Vadim Zaripov

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Education

Harvard University | *SM in Computer Science, May 2026*

- Selected courses: CS 229r: Coding Theory, CS 2252: Spectral Graph Theory, CS254: Formal Methods for Security, CS 2253: Seminar on Pseudorandomness and High Dimensional Expanders, CS 2260: Differential Privacy.

Harvard University | *AB in Computer Science with a Secondary Field in Mathematical Sciences, May 2026*

Research

Bivariate Linear Operator Codes with Aaron L. Putterman | arXiv, ISIT 2025

- Designed a generalization of linearly-extendible linear operator codes that captures more capacity-achieving codes.

Bounded Independence Edge Sampling for Combinatorial Graph Properties
with Aaron L. Putterman & Salil Vadhan | arXiv, CCC 2026

- Demonstrated connectedness and cycle-freeness guarantees for bounded-independence edge subsampling of graphs.
- Applied the sampling results to derandomize matroid basis finding algorithms for graphic and cographic matroids.

Honors and awards

- Graduated with Highest Honors in Computer Science (Harvard University, 2026)
- Phi Beta Kappa member, Alpha Iota Chapter of Massachusetts (Harvard Senior 48)
- All-Russian School Olympiad in Informatics, 2022, prize-winner (Russia top 100)

Internships & Work Experience

Optiver | *Software Engineering Intern* – Amsterdam, NL **July. 2025 – Aug. 2025**

- Worked in Delta 1 QR/Data Team; Optimized data pipelines generating datasets for the Delta 1 Research team

T-Bank Education | *Data Structures and Algorithms Tutor* – Remote **Feb. 2024 – Aug. 2024**

- Helped develop an algorithms course, which currently has 18000+ enrolled students. Prepared 40+ contests and lecture notes for topics in number theory, graph algorithms, dynamic programming, and Python language features.

Harvard Undergraduate Data Analytics Group | *Analyst* – Cambridge, MA **Sep. 2022 – Dec. 2023**

- Solved problems such as time-series analysis, natural language processing, and object categorization.

Skolkovo Institute of Science and Technology | *Research Intern* – Moscow, Russia **Jun. 2021 – Jul. 2021**

- Worked on an efficient pathfinding algorithm for autonomous robots. Utilized image filtering methods for line detection, used the pinhole camera model for mapping, and finally incorporated graph algorithms for pathfinding.

Projects

Distributed Lock Manager | *C* **Sep. 2024 – Nov. 2024**

- Developed a distributed system to manage access to 100 files stored and replicated across a cluster of servers.
- Implemented remote procedure calls using UDP sockets; coded the Raft consensus algorithm for log replication.

Python Information Flow (PIF), Team Project | *Python (AST, Pytest)* **Apr. 2024 – May 2024**

- Developed a prototype of an extension of Python that adds support for dynamic information flow tracking.
- Used formal logic to specify the type system and prove its properties. Utilized Python's AST module to parse and modify Python scripts' abstract syntax tree and add checks that ensure specified information flow restrictions.

Chickadee OS feature implementation (CS 161) | *C++, Assembly* **Jan. 2024 – May 2024**

- Developed multiple features for Chickadee, a teaching operating system, as Harvard's CS 161 course assignment.
- Implemented buddy allocation, process hierarchy, wait queues, locking mechanisms, buffer cache, and threads.
- Designed a VFS that supports disk files, pipes, console, and also allows encoding files for error-correction.
- Developed user-level scripts that test memory allocation, multiprocessing, cache eviction, and other functionality.

Podcast website, Personal Project | *ReactJS, TypeScript, Firebase (Firestore, Storage, Hosting)* **July 2023**

- Developed a website for the literature podcast. Used Firebase's document-oriented database to store information about podcast episodes. Designed the adaptive minimalist interface and used multiple OOP patterns.