

# ELNUR GASANOV

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## PUBLICATIONS

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### **The Stochastic Multi-Proximal Method for Nonsmooth Optimization**

Laurent Condat, [Elnur Gasanov](#), Peter Richtárik

Submitted to ICML 2025

### **Speeding Up Stochastic Proximal Optimization In The High Hessian Dissimilarity Setting**

[Elnur Gasanov](#), Peter Richtárik

<https://arxiv.org/abs/2412.13619>

### **Error Feedback Reloaded: From Quadratic to Arithmetic Mean of Smoothness Constants**

Peter Richtárik, [Elnur Gasanov](#), Konstantin Burlachenko

- Proceedings of the 12th International Conference on Learning Representations (ICLR 2024)
- <https://arxiv.org/abs/2402.10774>

### **Error Feedback Shines when Features are Rare**

Peter Richtárik, [Elnur Gasanov](#), Konstantin Burlachenko

<https://arxiv.org/abs/2305.15264>

### **Understanding Progressive Training Through the Framework of Randomized Coordinate Descent**

Rafał Szlendak, [Elnur Gasanov](#), Peter Richtárik

- Proceedings of the 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024)
- <https://arxiv.org/abs/2306.03626>

### **Adaptive Compression for Communication-Efficient Distributed Training**

Maksim Makarenko, [Elnur Gasanov](#), Abdurakhmon Sadiev, Rustem Islamov, Peter Richtárik

- Transactions on Machine Learning Research
- <https://arxiv.org/abs/2211.00188>

### **3PC: Three Point Compressors for Communication-Efficient Distributed Training and a Better Theory for Lazy Aggregation**

Peter Richtárik, Igor Sokolov, Ilyas Fatkhullin, [Elnur Gasanov](#), Zhize Li, Eduard Gorbunov

- Proceedings of the 39th International Conference on Machine Learning (ICML 2022)
- <https://arxiv.org/abs/2202.00998>

### **FLIX: A Simple and Communication-Efficient Alternative to Local Methods in Federated Learning**

[Elnur Gasanov](#), Ahmed Khaled, Samuel Horvath, Peter Richtárik

- Proceedings of the 25th International Conference on Artificial Intelligence and Statistics (AISTATS 2022)
- <https://arxiv.org/abs/2111.11556>

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

Dmitry Kovalev, [Elnur Gasanov](#), Alexander Gasnikov, Peter Richtárik

- Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS 2021)
- <https://arxiv.org/abs/2106.04469>

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

Grigory Malinovsky, Dmitry Kovalev, [Elnur Gasanov](#), Laurent Condat, Peter Richtárik

- Proceedings of the 37th International Conference on Machine Learning (ICML 2020)
- <https://arxiv.org/abs/2004.01442>

### Stochastic Spectral and Conjugate Descent Methods

Dmitry Kovalev, Eduard Gorbunov, Elnur Gasanov, Peter Richtárik

- Proceedings of the 32th Conference on Neural Information Processing Systems (NeurIPS 2018)
- <https://arxiv.org/abs/1802.03703>

### Creation of approximating scalogram description in a problem of movement prediction

Elnur Gasanov, Anastasia Motrenko

- "Machine Learning and Data Analysis", Vol. 3, #2, 2017
- <http://jmla.org/papers/doc/2017/no2/Gasanov2017ECoGAnalysis.pdf> (in russian)

## CAREER SYNOPSIS

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Ph.D. researcher at KAUST Center of Excellence for Generative AI, Optimization & Machine Learning team. Authored numerous peer-reviewed papers, especially featured in top conferences such as ICML and NeurIPS. Honored with the Dean's List Award for academic distinction at KAUST. Teaching Assistant at the Federated Learning course.

## EDUCATION

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### Ph.D. in Computer Science

Jan. 2020 - May 2025

*King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

Research Focus: Compression and Personalization for Federated Learning

Academic PI: Peter Richtárik

### Master of Science in Computer Science

Sep. 2018 - Dec. 2019

*King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

GPA: **3.67/4.00**

### Bachelor of Science in Applied Mathematics and Physics

Sep. 2014 - Jun. 2018

*Moscow Institute of Physics and Technology, Moscow, Russia*

Average Grade: **8.66/10.00**

## PROFESSIONAL EXPERIENCE

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### Ph.D. Researcher

01/2020 - Present

*King Abdullah University of Science and Technology, Artificial Intelligence Initiative*

Conducted research in Distributed Learning, collaborating with a team of 15+ researchers. Published 5 papers in peer-reviewed conferences and journals. Utilized various Python packages (JAX, FedJAX, Optax) in computational experiments. Recognized with the Dean's List Award (Top 20%) for outstanding academic performance.

### Research Scientist Intern

06/2024 - 07/2024

*The Exploration and Petroleum Engineering Center - Advanced Research Center, Aramco*

**Project Title:** Selective Memorization (Forgetting): Strategies for Partial Data Removal in AI Systems

Developed a novel technique for addressing Machine Unlearning challenges; co-designed a repository implemented in the PyTorch framework. A paper presenting the results is under preparation.

### Teaching Assistant

09/2023 - 09/2023

*King Abdullah University of Science and Technology, KAUST Academy*

Course: Federated Learning, Professor Peter Richtárik

Facilitated hands-on lab exercises, enhancing student understanding and practical skills. Designed and prepared

two comprehensive lab exercises to supplement course material.

## Research Scientist Intern

06/2019 - 07/2019

*University of Grenoble-Alpes, Laboratory Jean Kuntzmann*

Developed asynchronous lock-free algorithms for gradient descent, deriving convergence rates for both full and stochastic gradient cases. Analyzed the algorithm with constant and diminishing stepsizes.

## AWARDS AND RECOGNITIONS

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Invited to give a talk at a Federated Learning course	University of Tartu, Estonia	2023
CEMSE Dean's List Award (Top 20%)	KAUST, Saudi Arabia	2022
Best Reviewer Award (Top 10%) at ICML 2022	ICML Program Chairs, USA	2022
KAUST Fellowship for MS/PhD students	KAUST, Saudi Arabia	2018
Increased State Academic Scholarship	Ministry of Education, Russia	2017
Academic Excellence Scholarship	Non-profit Fund, Russia	2014-2017
Prize-Winner of "Future Scientists"	Moscow State University, Russia	2014
Prize-Winner of Economics Olympiad at the Regional Level	Ministry of Education, Russia	2013
Prize-Winner of Physics Olympiad at the Regional Level	Ministry of Education, Russia	2012-2014
Prize-Winner of Math Olympiad at the Regional Level	Ministry of Education, Russia	2012, 2014

## SKILLS

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<b>Mathematical</b>	Calculus, Linear Algebra, Algorithm Theory, Deep Learning
<b>Computational</b>	Python, PyTorch, JAX, FedJAX
<b>Tools</b>	LaTeX, Git
<b>Languages</b>	English (Advanced), Russian (Native)

## EXTRA CURRICULARS AND HOBBIES

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Hobbies: Fitness, Volleyball  
Volunteer: National Park Hunsrueck II, Deuselbach, Germany, 2017  
Volunteer: Environment and Legality at Vesuvio National Park, Ottaviano, Italy, 2016  
Volunteer: University "5top100" conference, Moscow, Russia, 2016  
Volunteer: Promoting Biodiversity in Neckertal, Brunnadern SG, Switzerland, 2015