

# RUSTAM LATYPOV

## Sublinear Algorithms Group

Aalto University, Finland

A fourth-year PhD student, advised by Jara Uitto. I am broadly interested in algorithm design and combinatorics. My main research interests lie in the mathematical foundations of distributed and parallel computing.

[rustamlatypov.github.io](https://rustamlatypov.github.io)

[rustam.latypov@aalto.fi](mailto:rustam.latypov@aalto.fi)



## EDUCATION

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- + **Doctoral Researcher** · Computer Science Jun 2021 –  
Sublinear Algorithms [Group](#), Supervised by Prof. [Jara Uitto](#) *Aalto University*
- + **Master of Science** · Mathematics and Operations Research · GPA 4.9/5 2019 – 2021  
Major in Applied Mathematics · 5/5 *Aalto University*  
Minor in Computer Science · 4.8/5 [rustamlatypov/masters-thesis](https://rustamlatypov.github.io/masters-thesis)
- + **Bachelor of Science** · Engineering Physics and Mathematics · GPA 4.9/5 2016 – 2019  
Major in Mathematics and Systems Analysis · 5/5 *Aalto University*  
Minor in Computer Science · 5/5 [rustamlatypov/bachelors-thesis](https://rustamlatypov.github.io/bachelors-thesis)

## AWARDS

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- ★ Awarded 5000€ – Encouragement grant, The Finnish Foundation for Technology Promotion [\[link\]](#)
- ★ Awarded 5000€ – Nokia Scholarship, Nokia Foundation [\[link\]](#)
- ★ Received 24-month funding for my doctoral studies (out of 20 applicants) – Dept. of CS, Aalto [\[link\]](#)
- ★ Awarded 1000€ for academic success in mathematics – Professor E. J. Nyström Fund [\[link\]](#)
- ★ Awarded  $3 \times 500\text{€}$  for general academic success – School of Science, Aalto [\[link\]](#)

## PUBLICATIONS (authors are ordered alphabetically, as is standard in the field)

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- 9. Near-Optimal Directed Low-Diameter Decompositions [\[doi, arXiv\]](#)  
*Karl Bringmann, Nick Fischer, Bernhard Haeupler, Rustam Latypov*  
International Colloquium on Automata, Languages, and Programming (ICALP) 2025
- 8. A Simple Parallel Algorithm with Near-Linear Work for Negative-Weight  
Single-Source Shortest Paths [\[doi, arXiv\]](#)  
*Nick Fischer, Bernhard Haeupler, Rustam Latypov, Antti Roeykoe, Aurelio Sulser*  
SIAM Symposium on Simplicity in Algorithms (SOSA) 2025
- 7. Adaptive Massively Parallel Coloring in Sparse Graphs [\[doi, arXiv\]](#)  
*Rustam Latypov, Yannic Maus, Shreyas Pai, Jara Uitto*  
ACM Symposium on Principles of Distributed Computing (PODC) 2024

6. Conditionally Optimal Parallel Coloring of Forests [doi, arXiv]  
*Christoph Grunau, Rustam Latypov, Yannic Maus, Shreyas Pai, Jara Uitto*  
 International Symposium on Distributed Computing (DISC) 2023
5. Adaptive Massively Parallel Connectivity in Optimal Space [video, doi, arXiv]  
*Rustam Latypov, Jakub Lacki, Yannic Maus, Jara Uitto*  
 ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) 2023
4. Fast Dynamic Programming in Trees in the MPC Model [doi, arXiv]  
*Chetan Gupta, Rustam Latypov, Yannic Maus, Shreyas Pai, Simo Särkkä, Jan Studený, Jukka Suomela, Jara Uitto, Hossein Vahidi*  
 ACM Symposium on Parallelism in Algorithms and Architectures (SPAA) 2023
3. Optimal Deterministic Massively Parallel Connectivity on Forests [doi, arXiv]  
*Alkida Balliu, Rustam Latypov, Yannic Maus, Dennis Olivetti, Jara Uitto*  
 ACM-SIAM Symposium on Discrete Algorithms (SODA) 2023
2. Exponential Speedup Over Locality in MPC with Optimal Memory [journal, doi, arXiv]  
*Alkida Balliu, Sebastian Brandt, Manuela Fischer, Rustam Latypov, Yannic Maus, Dennis Olivetti, Jara Uitto*  
 International Symposium on Distributed Computing (DISC) 2022
1. Memory Efficient Massively Parallel Algorithms for LCL Problems on Trees [video, doi, arXiv]  
*Sebastian Brandt, Rustam Latypov, Jara Uitto*  
 International Symposium on Distributed Computing (DISC) 2021

## ACADEMIC ACTIVITY

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**Reviewed** for STOC'26, SODA'26, FOCS'25, PODC'25, DISC'24, ICALP'24, ITCS'24, SWAT'24, PODC'23, DISC'23, PODC'22, DISC'22, DISC'21, OPODIS'20

**Teaching** at Aalto University

- ◊ Advanced Course in Algorithms – Fall 2022, Fall 2023 (Head TA) [\[link\]](#)
- ◊ Principles of Algorithmic Techniques – Fall 2021, Fall 2025 (TA) [\[link\]](#)

**Supervised** an MSc thesis

- ◊ Hannes Sederholm, 2022 – *Distributed Drawing of Planar Graphs in the CONGEST model* [\[link\]](#)

## PROGRAMMING PROJECTS – [github.com/rustamlatypov](https://github.com/rustamlatypov)

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- \* **Parallel matrix multiplication** C++  
 Parallel (CPU) matrix multiplication achieving 500-fold speedup w.r.t. sequential
- \* **Tile-matching game** C++  
 Tournament grade Tetris and Pentis with controls in accordance with the Super Rotation System
- \* **Parallel radix sort** Scala  
 Sequential and parallel (CPU) LSD radix sorts achieving 5- and 15-fold speedups w.r.t. scala.quickSort

- \* **Inverse problem for resistor networks** MATLAB  
Solving non-linear, ill-posed inverse problems for resistor networks both symbolically and numerically
- \* **Machine learning classifier for music genres** Python  
Solving a skewed, multiclass music genre classification problem with supervised PCA and SVM
- \* **Parallel password cracker** Python  
A command-line tool for cracking passwords in parallel (CPU) using dictionary and hybrid attacks

## WORK EXPERIENCE

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- **Doctoral researcher** · Aalto University Jun 2021 –  
Interested in the mathematical foundations of distributed and parallel computing. So far, my work has mainly focused on graph coloring and connectivity problems in different parallel models of computation.
- **Research assistant** · Aalto University Mar 2020 – May 2021  
Worked on distributed graph algorithms in the Massively Parallel Computation model. Developed and published a state-of-the-art graph coloring algorithm (Master's thesis).
- **Giant Leap Intern** · Vaisala Oyj Jun – Aug 2019  
Developed software that successfully forecasted test failures in large scale radiosonde production using data mining, feature engineering and machine learning (XGBoost, Python).
- **Research assistant** · Aalto University Jun – Aug 2018  
Studied ill-posed non-linear inverse problems for resistor networks both symbolically and numerically (Bachelor's thesis).