



# FEDOR KUYANOV

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## Education

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### HSE University

September 2020 – July 2024

BSc majoring in Theoretical Computer Science, GPA 9.8/10, rank 1/260

Moscow, Russia

### Summer schools

- Contemporary Mathematics (Dubna, Russia, 2019)
- Harbour.Space Tech Scouts (Barcelona, Spain, 2019)
- Summer Conference of the Mathematical Tournament of Towns (Serbia, 2019)
- Summer Computer School (Russia, 2014 – 2017, levels C', B', B, A)

## Work experience

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### HSE, Laboratory of Theoretical Computer Science

September 2021 – present

Research assistant

Moscow, Russia

- Research in mathematical physics and number theory: quantum walks.
- Research in linear algebra and complexity theory: minimizing the number of operations for matrix multiplication.

### EPFL, Laboratory of Theoretical Computer Science

July 2023 – September 2023

Research assistant

Lausanne, Switzerland

- Research in randomized sublinear algorithms on graphs such as bipartiteness testing.

### Moscow State School №57

September 2022 – December 2022

Teaching assistant

Moscow, Russia

- Assisted calculus and programming classes in Moscow State School №57, one of the top math schools in Russia.

### Huawei

June 2022 – December 2022

Software Engineer

Moscow, Russia

- Member of the graph computing team focused on fluid and gas processes simulation on lattices.
- Implemented distributed versions of the Conjugate gradient method and Lanczos algorithm.

### Yandex

May 2021 – August 2021

Software Engineer Intern

Moscow, Russia

- Enhanced scenario classification of the voice assistant Alice by adapting the learning process for different devices.

### Summer informatics workshop

June 2020

Teaching assistant

Moscow, Russia

- Prepared Russian national team candidates to IOI by creating practice contests and tutorials.

## Publications

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1. Feynman checkers: number-theoretic properties (joint paper with A. Slizkov). *Reviews in Mathematical Physics*, 35:09 (2023) 2350022, arXiv:2210.07306

## Conference talks

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- Diophantine Analysis, Dynamics, and related topics (Haifa, Israel, 2023)
- Scientific workshop of the HSE TCS Laboratory (Voronovo, Russia, 2023)
- 29th International Scientific Conference “Lomonosov” (Moscow, Russia, 2022)

## Projects

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### MatrixMultiplication | *Python, PyTorch*

October 2023

- Python scripts generating optimal matrix multiplication algorithms for small sizes (up to 3).
- Uses modern optimization techniques from machine learning and performs greedy rounding to get rational coefficients.

### Wordle | *C++, JavaScript*

August 2022

- The goal of this game is to guess a 5-letter word in 6 tries based on the information about each letter.
- Implemented a strategy (using B&B algorithm and information theory) that achieves the world record of 3.42 tries.

### Fejudge | *Python, Linux kernel*

September 2021

- This is a management system for programming contests with a convenient web interface.
- Uses various Linux kernel features (such as cgroups) and supports simultaneous evaluation on different machines.

### TheTrueHat | *JavaScript, Vue*

August 2021

- This project allows playing the Hat (Alias) game from the browser.

### Kotline | *Kotlin, React, JavaScript*

January 2021

- Geometric puzzle where one must build the longest non-self-intersecting polygonal chain.

## Skills & interests

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**Programming languages:** C/C++, Python, Kotlin, HTML/CSS, JavaScript, Bash, SQL

**Libraries & frameworks:** QT, NumPy, matplotlib, pandas, PyTorch, Flask, React, Vue

**Tools:** CI/CD, git, docker, gdb, cmake

**Interested in:** quantum computing, algorithms and complexity theory, linear algebra, discrete math

## Scholarships & grants

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- Ilya Segalovich Scholarship, twice (2022, 2023)
- Tinkoff Scholarship (2022)
- Research and educational group “Combinatorial and numerical problems on lattices” (HSE, 2023)
- Project group “Lattice models” (HSE, 2020 – 2022)

## Competitions

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- Three times gold medal at IMC (2021 – 2023)
- Silver medal at Semifinal ICPC 2020, NERC
- Winner of several inter-university math competitions: NCUMC, OMOUS, MIPT, OSAM Comp'21
- Prize-winner of the All-Russian Olympiad in Mathematics (2018, 2019, 2020)
- Winner of the All-Russian Olympiad in Informatics (2018), prize-winner in 2017, 2019, 2020
- Six times winner of the International Mathematical Tournament of Towns (2014 - 2019)
- Grand prix and first prize at the international piano competition CMF 2015 (YouTube)

## Hobbies

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- Railway modeling, Lego
- Chess, speed-cubing (3x3, 36 secs), ping-pong
- Classical piano – finished 8-year Gnesin music school and performed with an orchestra, YouTube

## Languages

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- English: C1 (IELTS 7.5)
- Russian: Native speaker