

Slavomír Hanzely

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Synopses

- **Researcher** tackling problems on the boundary of Mathematics and Computer Science. Enjoying testing my skills against new challenges
- Proven performance in working independently, collaborating with peers, and leading projects
- Efficiently communicates complex ideas to audiences of all levels and cultures
- Qualities: quick learner, persistent, well-organized, high attention to details

Expertise

Optimization, Machine Learning, Federated Learning, Mathematics, Algorithms, Programming

Education

King Abdullah University of Science and Technology, Saudi Arabia

Ph.D., Applied Mathematics and Computational Sciences 2023 (expected)

MSc., Applied Mathematics and Computational Sciences 2020

Topic: Optimization for Machine Learning, group of [P. Richtárik](#)

Comenius University, Slovakia

BSc., Computer Science 2019

Thesis: Random sampling from uniform distribution on multidimensional polyhedra

Publications

- Sketch-and-Project Meets Newton Method: Global $\mathcal{O}(1/k^2)$ Convergence with Low-Rank Updates, Hanzely, [arxiv 2023](#)
- Convergence of First-Order Algorithms for Meta-Learning, [arxiv 2023](#)
Mishchenko, Hanzely, Richtárik
- A Damped Newton Method Achieves Global $\mathcal{O}(1/k^2)$ Convergence Rate, [NeurIPS 2022](#)
Hanzely, Kamzolov, Pasechnyuk, Gasnikov, Richtárik, Takáč
- Distributed Newton-Type Methods with Communication Compression, [arxiv 2022](#)
Islamov, Qian, Hanzely, Safaryan, Richtárik
- ZeroSARAH: Nonconvex Optimization with Zero Full Gradient Computation, [arxiv 2021](#)
Li, Hanzely and Richtárik
- Lower Bounds & Optimal Algorithms for Personalized Federated Learning, [NeurIPS 2020](#)
F. Hanzely, S. Hanzely, Horváth and Richtárik
- Adaptive Learning of the Optimal Mini-Batch Size of SGD, [OPT-ML, NeurIPS 2020](#)
Alfarra, Hanzely, Albasyoni, Ghanem and Richtárik

Presentations

NeurIPS 22, ICCOPT 22, ISTA Austria, MBZUAI, Ecole Polytechnique, KINIT, Flatiron Inst.

Awards

King Abdullah University of Science and Technology

- Dean's Award (3 consecutive years)
- Ph.D. scholarship of USD 75,000/year
- MSc. scholarship of USD 70,000/year

[Vojtech Jarník International Mathematical Competition](#)

2017: 8-10th place (39 universities participated)

[Mathematical Olympiad](#)

2016: 3rd place, Slovak national round

International Mathematical Olympiad participation

2015: bronze medal, Middle European Mathematical Olympiad

Work Experience

Flatiron Institute, Simons Foundation

June 2022 – July 2022

Research associate, group of R. Gower

Investigated ML loss reformulations and designed fast variance-reduced algorithms.

Mohamed bin Zayed University of AI

Feb 2022 – Apr 2022

Research assistant, group of M. Takáč

Developed second-order optimization methods that are fast, practical and provably convergent.

- Resulting in a paper accepted at NeurIPS 2022 ([link](#))

Wincent (crypto trading company)

Jun 2020 – Aug 2020

Research intern / software engineer

Analyzed, modeled, designed practical algorithms to optimize resource allocation of the company; and implemented the developed methods under various constraints.

Mathematical Olympiad

2017 – 2019

- Marked problems at the national round (3 times)
- Organized national selection camp for the International Mathematical Olympiad
 - created the problem sets for a day and marked the solutions (3 times)
 - restructured format of the camp and created all problem sets (team of 4 people)

Extracurricular Activities

Trojsten (nonprofit organization)

2016 – 2019

Volunteer

- Prepared competitions and camps (in Math, CS) for talented high school students
 - co-organized 14 competitions (3 as a head organizer)
 - co-organized 20 camps (4 as a head organizer)
 - problem selection: 20 problem sets, ~200 hours of work
 - marked solutions: ~600 solutions, ~150 hours of work
- Lectured: delivered 38 lectures (including a half-day lecture)

King Abdullah University of Science and Technology

Teaching Assistant for Federated Learning research

Assisting students with following aspects of FL research: project choice, literature review, algorithm development, experiment design, result presentation, write-up & submission

Technical skills

Research

- Topics: Federated Learning, Higher-Order Algorithms, Stochastic Optimization
- Reviewing: TLMR (journal, exceptional reviewer), NeurIPS (conference), ICML (conference)
- Qualities: patience, persistence, well-organized

Programming

- Python, PyTorch, Julia, C/C++, Bash
- Flexibility: experience with Matlab, R, Mathematica, SQL, Java, Javascript, Haskell

Cross-cultural communication

- Co-organized a large ultimate frisbee tournament (largest tournament in MENA region & first mixed tournament in Saudi Arabia)
- Studying and working in various international communities
- Organizing a research group seminar
- Organizing a research session at IFORS 2023 conference
- Languages: English, Slovak, French (basics), Russian (passive), Spanish (passive)