

RUSTAM LATYPOV

Doctoral Candidate · Theoretical Computer Science
Aalto University, Finland



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EDUCATION

- **Doctoral Candidate** · Aalto University Jun 2021 –
Theoretical Computer Science [Group](#)
Supervisor: Prof. [Jara Uitto](#)
Funded by the CS department's competitive funding grant
- **Master of Science** · Aalto University · GPA 4.9/5 2019 – 2021
Mathematics and Operations Research
Major: Applied Mathematics · 5/5 **Minor:** Computer Science · 5/5
github.com/rustamlatypov/masters-thesis
- **Bachelor of Science** · Aalto University · GPA 4.9/5 2016 – 2019
Engineering Physics and Mathematics
Major: Mathematics and Systems Analysis · 5/5 **Minor:** Computer Science · 5/5
github.com/rustamlatypov/bachelors-thesis

ACADEMIC ACTIVITY

Publications (authors in alphabetical order, as is standard in the field)

- Fast dynamic programming in trees in the MPC model [arXiv]
with *Chetan Gupta, Yannic Maus, Shreyas Pai, Simo Särkkä, Jan Studený, Jukka Suomela, Jara Uitto, and Hossein Vahidi*
ACM Symposium on Parallelism in Algorithms and Architectures, **SPAA**, 2023.
- Adaptive Massively Parallel Connectivity in Optimal Space [arXiv]
with *Jakub Lacki, Yannic Maus, Jara Uitto*
ACM Symposium on Parallelism in Algorithms and Architectures, **SPAA**, 2023.
- Optimal Deterministic Massively Parallel Connectivity on Forests [doi, arXiv]
with *Alkida Balliu, Yannic Maus, Dennis Olivetti, Jara Uitto*
ACM-SIAM Symposium on Discrete Algorithms, **SODA**, 2023

- Exponential Speedup Over Locality in MPC with Optimal Memory [\[doi, arXiv\]](#)
with *Alkida Balliu, Sebastian Brandt, Manuela Fischer, Yannic Maus, Dennis Olivetti, Jara Uitto*
International Symposium on Distributed Computing, **DISC**, 2022
- BA: Memory Efficient Massively Parallel Algorithms for LCL Problems on Trees [\[video, doi, arXiv\]](#)
with *Sebastian Brandt, Jara Uitto*
International Symposium on Distributed Computing, **DISC**, 2021
- Coloring Trees in Massively Parallel Computation [\[arXiv\]](#)
with *Jara Uitto*
CoRR 2021.

DISC is a top venue in distributed computing, and SODA in all theoretical computer science

Teaching

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

Reviewer (at) PODC'23, DISC'22, PODC'22, DISC'21, OPODIS'20

AWARDS (2021-2022)

- Granted 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 500€ + 2 × 500€ for general academic success – School of Science, Aalto [\[link\]](#) [\[link\]](#)

WORK EXPERIENCE

- **Doctoral candidate** · Aalto University Jun 2021 –
Charting the complexity landscape of fundamental graph problems, and exploring the algorithmic applications of powerful probabilistic tools in the context of Massively Parallel Computation.
- **Research assistant** · Aalto University Mar 2020 – May 2021
Worked on distributed graph algorithms in low-space Massively Parallel Computation. Developed a deterministic, state-of-the-art 3-coloring algorithm for trees (Master's thesis, see manuscript below).
- **Giant Leap Intern** · Vaisala Oyj Jun – Aug 2019
Developed software for forecasting 20% of the test failures in large scale radiosonde production using data mining, feature engineering and machine learning (XGBoost, Python).
- **Research assistant** · Aalto University Jun – Aug 2018
Solved non-linear, ill-posed inverse problems for resistor networks both symbolically and numerically using the Gauss-Newton algorithm and Tikhonov regularization (Bachelor's thesis, see project below).

PROGRAMMING

Projects – github.com/rustamlatypov

- **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