

Rustem Islamov

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EDUCATION

PhD in Computer Science

University of Basel, Supervisor: [Aurelien Lucchi](#)

Oct. 2023 – Pres.

Basel, Switzerland

Master of Science in Applied Mathematics

Institut Polytechnique de Paris

Sept. 2021 – Aug. 2023

Palaiseau, France

Supervisor: [Olivier Fercoq](#), Thesis supervisor: [Dan Alistarh](#)

GPA: 17.65/20, [transcript of records](#)

Bachelor of Science in Applied Mathematics and Physics

Moscow Institute of Physics and Technology

Sept. 2017 – July 2021

Supervisor: [Peter Richtárik](#),

Dolgoprudny, Russia

GPA: 4.95/5 (9.27/10), Top 3 at the department, [transcript of records](#)

RESEARCH INTERESTS

Deep Learning (loss landscape of neural networks), Optimization (adaptive algorithms, bilevel optimization, optimization for deep learning, differential privacy, distributed optimization)

PUBLICATIONS

12. [E. M. Compagnoni](#), [T. Liu](#), [R. Islamov](#), [F. N. Proske](#), [A. Orvieto](#), [A. Lucchi](#). **A SDEs for Adaptive Methods: The Role of Noise**, under submission, 2024.
11. [R. Islamov](#), [N. Ajroldi](#), [A. Orvieto](#), [A. Lucchi](#). **Loss Landscape Characterization of Neural Networks without Over-Parametrization**, [arXiv preprint arXiv: 2410.12455](#), accepted to NeurIPS 2024, 2024.
10. [R. Islamov](#)^{*}, [Y. Gao](#)^{*}, [S. Stich](#) (*equal contribution). **Near Optimal Decentralized Optimization with Compression and Momentum Tracking**, [arXiv preprint arXiv: 2405.20114](#), 2024.
9. [Y. Gao](#)^{*}, [R. Islamov](#)^{*}, [S. Stich](#) (*equal contribution). **EControl: Fast Distributed Optimization with Compression and Error Control**, in [Proc. of the 12th International Conference on Learning Representations](#), 2023.
8. [R. Islamov](#), [M. Safaryan](#), [D. Alistarh](#). **AsGrad: A Sharp Unified Analysis of Asynchronous-SGD Algorithms**, in [Proc. of the 27th International Conference on Artificial Intelligence and Statistics](#), 2023.
7. [K. Mishchenko](#), [R. Islamov](#), [E. Gorbunov](#), [S. Horváth](#). **Partially Personalized Federated Learning: Breaking the Curse of Data Heterogeneity**, [arXiv preprint arXiv: 2305.18285](#), 2023.
6. [S. Khirirat](#), [E. Gorbunov](#), [S. Horváth](#), [R. Islamov](#), [F. Karay](#), [P. Richtárik](#). **Clip21: Error Feedback for Gradient Clipping**, [arXiv preprint arXiv: 2305.18929](#), 2023.
5. [M. Makarenko](#), [E. Gasanov](#), [R. Islamov](#), [A. Sadiev](#), [P. Richtárik](#). **Adaptive Compression for Communication-Efficient Distributed Training**, [Transactions on Machine Learning Research](#), 2022.
4. [R. Islamov](#), [X. Qian](#), [S. Hanzely](#), [M. Safaryan](#), [P. Richtárik](#). **Distributed Newton-Type Methods with Communication Compression and Bernoulli Aggregation**, [Transactions on Machine Learning Research](#), 2022.
3. [X. Qian](#), [R. Islamov](#), [M. Safaryan](#), [P. Richtárik](#). **Basis Matters: Better Communication-Efficient Second Order Methods for Federated Learning**, in [Proc. of the 25th International Conference on Artificial Intelligence and Statistics](#), 2022.
2. [M. Safaryan](#), [R. Islamov](#), [X. Qian](#), [P. Richtárik](#). **FedNL: Making Newton-Type Methods Applicable to Federated Learning**, In [Proc. of 39th International Conference on Machine Learning](#), 2022.
1. [R. Islamov](#), [X. Qian](#), [P. Richtárik](#). **Distributed Second Order Methods with Fast Rates and Compressed Communication**, In [Proc. of 38th International Conference on Machine Learning](#), 2021.

PAST INTERNSHIPS

Internship at Distributed Algorithms and Systems Lab IST Austria , Supervisors: Mher Safaryan , Dan Alistarh	Apr. 2023 – Oct. 2023 Klosterneuburg, Austria
Internship at Machine Learning and Optimization Lab EPFL , Supervisors: Hadrien Hendrikx , Martin Jaggi	Apr. 2022 – Aug. 2022 Lausanne, Switzerland
Internship at Optimization and Machine Learning Lab KAUST , Supervisor: Peter Richtárik	Mar. 2021 – Aug. 2021 Jul. 2020 – Dec. 2020 Thuwal, Saudi Arabia

SCHOLARSHIPS, HONORS AND AWARDS

French Embassy Scholarship Given to students enrolled to French universities with high academic achievements; 700 Euro per month	Sept. 2022 – May. 2023
PhD Track Excellence Scholarship IP Paris awards merit-based excellence scholarships for students enrolled in PhD tracks; 1000 Euro per month	Sept. 2021 – Mar. 2022 Sept. 2022 – Mar. 2023
Increased State Academic Scholarship Given to 4 year Bachelor and Master students at MIPT with scientific achievements; 16,000 Russian roubles per month	Feb. 2021 – June 2021 Sept. 2020 – Jan. 2021
Prizewinner of Student Olympiad in Maths “I am professional” Student Olympiad organized by Yandex and MIPT	Apr. 2020
Abramov scholarship Given to 1-3 year Bachelor students with the best grades at MIPT; 12,000 Russian rubles per month	Sept. 2017 – June 2020
Prizewinner of Final Round of All-Russian Physics Olympiad	Apr. 2016
Participant of Final Round of All-Russian Physics Olympiad	2015, 2017

TALKS AND POSTERS

Invited Talk at Rising Stars in AI Symposium at KAUST workshop, Links: paper , slides	21 February, 2024
Talk at NTDS workshop, Links: paper	24 October, 2023
Talk at CISPA for the group of Prof. Sebastian Stich , Links: paper	16 March, 2023
Talk at ETH AI Center Symposium for PhD fellows, Links: paper	9-10 February, 2023
Prerecorded Talk at KAUST Conference on Artificial Intelligence , Links: video , paper	28 April, 2021

REVIEWING AND TEACHING

Teaching Assistant for Continuous Optimization course	Spring Semester 2024
Reviewer for Transactions on Machine Learning Research	2023-2024
Reviewer for Conference on Neural Information Processing Systems	2024
Reviewer for International Conference on Machine Learning (ICML 2024)	2024
Reviewer for Journal on Machine Learning Research (JMLR)	2024
Reviewer for Journal of Parallel and Distributed Computing (JPDC)	2024
Reviewer for Journal of Optimization Theory and Applications (JOTA)	2023
Reviewer for Artificial Intelligence and Statistics Conference (AISTATS 2024)	2023-2024
Reviewer for Neural Information Processing Systems (NeurIPS)	2024

SUMMER SCHOOLS

PRAIRIE/MIAI AI Summer School , Links: certificate	5-9 July, 2021
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TECHNICAL SKILLS

Programming Languages: Python (NumPy, Matplotlib, PyTorch, Pandas), C++, LaTeX	
Mathematics: Calculus, Linear Algebra, Probability Theory, Convex Analysis, Deep Learning	
LANGUAGES	HOBBIES AND INTERESTS

Russian: Native	Football, former member of student football team
English: Advanced (C1)	Travelling, hiking, photo shooting
French: Elementary (A2)	