
03/2013	**Fête Parisienne in Computation, Inference and Optimization**, IHES, Paris, France
03/2013	**Edinburgh SIAM Student Chapter Conference**, Edinburgh, UK
02/2013	**Big Data and Social Media**, Glasgow, UK
01/2013	**Optimization and Statistical Learning**, Les Houches, France
07/2012	**Optimization in Machine Learning**, ICML workshop, Edinburgh, UK
07/2011	**Optimization Workshop, Foundations of Comp. Mathematics**, Budapest, Hungary
05/2011	**Computational Complexity Challenges in Optimization**, Edinburgh, UK

9.3 INVITED LECTURE SERIES, TUTORIALS & SUMMER SCHOOL COURSES

06/2022	**Introduction to Stochastic Gradient Descent Methods** (PhD course, 22.5 hours), School of Mathematics, Physics and Informatics, Bratislava, Slovakia
06/2022	**Introduction to Stochastic Gradient Descent Methods** (PhD course, 18 hours), Vienna Graduate School for Computational Optimization (VGSCO), Vienna, Austria
10/2019	**A Guided Walk Through the ZOO of Stochastic Gradient Descent Methods** (Mini-course, 2.5 hours), School-Conference "Approximation and Data Analysis", Nizhny Novgorod, Russia
09/2019	**A Guided Walk Through the ZOO of Stochastic Gradient Descent Methods** (Mini-course, 5 hours), Moscow Institue of Physics and Technology, Dolgoprudny, Russia
08/2019	**A Guided Walk Through the ZOO of Stochastic Gradient Descent Methods** (Summer School Lectures, 6 hours), International Conference on Continuous Optimization (ICCOPT 2019), Berlin, Germany
02/2019	**Randomized Optimization Methods** (PhD Course, 4.5 hours), Erwin Schrödinger International Institute for Mathematics and Physics (ESI), Vienna, Austria
06/2018	**Stochastic Reformulations in Linear Algebra and Optimization** (Summer School, 2 hours), Control, Information and Optimization, Voronovo, Moscow Region, Russia
04/2018	**Introduction to Optimization for Machine Learning** (short outreach course for selected Saudi university students who previously participated in the Saudi National Mathematical Olympiad or IMO, 4.5 hours), KAUST, Thuwal, KSA

08/2017	**Randomized Optimization Methods** (Summer School, 5 hours), Data Science Summer School (DS^3), École Polytechnique, France. Other courses: Joshua Bengio (Montreal), Deep Learning; Pradeep Ravikumar (CMU), Graphical Models; Csaba Szepesvári (Alberta/Google DeepMind), Bandits
10/2015	**Randomized Methods for Big Data: From Linear Systems to Optimization** (Tutorial), IEEE International Conference on Data Science and Advanced Analytics, Paris, France
2015	**Randomized Algorithms for Big Data Optimization** (PhD Course, 18 hours), Graduate School in Systems, Optimization, Control and Networks – Université catholique de Louvain, Belgium
09/2015	**Optimization in Machine Learning** (PhD Course, 8 hours), Machine Learning Thematic Trimester, Toulouse, France
07/2015	**Modern Convex Optimization Methods for Large-Scale Empirical Risk Minimization** (Tutorial, 2 hours, joint with M. Schmidt), ICML 2015, Lille, France
06/2014	**Randomized Coordinate Descent Methods** (PhD Course, 6 hours), Khronos-Persyval Days "High-Dimensional Learning and Optimization", Grenoble, France
06/2014	**Coordinate Descent Methods** (Lecture, 2 hours), NATCOR PhD Course on Convex Optimization, Edinburgh, UK
02/2014	**Gradient Methods for Big Data** (Tutorial, 3 hours), Big Data: Challenges and Applications, Imperial College London, UK

9.4 TALKS @ RESEARCH SEMINARS

2022	Machine Learning NeEDS Mathematical Optimization (virtual), Federated Learning One World Seminar (virtual), KAUST (2), Better AI Meetup
2021	University of Tartu (virtual), Portsmouth (virtual), Kempelen Institute for Intelligent Technologies, Comenius University, MBZUAI (virtual), All Russian Seminar on Optimization (virtual), Federated Learning One World Seminar (virtual; 2), KAUST (3)
2020	ESET, Optimization One World Seminar, Montréal MLOpt Seminar
2019	Huawei
2018	Bratislava, KAUST (2), Warwick, Edinburgh (2)
2017	Imperial College London, KAUST, Plymouth, Cardiff
2016	Cambridge, Edinburgh (3), Stanford (2), KAUST, The Alan Turing Institute, LSE, Southampton, Skoltech, Yandex
2015	Louvain, Oxford, IST Austria, UC Davis, UC Berkeley, Edinburgh
2014	Moscow, Paris, Hong Kong, Edinburgh (3)
2013	UC Berkeley, Google, SAS Inc, Louvain, Edinburgh
2012	Wisconsin, Cambridge, Glasgow, Cardiff, Bratislava
2011	Edinburgh, Oxford, London, Heriot-Watt, Louvain
2010	Birmingham, Nottingham, Southampton
2009	ETH Zürich, Linz, Louvain, Edinburgh (2)
2008	Liége, Bratislava
2007	Cornell (2), Louvain (2)

10. TEACHING[44]

KAUST	Spring 2022	Federated Learning* (CS 332)
	Fall 2021	Stochastic Gradient Descent Methods* (CS 331)
	Spring 2021	Federated Learning* (CS 332)
	Fall 2020	Stochastic Gradient Descent Methods* (CS 331)
	Spring 2020	Federated Learning* (CS 390T)

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[44]I have proposed and developed from scratch courses marked with an asterisk. I was the instructor for all courses marked in bold. I was a TA (teaching assistant / tutor) for all other courses.

	Spring 2019	Contemporary Topics in Machine Learning* (CS 394D)
	Spring 2018	Contemporary Topics in Machine Learning* (CS 394D)
	Fall 2019	Big Data Optimization* (CS 390FF)
	Fall 2018	Big Data Optimization* (CS 390FF)
	Fall 2017	Big Data Optimization* (CS 390FF)
Edinburgh	Spring 2017	Modern Optimization Methods for Big Data Problems*
	Spring 2016	Modern Optimization Methods for Big Data Problems*
	Fall 2012	Discrete Programming and Game Theory*
	Fall 2011	Discrete Programming and Game Theory*
	Fall 2011	Discrete Programming and Game Theory*
	Spring 2015	Optimization Methods in Finance*
	Spring 2014	Optimization Methods in Finance*
	Spring 2013	Optimization Methods in Finance*
	Spring 2012	Optimization Methods in Finance*
	Spring 2011	Optimization Methods in Finance*
	Fall 2012	Game Theory*
	Fall 2011	Game Theory*
	Fall 2010	Game Theory*
	Spring 2013	Computing and Numerics
	Fall 2010	Dynamic & Integer Programming
	Fall 2010	Mathematics for Chemical Engineers
Louvain	Spring 2009	Nonlinear Optimization (with Yu. Nesterov)
Cornell	Spring 2006	Optimization II/Nonlinear Optimization
	Summer 2005	Engineering Probability and Statistics*
	Fall 2003	Engineering Probability and Statistics
	Summer 2003	Engineering Probability and Statistics
	Spring 2004	Optimization II
	Spring 2005	Application of Game Theory and OR to IT
	Spring 2005	Topics in Linear Optimization
	Fall 2006	Combinatorial Optimization (PhD course taught by David Williamson)
Comenius	Fall 1998	Complex Analysis

11. CONFERENCE, STREAM, WORKSHOP & SEMINAR ORGANIZATION[45]

03/2022	Rising Stars in AI Symposium, KAUST, Thuwal, Saudi Arabia
05/2021	**SIAM Conference on Optimization**, Virtual (member of the organizing committee)
06/2020–now	**Federated Learning One World Seminar (FLOW)**[46] (founder and chair of the organizing committee)
11/2019	KAUST-Tsinghua-Industry Workshop on Advances in Artificial Intelligence, KAUST, Thuwal, Saudi Arabia
06/2019	Sparse Approximation and Sampling, The Alan Turing Institute, London
04/2019	A Short Course on Deep Learning and the Latest AI Algorithms, KAUST, Saudi Arabia. A 2-day course delivered by Xavier Bresson, NTU, Singapore
07/2018	International Symposium on Mathematical Programming, Bordeaux, France. Scientific Committee Member for stream 4a: "Machine Learning, Big Data, Cloud Computing, and Huge-Scale Optimization" (with A. d'Aspremont, O. Beaumont and S. Sra)
02/2018	Optimization and Big Data 2018, KAUST (co-organizer with M. Canini)
2017–now	All Hands Meetings on Big Data Optimization, KAUST (a weekly group research seminar)
09/2016	IMA Numerical Linear Algebra and Optimization, Birmingham, UK (co-organizing 2 minisymposia)

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[45]I am excluding organized conference sessions.

[46]https://sites.google.com/view/one-world-seminar-series-flow/home

12/2015	Mathematical Perspectives on Big Data, a joint meeting of the London and Edinburgh mathematical societies, celebrating 150th anniversary of the former, Edinburgh
12/2015	Theoretical and Computational Approaches to Large-Scale Inverse Problems, Edinburgh (Alan Turing Institute Scoping Workshop)
11/2015	Distributed Machine Learning and Optimization, Edinburgh (Alan Turing Institute Scoping Workshop)
05/2015	Optimization and Big Data 2015, Edinburgh (founder and co-organizer; with Z. Qu)
01/2015	International BASP Frontiers Workshop 2015, Villars-sur-Ollon, Switzerland
12/2014	Workshop: Numerical Algorithms and Intelligent Software, Edinburgh
09/2014	2 minisymposia at 4th IMA Conf. on Numerical Lin. Alg. and Optimisation, Birmingham
05/2014	Coordinate Descent Methods Symposium at the SIAM Conference on Optimization, San Diego (24 speakers)
2014–2017	All Hands Meetings on Big Data Optimization, University of Edinburgh (a weekly interdisciplinary research seminar attended by faculty, postdocs and PhD students from the Schools of Mathematics, Engineering and Informatics and Heriot-Watt University)
07/2013	Cluster Co-Chair, "Convex and Nonsmooth Optimization" at the International Conference on Continuous Optimization (ICCOPT), Lisbon, Portugal (with F. Glineur). We organized 23 invited sessions in the cluster (=70 speakers). ICCOPT is the premiere conference in continuous optimization, taking place once in 3 years. Our cluster was twice as large as the second largest cluster.
05/2013	Optimization and Big Data 2013, Edinburgh, 64 participants (founder and organizer)
05/2012	Optimization and Big Data 2012, Edinburgh, 62 participants (founder and organizer)
07/2011	2 minisymposia at 3rd IMA Conf. on Numerical Linear Algebra and Optimisation, Birmingham
07/2011	2 minisymposia at 24th Biennial Conf. on Numerical Analysis, Glasgow

12. COMMISSIONS OF TRUST

12.1 EXTERNAL ACTIVITIES

2022–now	**Action Editor**, Transactions on Machine Learning Research
2022	**Guest Editor**, JOTA Special Issue on "Optimization for Distributed and Federated Learning" (co-editors: Suvrit Sra and Wotao Yin)
2022	**Area Chair**, NeurIPS
2022	**Area Chair**, ICML
2022	**Area Chair**, ICLR
2021	Habilitation[47] Committee Member for Dr. Aurélien Bellet, Inria Lille - Nord Europe, France (other committee members: Francis Bach, Kamalika Chaudhuri and Catuscia Palamidessi)
2021	**Area Chair**, NeurIPS, virtual
2021	**Area Chair**, ICML, virtual
2021–now	**Area Editor**[48], Journal of Optimization Theory and Applications
2021	Reviewer of Hi!Paris Fellowship applications in machine learning[49]
2021	Associate Editor (declined invite), Journal of Artificial Intelligence and Machine Learning
2021–now	Research Mentor, Kempelen Institute of Intelligent Technologies, Bratislava, Slovakia
2021	**Senior Program Committee Member**, IJCAI, Montréal, Canada
2021	**Area Chair**, ICLR, Vienna, Austria
2020	External PhD Examiner for Axel Böhm, University of Vienna (advisor: Radu Ioan Bot)
2020	External PhD Examiner for Dmitry Grishchenko, Université Grenoble Alpes (advisors: Franck Iutzeler, Jérome Malick, and Massih-Reza Amini)

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[47]Habilitation á diriger des recherches

[48]area: Optimization for Machine Learning

[49]Hi!Paris is a new interdisciplinary center for research and education on AI and Data Analytics for Science, Business and Society launched by HEC Paris and Institut polytechnique de Paris (IP Paris). See www.hi-paris.fr

2020	**Area Chair**, NeurIPS, Vancouver, Canada
2020	**Expert Reviewer**, ICML, Vienna, Austria
2020	Program Committee Member, ICML International Workshop on Federated Learning for User Privacy and Data Confidentiality
2020	Evaluator & Reviewer, European Commission H2020 grants
2020	Evaluator & Reviewer, European Commission ICT grants totaling 40+ million EUR
2020	Program Committee Member, International Workshop on Federated Learning for User Privacy and Data Confidentiality (IJCAI-PRICAI[50]), Yokohama, Japan
2020	**Senior Program Committee Member**, IJCAI-PRICAI, Yokohama, Japan
2019	Program Committee Member, NeurIPS, Vancouver, Canada
2019	Program Committee Member, AISTATS, Naha, Okinawa, Japan
2019	External PhD Examiner for Benjamin Dubois, École des Ponts, France (advisor: G. Obozinski)
2019–now	**Handling Editor**, Journal of Nonsmooth Analysis and Optimization
2019	**Senior Program Committee Member**, IJCAI, Macao, China
2019	**Area Chair**, ICML, Long Beach, California
2018–now	**Associate Editor**, Optimization Methods and Software
2018	Reviewer, Carnegie Trust, UK
2018	Program Committee Member, NeurIPS, Montreal, Canada
2018	Program Committee Member, ICML, Stockholm, Sweden
2018	Program Committee Member, ICLR, Vancouver, Canada
2017	Program Committee Member, NeurIPS, Long Beach, USA
2017	Program Committee Member, AAAI, New Orleans, USA
2017	Reviewer, ERC (European Research Council) Consolidator Grants
2016	Habilitation Examiner for Nicolas Couellan, Institut de Mathématiques de Toulouse, Université Paul Sabatier, France (other examiners: Jean-Baptiste Hiriart-Urruty (Toulouse))
2016	External PhD Examiner for Igor Colin, Télécom ParisTech, France (other examiners: Alexandre D'Aspremont (ENS) and Mikael Johansson (KTH))
2016	**Guest Editor**, Journal of Computational Mathematics (co-editors: Xiaojun Chen, Yuhong Dai, and Yinyu Ye)
2016	Reviewer, EPSRC Programme Grant Scheme
2016	External PhD Examiner for Hamid Reza Feyzmahdavian, Automatic Control Department, KTH Royal Institute of Technology, Sweden
2016	Program Committee Member, Symposium on Distributed Information Processing, Optimization, and Resource Management over Networks, IEEE Global Conference on Signal and Information Processing, Greater Washington, D.C., USA
2016	Program Committee Member, NeurIPS, Barcelona, Spain
2016	Program Committee Member, ICML, New York, USA
2016	Program Committee Member, International Conference on Internet of Things and Big Data, Rome, Italy
2015	Program Committee Member, AISTATS, San Diego, California
2015	Program Committee Member, 13th EUROPT Workshop on Advances in Continuous Optimization, Edinburgh
2015	Program Committee Member, ICML, Lille, France
2015	External DPhil Examiner for Sheng Fang, Mathematical Institute, University of Oxford, UK (internal examiner: Jared Tanner)
2015	Lead, Alan Turing Institute PhD Programme in Data Science (responsible, on behalf of the University of Edinburgh, for the development of the PhD programme, starting in 2017)
2015	Evaluator & Reviewer, EU Horizon 2020 grants totaling 36.2 million EUR
2015	Reviewer for Leverhulme Trust (2×)
2015	Reviewer for Isaac Newton Trust
2014–2020	**Associate Editor**, Optimization (Frontiers in Applied Mathematics and Statistics)

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[50]International Joint Conference on Artificial Intelligence – Pacific Rim International Conference on Artificial Intelligence

2014–2017	Steering Committee (representing School of Mathematics), Centre for Doctoral Training in Data Science, University of Edinburgh (£5.03m grant from EPSRC)
2013–2017	Member, EPSRC Peer Review College
2013	Evaluator & Reviewer, EU FP7 grants totaling 42.5 million EUR.
2013	Chief Editor (declined invite), Statistics, Optimization and Computing (SOIC)
2012–2014	Steering Committee (representing University of Edinburgh), Numerical Algorithms and Intelligent Software (£5m grant from EPSRC)
2011–2017	Reviewer, EPSRC
2011–2016	Faculty Advisor, SIAM Edinburgh Student Chapter

12.2 JOURNAL REVIEWING

Mathematical Programming, SIAM Journal on Optimization, SIAM Review, Foundations of Computational Mathematics, Journal of Machine Learning Research, Machine Learning, IEEE Signal Processing, Symposium on Theory of Computing, Computational Optimization and Applications, Optimization Methods and Software, SIAM Journal on Computing, European Journal of Operational Research, Central European Journal of Operational Research, Journal of Global Optimization.

12.4 SERVICE @ KAUST

2022	MS Thesis Examiner for Fernando Zhapa Camacho, Computer Science
2021–now	**Member, AI Initiative Advisory Board**
2021	PhD Proposal Examiner for Han Shao, Computer Science
2020–2021	**Chair, Machine Learning Faculty Search Committee**
2020	PhD Thesis Examiner for Adel Bibi, Computer Science (other examiners: Yi Ma (Berkeley), Wolfgang Heidrich (KAUST), Bernard Ghanem (KAUST))
2019–2021	**Member, AI Initiative Committee**
2019–2021	Faculty Sponsor, KAUST ACM Student Chapter
2019–2020	**Chair, Machine Learning Faculty Search Committee**
2019	PhD Proposal Examiner for Adel Bibi, Computer Science
2019	Member, Research Strategic Plan Working Group (representing CEMSE)
2018–2019	**Chair, Artificial Intelligence Committee**[51]
2018–now	**Co-Founder, The Machine Learning Hub** (with M. Canini, B. Ghanem and P. Kalnis)
2018–2019	CS Program Curriculum Committee Member
2018	CS Faculty Search Committee Member, Machine Learning
2017	PhD Proposal Examiner for Khalil Elkhalil, Electrical Engineering
2017–2019	Elected Member of the Academic Council
2017–2018	Faculty Search Committee, Statistics and Computer Science
2017	Directed Research Project Evaluation Panel

12.5 SERVICE @ EDINBURGH

2016	Recruitment Panel, Chancellor's Fellowships in "Mathematics of Data Science" and "Industrial Mathematics"
2016	Internal PhD Examiner for Zhanxing Zhu, School of Informatics, University of Edinburgh (external examiner: Manfred Opper (TU Berlin)
2015	PhD Admissions, Data Science
2015	Recruitment Panel, Lectureship in "Mathematics of Data Science"

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[51]I led a university-wide committee tasked by the President of KAUST to prepare a document mapping current AI activity at KAUST and suggesting a plan for building the AI initiative at KAUST in the next 5 years; we have written a 100+ page report.

2014–2015	Part of a small team at Edinburgh assisting with a bid for **The Alan Turing Institute (UK National Data Science and AI Institute)** and subsequently with organizational planning. The bid was successful and University of Edinburgh became one of 5 founding institutions of the Alan Turing Institute (with Oxford, Cambridge, UCL and Warwick).
2013–2016	PhD Admissions, OR & Optimization
2009–2015	Director of Studies and Personal Tutor
2009–2015	MSc Projects Coordinator, OR and Optimization Programme

13. PROFESSIONAL AFFILIATIONS

Association for Computing Machinery (ACM)
Society for Industrial and Applied Mathematics (SIAM)
Mathematical Optimization Society (MOS)
Edinburgh Mathematical Society (EMS)
Isaac Newton Institute for Mathematical Sciences (INIMS)
Institute for Operations Research and Management Science (INFORMS)
Foundations of Computational Mathematics (FoCM)
Slovak Mathematical Society (SMS)

14. INDUSTRY INVOLVEMENT

14.1 INDUSTRY INVOLVEMENT: SUMMARY

company	paper(s)	comment
Intel	[93]	+ ongoing collaboration
Microsoft Research	[79]	+ ongoing collaboration
IBM Research	[22, 78]	+ ongoing collaboration
Samsung AI		ongoing collaboration
Facebook	[83]	+ ongoing collaboration
Amazon	[49, 133]	+ ongoing collaboration through my students F. Hanzely, S. Horváth and K. Mishchenko who have held research internships at Amazon in Berlin and Seattle.
Google	[51, 52]	co-development of Federated Learning
Huawei		currently preparing a grant proposal to collaborate in the area of Federated Learning
Baidu	[29]	
Western General Hospital	[11]	

In the past I have had research discussions with SAS, Twitter, Arup, British Geological Survey, Confbuzz and Scottish Financial Risk Academy.

14.2 INDUSTRY INVOLVEMENT: FEDERATED LEARNING (with Google)

Standard machine learning approaches require centralizing the training data on one machine or in a datacenter. For models trained from user interaction with mobile devices, a new approach was just released by Google, a result of collaboration between Google, Jakub Konečný and myself. The new approach is called "Federated Learning"; it is described in my papers [51, 52] and two additional papers by Google.

Federated Learning enables mobile phones to collaboratively learn a shared prediction model while keeping all the training data on device, decoupling the ability to do machine learning from the need to store the data in the cloud. This goes beyond the use of local models that make predictions on mobile devices by bringing model training to the device as well. **The technology is now in use by around 1 billion Android devices.**

The CEO of Google, Sundar Pichai, said:

> "...we continue to set the pace in machine learning and AI research. We introduced a new technique for training deep neural networks on mobile devices called Federated Learning. This technique enables people to run a shared machine learning model, while keeping the underlying data stored locally on mobile phones."

The new technology is described in a Google Research Blog, dated April 2017, to a lay audience. Selected media coverage: Forbes, The Verge, Quartz, TechRepublic, ZDNet, Computer Business Review, Motherboard Vice, Infoworld, Venturebeat, Engadget, Tech Narratives, GadgetHacks, BGR, AndroidAuthority, AndroidHeadlines, Tom's Guide, Digital Trends, The Exponential View, 9to5google.

14.3. INDUSTRY INVOLVEMENT: YOUTUBE (with Google)

An excerpt from a support letter written to me by David J Harper, the Head of EMEA University Relations, Google Switzerland, for the purpose of a (successful) grant application:

> "Google recognizes the contributions of Dr Richtárik's research to the field of big data optimization. We have invited him to deliver a talk on his research on parallel and distributed coordinate descent methods in our internal Machine Learning seminar. The talk took place in Mountain View, California, in September 2013 and was televised via our teleconference facilities to Google offices around the globe. A variant of the algorithm[52] developed by Dr. Richtárik is in operation at Google in the YouTube recommendation engine."

15. PUBLICATIONS

15.1 CITATION METRICS[53]

According to Google Scholar, my works attracted more than 12,000 citations, my `h-index` is 50, and my `i10-index` (number of papers with at least 10 citations) is 129.

15.2 CONFERENCE ABBREVIATIONS

NeurIPS	Annual Conference on Neural Information Processing Systems
	(a leading conference in machine learning and artificial intelligence research)
ICML	International Conference on Machine Learning
	(a leading conference in machine learning and artificial intelligence research)
ICLR	International Conference on Learning Representations
	(a leading conference in machine learning and artificial intelligence research)
AISTATS	International Conference on Artificial Intelligence and Statistics
ALT	International Conference on Algorithmic Learning Theory
AAAI	Conference on Artificial Intelligence
UAI	Uncertainty in Artificial Intelligence
ECML PKDD	European Conf. on Machine Learning and Principles & Practice of Knowledge Discovery in Databases
ICCV	IEEE International Conference on Computer Vision
VMV	Vision, Modeling and Visualization
MLSP	IEEE International Workshop on Machine Learning for Signal Processing
PROMS	Springer Proceedings in Mathematics & Statistics
ICASSP	International Conference on Acoustics, Speech, and Signal Processing
	(world's largest and most comprehensive technical conference focused on signal processing and its applications)
GlobalSIP	IEEE Global Conference on Signal and Information Processing
Allerton	Annual Allerton Conference on Communication, Control, and Computing

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[52]A variant of the method developed in [18, 24].
[53]These citations metric were extracted via Google Scholar in March 2022.

SPARS	Proceedings of Signal Processing with Adaptive Sparse Structured Representations
WACV	IEEE Winter Conference on Applications in Computer Vision
SPIE	Proceedings of the Society of Photo-Optical Instrumentation Engineers
OR	Operations Research Proceedings
SIGCOMM	ACM's Special Interest Group on Data Communications, specializing in the field of communication and computer networks
SOSP	Workshop on AI Systems at Symposium on Operating Systems Principles
NSDI	USENIX Symposium on Networked Systems Design and Implementation

15.3 LIST OF PUBLICATIONS, PREPRINTS & TECHNICAL REPORTS

The papers are listed in reverse chronological order in terms of their appearance online. The `arXiv` identifier is mentioned for papers which are not yet published. Coauthors marked with (r), (p), (d), (m) and (i) were my (r)esearch scientists, (p)ostdocs, (d)octoral students, (m)aster students and (i)nterns at the time of writing, respectively.

(186) K. Mishchenko[d], G. Malinovsky[d], S. Stich and P. Richtárik
ProxSkip: Yes! Local gradient steps provably lead to communication acceleration! Finally!
`arXiv:2202.09357`
Federated learning paper

(185) D. Kovalev[d], A. Beznosikov, A. Sadiev, M. Persiianov, P. Richtárik and A. Gasnikov
Optimal algorithms for decentralized stochastic variational inequalities
`arXiv:2202.02771`

(184) A. Tyurin[p] and P. Richtárik
Distributed nonconvex optimization with communication compression, optimal oracle complexity, and no client synchronization
`arXiv:2202.01268`
Federated learning paper

(183) P. Richtárik, I. Sokolov[m], I. Fatkhullin[i], E. Gasanov[d], Z. Li[r] and E. Gorbunov
3PC: Three point compressors for communication-efficient distributed training and a better theory for lazy aggregation
`arXiv:2202.00998`
Federated learning paper

(182) H. Zhao, B. Li, Z. Li[r], P. Richtárik and Y. Chi
BEER: Fast $O(1/T)$ rate for decentralized nonconvex optimization with communication compression
`arXiv:2201.13320`
Federated learning paper

(181) G. Malinovsky[d], K. Mishchenko[d] and P. Richtárik
Server-side stepsizes and sampling without replacement provably help in federated optimization
`arXiv:2201.11066`
Federated learning paper

Prepared in 2021

(180) D. Kovalev[d], A. Gasnikov and P. Richtárik
Accelerated primal-dual gradient method for smooth and convex-concave saddle-point problems with bilinear coupling
`arXiv:2112.15199`

(179) H. Zhao, K. Burlachenko[d], Z. Li[r] and Peter Richtárik
Faster rates for compressed federated learning with client-variance reduction
`arXiv:2112.13097`
Federated learning paper

(178) K. Burlachenko[d], S. Horváth[d] and P. Richtárik
FL-PyTorch: Optimization research simulator for federated learning
The 2nd International Workshop on Distributed Machine Learning, 2021
Federated learning paper

(177) E. Gasanov[d], A. Khaled, S. Horváth and P. Richtárik
FLIX: A simple and communication-efficient alternative to local methods in federated learning
AISTATS 2022
Federated learning paper

(176) X. Qian[p], R. Islamov[i], M. Safaryan[p] and P. Richtárik
Basis matters: better communication-efficient second order methods for federated learning
AISTATS 2022
Federated learning paper

(175) A. Beznosikov, P. Richtárik, M. Diskin, M. Ryabinin and A. Gasnikov
Distributed methods with compressed communication for solving variational inequalities, with theoretical guarantees
`arXiv:2110.03313`

(174) Rafał Szlendak[d], A. Tyurin[p] and P. Richtárik
Permutation compressors for provably faster distributed nonconvex optimization
ICLR 2022
Federated learning paper

(173) I. Fatkhullin[i], I. Sokolov[d], E. Gorbunov[d], Z. Li[p] and P. Richtárik
EF21 with bells & whistles: practical algorithmic extensions of modern error feedback
`arXiv:2110.03294`
Federated learning paper

(172) X. Qian[p], H. Dong, P. Richtárik and T. Zhang
Error compensated loopless SVRG, Quartz, and SDCA for distributed optimization
`arXiv:2109.10049`
Federated learning paper

(171) M. Jahani, S. Rusakov, Z. Shi, P. Richtárik, M. W. Mahoney and M. Takáč
Doubly adaptive scaled algorithm for machine learning using second-order information
ICLR 2022

(170) H. Zhao, Z. Li[r] and P. Richtárik
FedPAGE: A fast local method for federated learning
`arXiv:2108.04755`
Federated learning paper

(169) Z. Li[r] and P. Richtárik
CANITA: Faster rates for distributed convex optimization with communication compression
`arXiv:2107.09461`
Federated learning paper

(168) 50+ authors
A field guide to federated optimization
`arXiv:2107.06917`
Federated learning paper

(167) P. Richtárik, I. Sokolov[m], and I. Fatkhullin[i]
EF21: A new, simpler, theoretically better, and practically faster error feedback
NeurIPS 2021
NeurIPS 2021 oral paper (less than 1% acceptance rate)
Federated learning paper

(166) D. Kovalev[d], E. Gasanov[d], P. Richtárik, and A. Gasnikov
Lower bounds and optimal algorithms for smooth and strongly convex decentralized optimization over time-varying networks
`arXiv:2106.04469`
Federated learning paper

(165) B. Wang[i], M. Safaryan[p], and P. Richtárik
Smoothness-aware quantization techniques
`arXiv:2106.03524`
Federated learning paper

(164) A. Salim[p], L. Sun[d], and P. Richtárik
Complexity analysis of Stein variational gradient descent under Talagrand's inequality T1
`arXiv:2106.03076`

(163) L. Condat[r] and P. Richtárik
MURANA: A generic framework for stochastic variance-reduced optimization
`arXiv:2106.03056`
Federated learning paper

(162) M. Safaryan[p], R. Islamov[i], X. Qian[p], and P. Richtárik
FedNL: Making Newton-type methods applicable to federated learning
`arXiv:2106.02969`
Federated learning paper

(161) G. Malinovsky[m], A. Sailanbayev[d], and P. Richtárik
Random reshuffling with variance reduction: new analysis and better rates
`arXiv:2104.09342`

(160) Z. Li$^{(r)}$and P. Richtárik
ZeroSARAH: Efficient nonconvex finite-sum optimization with zero full gradient computations
`arXiv:2103.01447`
Federated learning paper

(159) A. Salim$^{(p)}$, L. Condat$^{(r)}$, D. Kovalev$^{(d)}$, and P. Richtárik
An optimal algorithm for strongly convex minimization under affine constraints
`arXiv:2102.11079`

(158) Z. Shi, N. Loizou, P. Richtárik, and M. Takáč
AI-SARAH: Adaptive and implicit stochastic recursive gradient methods
`arXiv:2102.09700`

(157) D. Kovalev$^{(d)}$, E. Shulgin$^{(m)}$, P. Richtárik, A. Rogozin$^{(i)}$, and A. Gasnikov
ADOM: Accelerated decentralized optimization method for time-varying networks
ICML 2021
Federated learning paper

(156) K. Mishchenko$^{(d)}$, B. Wang$^{(i)}$, D. Kovalev$^{(d)}$, and P. Richtárik
IntSGD: Floatless compression of stochastic gradients
ICLR 2022
ICLR 2022 Spotlight paper
Federated learning paper

(155) M. Gorbunov$^{(i)}$, K. Burlachenko$^{(d)}$, Z. Li$^{(r)}$, and P. Richtárik
MARINA: faster non-convex distributed learning with compression
To appear in: *ICML 2021*
`arXiv:2102.07845`
Federated learning paper

(154) M. Safaryan$^{(p)}$, F. Hanzely$^{(d)}$, and P. Richtárik
Smoothness matrices beat smoothness constants: better communication compression techniques for distributed optimization
`arXiv:2102.07245`
Federated learning paper

(153) K. Islamov$^{(i)}$, X. Qian$^{(p)}$, and P. Richtárik
Distributed second order methods with fast rates and compressed communication
To appear in: *ICML 2021*
`arXiv:2102.07158`
Federated learning paper

(152) K. Mishchenko$^{(d)}$, A. Khaled$^{(i)}$, and P. Richtárik
Proximal and federated random reshuffling
`arXiv:2102.06704`
Federated learning paper

Prepared in 2020

(151) S. Horváth$^{(d)}$, A. Klein, P. Richtárik, and C. Archambeau
Hyperparameter transfer learning with adaptive complexity

AISTATS 2021

(150) X. Qian$^{(p)}$, H. Dong, P. Richtárik, and T. Zhang
Error compensated loopless SVRG for distributed optimization
OPT2020: 12th Annual Workshop on Optimization for Machine Learning (NeurIPS 2020 Workshop)
Federated learning paper

(149) X. Qian$^{(p)}$, H. Dong, P. Richtárik, and T. Zhang
Error compensated proximal SGD and RDA
OPT2020: 12th Annual Workshop on Optimization for Machine Learning (NeurIPS 2020 Workshop)
Federated learning paper

(148) E. Gorbunov$^{(i)}$, F. Hanzely$^{(d)}$, and P. Richtárik
Local SGD: unified theory and new efficient methods
AISTATS 2021
Federated learning paper

(147) D. Kovalev$^{(d)}$, A. Koloskova, M. Jaggi, P. Richtárik, and S. U. Stich
A linearly convergent algorithm for decentralized optimization: sending less bits for free!
AISTATS 2021
Federated learning paper

(146) W. Chen$^{(i)}$, S. Horváth$^{(d)}$, and P. Richtárik
Optimal client sampling for federated learning
Privacy Preserving Machine Learning (NeurIPS 2020 Workshop)
Federated learning paper

(145) E. Gorbunov$^{(i)}$, D. Kovalev$^{(d)}$, D. Makarenko, and P. Richtárik
Linearly converging error compensated SGD
`arXiv:2010.12292`
Federated learning paper

(144) A. Albasyoni$^{(m)}$, M. Safaryan$^{(p)}$, L. Condat$^{(r)}$, and P. Richtárik
Optimal gradient compression for distributed and federated learning
`arXiv:2010.03246`
Federated learning paper

(143) F. Hanzely$^{(d)}$, S. Hanzely$^{(m)}$, S. Horváth$^{(d)}$, and P. Richtárik
Lower bounds and optimal algorithms for personalized federated learning
NeurIPS 2020
Federated learning paper

(142) L. Condat$^{(r)}$, G. Malinovsky$^{(m)}$, and P. Richtárik
Distributed proximal splitting algorithms with rates and acceleration
`arXiv:2010.00952`

(141) R. M. Gower, M. Schmidt, F. Bach, and P. Richtárik
Variance-reduced methods for machine learning
Proceedings of the IEEE 108(11):1968–1983, 2020

(140) X. Qian(p), P. Richtárik, and T. Zhang
Error compensated distributed SGD can be accelerated
`arXiv:2010.00091`
Federated learning paper

(139) A. S. Berahas, M. Jahani, P. Richtárik, and M. Takáč
Quasi-Newton methods for deep learning: forget the past, just sample
Optimization Methods and Software, 2021

(138) Z. Li(p), H. Bao, X. Zhang, and P. Richtárik
PAGE: A simple and optimal probabilistic gradient estimator for nonconvex optimization
ICML 2021

(137) D. Kovalev(d), A. Salim(p), and P. Richtárik
Optimal and practical algorithms for smooth and strongly convex decentralized optimization
NeurIPS 2020

(136) Ahmed Khaled(i), Othmane Sebbouh(i), Nicolas Loizou, Robert M. Gower, and P. Richtárik
Unified analysis of stochastic gradient methods for composite convex and smooth optimization
`arXiv:2006.11573`

(135) S. Horváth(d) and P. Richtárik
A better alternative to error feedback for communication-efficient distributed learning
ICLR 2021
The Best Paper Award at the NeurIPS 2020 Workshop on Scalability, Privacy, and Security in Federated Learning
Federated learning paper

(134) A. Salim(p) and P. Richtárik
Primal dual interpretation of the proximal stochastic gradient Langevin algorithm
NeurIPS 2020

(133) Z. Li(p) and P. Richtárik
A unified analysis of stochastic gradient methods for nonconvex federated optimization
`arXiv:2006.07013`
Federated learning paper

(132) K. Mishchenko(d), A. Khaled(i), and P. Richtárik
Random reshuffling: simple analysis with vast improvements
NeurIPS 2020

(131) M. Alfarra(m), S. Hanzely(m), A. Albasyoni(m), B. Ghanem, and P. Richtárik
Adaptive learning of the optimal mini-batch size of SGD
`arXiv:2005.01097`

(130) A. Salim(p), L. Condat(r), K. Mishchenko(d), and P. Richtárik
Dualize, split, randomize: fast nonsmooth optimization algorithms
`arXiv:2004.02635`

(129) A. N. Sahu[i], A. Dutta[p], A. Tiwari[i], and P. Richtárik
On the convergence analysis of asynchronous SGD for solving consistent linear systems
`arXiv:2004.02163`

(128) G. Malinovsky[i], D. Kovalev[d], E. Gasanov[d], L. Condat[r], and P. Richtárik
From local SGD to local fixed point methods for federated learning
ICML 2020
Federated learning paper

(127) A. Beznosikov[i], S. Horváth[d], P. Richtárik and M. Safaryan[p]
On biased compression for distributed learning
`arXiv:2002.12410`
Federated learning paper

(126) Z. Li[p], D. Kovalev[d], X. Qian[p]and P. Richtárik
Acceleration for compressed gradient descent in distributed and federated optimization
ICML 2020
Federated learning paper

(125) D. Kovalev[d], R. M. Gower, P. Richtárik and A. Rogozin[i]
Fast linear convergence of randomized BFGS
`arXiv:2002.11337`

(124) F. Hanzely[d], N. Doikov, P. Richtárik and Yu. Nesterov
Stochastic subspace cubic Newton method
ICML 2020

(123) Mher Safaryan[p], Egor Shulgin[m]and P. Richtárik
Uncertainty principle for communication compression in distributed and federated learning and the search for an optimal compressor
Information and Inference: A Journal of the IMA, 2021
Federated learning paper

(122) F. Hanzely[d]and P. Richtárik
Federated learning of a mixture of global and local models
`arXiv:2002.05516`
Federated learning paper

(121) S. Horváth[d], L. Lei, P. Richtárik and M. I. Jordan
Adaptivity of stochastic gradient methods for nonconvex optimization
`arXiv:2002.05359`

(120) F. Hanzely[d], D. Kovalev[d]and P. Richtárik
Variance reduced coordinate descent with acceleration: new method with a surprising application to finite-sum problems
ICML 2020

(119) A. Khaled[i]and P. Richtárik
Better theory for SGD in the nonconvex world
`arXiv:2002.03329`

Prepared in 2019

(118) A. Khaled[(i)], K. Mishchenko[(d)]and P. Richtárik
Tighter theory for local SGD on identical and heterogeneous data
AISTATS 2020
Federated learning paper

(117) S. Chraibi[(i)], A. Khaled[(i)], D. Kovalev[(i)], A. Salim[(p)], P. Richtárik and M. Takáč
Distributed fixed point methods with compressed iterates
`arXiv:1912.09925`
Federated learning paper

(116) S. Horváth[(d)], C.-Y. Ho, Ľ. Horváth[(i)], A. Narayan Sahu, M. Canini and P. Richtárik
IntML: Natural compression for distributed deep learning
Workshop on AI Systems at Symposium on Operating Systems Principles 2019 (SOSP'19)

(115) D. Kovalev[(m)], K. Mishchenko[(d)]and P. Richtárik
Stochastic Newton and cubic Newton methods with simple local linear-quadratic rates
NeurIPS 2019 Workshop: Beyond First Order Methods in ML

(114) A. Khaled[(i)], K. Mishchenko[(d)]and P. Richtárik
Better communication complexity for local SGD
NeurIPS 2019 Workshop: Federated Learning for Data Privacy and Confidentiality
Federated learning paper

(113) A. Khaled[(i)]and P. Richtárik
Gradient descent with compressed iterates
NeurIPS 2019 Workshop: Federated Learning for Data Privacy and Confidentiality
Federated learning paper

(112) A. Khaled[(i)], K. Mishchenko[(d)]and P. Richtárik
First analysis of local GD on heterogeneous data
NeurIPS 2019 Workshop: Federated Learning for Data Privacy and Confidentiality
Federated learning paper

(111) J. Xiong, P. Richtárik and W. Heidrich
Stochastic convolutional sparse coding
International Symposium on Vision, Modeling and Visualization, 2019
VMV 2019 Best Paper Award

(110) X. Qian[(p)], Z. Qu and P. Richtárik
L-SVRG and L-Katyusha with arbitrary sampling
Journal of Machine Learning Research 22(112):1–47, 2021

(109) X. Qian[(p)], A. Sailanbayev[(d)], K. Mishchenko[(d)]and P. Richtárik
MISO is making a comeback with better proofs and rates
`arXiv:1906.01474`

(108) E. Gorbunov[(i)], Adel Bibi, Ozan Sezer, El Houcine Bergou[(p)]and P. Richtárik
A stochastic derivative free optimization method with momentum
NeurIPS 2019 Workshop: Optimization Foundations for Reinforcement Learning
ICLR 2020

(107) M. Safaryan and P. Richtárik
Stochastic sign descent methods: New algorithms and better theory

ICML 2021

(106) Adil Salim[(p)], Dmitry Kovalev[(m)] and P. Richtárik
Stochastic proximal Langevin algorithm: potential splitting and nonasymptotic rates
NeurIPS 2019

(105) E. Bergou[(p)], M. Canini, A. Dutta[(p)], P. Richtárik and Y. Xiao[(i)]
Direct nonlinear acceleration
`arXiv:1905.11692`

(104) K. Mishchenko[(d)] and P. Richtárik
A stochastic decoupling method for minimizing the sum of smooth and non-smooth functions
`arXiv:1905.11535`

(103) K. Mishchenko[(d)], D. Kovalev[(m)], E. Shulgin[(i)], P. Richtárik and Y. Malitsky
Revisiting stochastic extragradient
NeurIPS 2019 Workshop: Optimization Foundations for Reinforcement Learning
AISTATS 2020

(102) F. Hanzely[(d)] and P. Richtárik
One method to rule them all: variance reduction for data, parameters and many new methods
Submitted to: *Journal of Machine Learning Research*
`arXiv:1905.11266`

(101) E. Gorbunov[(i)], F. Hanzely[(d)] and P. Richtárik
A unified theory of SGD: variance reduction, sampling, quantization and coordinate descent
AISTATS 2020

(100) S. Horváth[(d)], C.Y. Ho, L. Horváth[(i)], A. N. Sahu, M. Canini and P. Richtárik
Natural compression for distributed deep learning
`arXiv:1905.10988`

(99) R. M. Gower, D. Kovalev[(m)], F. Lieder and P. Richtárik
RSN: Randomized Subspace Newton
NeurIPS 2019

(98) A. Dutta[(p)], F. Hanzely[(d)], J. Liang and P. Richtárik
Best pair formulation & accelerated scheme for non-convex principal component pursuit
IEEE Transactions on Signal Processing 26:6128–6141, 2020

(97) N. Loizou[(d)] and P. Richtárik
Revisiting randomized gossip algorithms: general framework, convergence rates and novel block and accelerated protocols
IEEE Transactions on Information Theory 67(12):8300–8324, 2021

(96) N. Loizou[(d)] and P. Richtárik
Convergence analysis of inexact randomized iterative methods
SIAM Journal on Scientific Computing 42(6), A3979–A4016, 2020

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