

## Alek Westover

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### Education

**Massachusetts Institute of Technology**, Cambridge, MA

2022-present

Candidate for Bachelor's Degree in Mathematics with Computer Science

#### **Coursework:**

Reinforcement Learning, Natural Language Processing, Deep Learning

Discrete Probability and Stochastic Processes, Advanced Algorithms, Geometric Algorithms, Algorithmic Lower Bounds

Graph theory and Additive Combinatorics, Cryptography, Analysis of Boolean Functions, Number Theory

Linear Algebra, Abstract Algebra, Multivariable Calculus, Real Analysis, Differential Equations

### Publications (Note: In theoretical computer science, it is customary to sort the authors of each paper alphabetically.)

- Martin Farach-Colton, William Kuszmaul, Nathan S. Sheffield, and Alek Westover. "A Nearly Quadratic Improvement for Memory Reallocation." (SPAA '24).
- William Kuszmaul and Alek Westover. "Scheduling Jobs with Work-Inefficient Parallel Solutions". (SPAA '24)
- William Kuszmaul and Alek Westover. "The Variable-Processor Cup Game". (ITCS '21)
- William Kuszmaul and Alek Westover. "Cache-Efficient Parallel-Partition Algorithms using Exclusive-Read-and-Write Memory." (SPAA '20).

### Preprints

- Virginia Vassilevska Williams, Alek Westover. Listing 6-Cycles in Sparse Graphs.
- Alek Westover, Edward Yu, Kai Zheng. The Diamond Test: A Novel Direct Sum Test.
- Nathan S. Sheffield, Alek Westover. When to Give Up on a Parallel Implementation.
- Brian Liu, Nathan S. Sheffield, Alek Westover. Complexity of Multiple-Hamiltonicity in Graphs of Bounded Degree.
- Alek Westover. On the Relationship Between Several Variants of the Linear Hashing Conjecture.

### Skills

Data science, statistics and machine learning (Python, Julia); Full-stack web development (javascript, Flask / Node.js); C++; Systems engineering (Rust); English (native); Mandarin (fluent).

### Experiences

#### **MIT Summer Program in Undergraduate Research (Mentor: Kai Zheng)**

2024 summer

Received the "Hartley Rogers Jr. Prize" for developing a novel affinity property tester.

#### **Software Engineer Intern at Neon Databases (Serverless PostgreSQL startup)**

2023 summer

Systems engineering in Rust: added support for custom Postgres extensions.

#### **MIT UROP (Mentors: Virginia Williams, William Kuszmaul)**

2022-2024

Designed and analyzed algorithms and data structures.

#### **Software Engineer Intern at Beacon Biosignals (Healthcare AI startup)**

2019-2020

Worked in Julia to prepare large datasets for use in machine learning models (data wrangling).

#### **MIT PRIMES (Mentor: William Kuszmaul)**

2019-2020

#### **Canada/USA Mathcamp**

2019

#### **Regeneron Science Talent Search**

2020

National science fair for high school students, 7th place in USA, \$70,000 prize.

#### **Massachusetts Science Engineering Fair: Second Place Award**

2020

#### **Private Tutor (self-employed)**

2017-present

Teach math (e.g., calculus) and programming (e.g., python) to high schoolers and adults.