

Rustem Islamov

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EDUCATION

PhD in Computer Science

[University of Basel](#)

Oct. 2023 – Pres.

Basel, Switzerland

Master of Science in Applied Mathematics

[Institut Polytechnique de Paris](#)

Sept. 2021 – Aug. 2023

Palaiseau, France

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

Dolgoprudny, Russia

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

RESEARCH INTERESTS

Machine Learning, Optimization, Distributed Optimization

RECENT RESEARCH PROJECTS

Error-Feedback for SGD

[CISPA](#), Supervisor: [Sebastian Stich](#)

Oct. 2022 – Oct. 2023

Saarbrücken, Germany

Brief description: develop a theory for SGD with biased compression which recovers optimal rates in all possible scenarios.

Analysis of Gradient-type methods over directed graphs

[EPFL](#), Supervisor: [Hadrien Hendriks](#), Links: [technical report](#)

Apr. 2022 – Aug. 2022

Lausanne, Switzerland

Brief description: development of a theory for gradient-type methods over directed graphs. The goal is to create a method which supports stochastic updates, variance reduction and acceleration and whose convergence rates match optimal rates in undirected case.

Adaptive stepsize selection for PDHG algorithm

[IP Paris](#), Supervisor: [Olivier Fercoq](#), Links: [technical report](#)

Sept. 2021 – Mar. 2021

Palaiseau, France

Brief description: the goal is to develop a mechanism for adaptive stepsize selection for PDHG. The idea is based on checking in each iteration the Quadratic Error Bound inequality introduced in [\[Fercoq, 2021\]](#).

Second Order Methods for Distributed Optimization

[KAUST](#), Supervisor: [Peter Richtárik](#)

Jul. 2020 – Dec. 2020

Thuwal, Saudi Arabia

Brief description: development of a theory for Newton-type methods for distributed optimization. The goal is to create the first communication-efficient Newton-type method that inherits its local superlinear convergence. As a part of internship, I attended the course on modern analysis of a family SGD algorithms by Prof. Richtárik.

PUBLICATIONS

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. Karray, 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.

RESEARCH VISITS AND 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

TALKS AND POSTERS

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

Poster at [NeurIPS](#) workshop: [Order up! The Benefits of Higher-Order Optimization in Machine Learning](#), Links: [poster](#), [paper](#)

2 December, 2022

Poster at [International Conference on Artificial Intelligence and Statistics](#),
Links: [poster](#), [paper](#)

29 March, 2022

Prerecorded Talk at [Beyond first-order methods in ML systems workshop](#),
Links: [video](#), [paper](#)

24 July, 2021

Poster at [International Workshop on Federated Learning for User Privacy and Data Confidentiality](#), Links: [poster](#), [paper](#)

24 July, 2021

Poster and Prerecorded Talk at [International Conference on Machine Learning](#),
Links: [video](#), [poster](#), [paper](#)

22 July, 2021

Poster at [PRAIRIE/MIAI AI Summer School](#), Links: [poster](#), [paper](#)

6 July, 2021

Talk at [Maths & AI: MIPT-UGA young researchers workshop](#), Links: [video](#), [slides](#), [paper](#)

1 July, 2021

Prerecorded Talk at [KAUST Conference on Artificial Intelligence](#), Links: [video](#), [paper](#)

28 April, 2021

Poster at [NSF-TRIPODS Workshop on Communication Efficient Distributed Optimization](#), Links: [poster](#), [paper](#)

9 April, 2021

SUMMER SCHOOLS

[PRAIRIE/MIAI AI Summer School](#), Links: [certificate](#)

5-9 July, 2021

SCHOLARSHIPS, HONORS AND AWARDS

French Embassy Scholarship

Sept. 2022 – May. 2023

Given to students enrolled to French universities with high academic achievements; 700 Euro per month

PhD Track Excellence Scholarship

Sept. 2021 – Mar. 2022

IP Paris awards merit-based excellence scholarships for students enrolled in PhD tracks; 1000 Euro per month

Sept. 2022 – Mar. 2023

Increased State Academic Scholarship

Feb. 2021 – June 2021

Given to 4 year Bachelor and Master students at MIPT with scientific achievements; 16,000 Russian roubles per month

Sept. 2020 – Jan. 2021

Prizewinner of Student Olympiad in Maths

Apr. 2020

“I am professional” Student Olympiad organized by Yandex and MIPT

Abramov scholarship

Sept. 2017 – June 2020

Given to 1-3 year Bachelor students with the best grades at MIPT; 12,000 Russian roubles per month

Prizewinner of Final Round of All-Russian Physics Olympiad

Apr. 2016

Participant of Final Round of All-Russian Physics Olympiad

2015, 2017

TECHNICAL SKILLS

Programming Languages: Python (NumPy, Matplotlib, PyTorch, Pandas), C++, LaTeX
Mathematics: Calculus, Linear Algebra, Probability Theory, Convex Analysis

LANGUAGES

Russian: Native
English: [Advanced \(C1\)](#)
French: Elementary (A1)

HOBBIES AND INTERESTS

Football, former member of student football team
Travelling, hiking, photo shooting

Last updated on October 27th 2023