

Jacob Spivack

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EDUCATION

Tufts University

Medford, MA

- Bachelor of Science in Computer Science,
minor in Science, Technology, and Society

September 2022 – May 2026

- **The Ben Hescott Award for Excellence in Teaching:** Awarded by the Tufts CS Department to an undergraduate teaching assistant or fellow to recognize them for their excellence in teaching, particularly in introductory computer science.

PROGRAMMING SKILLS

- **Languages:** Python, C++, C, Java, Javascript, Typescript, HTML, CSS, Scheme, SML, Smalltalk
- **Technologies:** Git/GitHub, CLI, LaTeX, Valgrind, Gradescope, React, Next.js, Tailwind CSS, Prisma, PostgreSQL, Shell Scripting, Makefiles, GDB

EXPERIENCE

Computer Science Teaching Fellow

Medford, MA

- Tufts University

September 2024 - May 2026

- **New Prerequisite:** Spearheaded new computer science course at Tufts taught in Python, CS10, that serves as a prerequisite which aims to prepare students for our introductory C++ course, CS11.
- **Course Development:** Partnered with professor to develop and beta test coursework and exams. Formalized grading methodology and onboarded new TAs. Received the Ben Hescott Award for Excellence in Teaching for outstanding contributions to the Computer Science Department.

Computer Science Teaching Assistant

Medford, MA

- Tufts University

September 2023 - August 2024

- **Office Hours:** Over the course of six semesters, provided academic support to hundreds of students taking Tufts' introductory computer science classes.
- **Lab Leader:** Prepared and presented weekly recitation material, reinforcing lecture concepts while guiding students through laboratory assignments
- **Online Forum:** Answered over 400 student questions on the course online forum.

Jumbocode Developer

Medford, MA

- Tufts University

September 2023 - May 2024

- **Developed Web App:** Developed a full-stack scheduling app for SpeakOUT Boston so organizers could coordinate speakers for hundreds of events annually.
- **Full Stack:** Implemented engagements CRUD APIs in Next.js/Prisma and React UI components for sidebar navigation and editable profile tags.
- **Tech Stack:** Next.js, TypeScript, React, Tailwind CSS, Prisma, PostgreSQL.

PROJECTS

- **The Universal Machine:** An emulator for a 32-bit virtual machine in C.
 - **Architecture:** Architected a modular 32-bit virtual machine emulator in C, implementing 14 distinct assembly-level instructions including segmented memory I/O and bitwise operations.
 - **Memory Management:** Engineered a dynamic memory system utilizing Hanson's data structures, implementing a sequence-based queue to recycle unmapped memory identifiers and minimize reallocation overhead.
 - **Automated Testing:** Developed a comprehensive testing suite using shell scripting and custom binaries to validate edge cases, leveraging Valgrind to ensure memory safety and zero leaks.
- **Gerp:** A program that emulates grep Linux functionality in C++.
 - **Data Structures:** Developed a custom hash table utilizing an array of linked lists to implement chaining for collision resolution, securely managing heap-allocated key-value pairs.
 - **Memory Optimization:** Engineered a memory-efficient indexing system by mapping string keys to sets of positional pointers, maintaining a single directory structure copy to accelerate both case-sensitive and case-insensitive queries.
 - **Search & Traversal:** Implemented a recursive N-ary tree traversal algorithm to parse nested file directories and validated search accuracy using automated shell scripts for comprehensive diff testing.

LEADERSHIP EXPERIENCE

- **Tufts Wilderness Orientation** Medford, MA
Trip Leader April 2023 - May 2026
 - **Trip Leadership:** Led groups of ~10 incoming students on five-day backpacking, canoeing, and site-based service trips, maintaining group safety and making decisions in remote outdoor environments.
 - **Mentorship & Team Building:** Facilitated team-building activities and mentored incoming students, helping groups of strangers develop trust and community before beginning college.
 - **Outdoor Instruction:** Taught essential backcountry skills, supported participants with varying levels of outdoor experience, and maintained group morale throughout physically demanding trips.
- **Tufts Mountain Club and Tufts Climbing Team** Medford, MA
Operations Chair January 2023 - December 2024
 - **Event Planning:** Planned and orchestrated 100+ person college climbing events at gyms around Boston.
 - **Tech Admin:** Built website and Slack, organized a digital system where people could pair up and ride to the gym.