

EMILIO L. ALEMAN

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EDUCATION

Tufts University | Medford, MA

Bachelor of Science in Electrical Engineering & Computer Science | Minor: Engineering Management

Expected: May 2027

GPA: 3.1, Hispanic Scholarship Fund (HSF) Scholar, Code2040 Fellow, Stern Scholar, GFACT Certified

Relevant Coursework: Algorithms, Data Structures, Software Engineering, Security, Intro to Machine Learning, Machine Structures & Assembly Language Programming, Digital Electronics, Linear Systems, Embedded Systems, Operating Systems, Differential Equations.

TECHNICAL SKILLS

Software & Programming: Python, C, C++, Java, Kotlin, JavaScript, TypeScript, SQL, Supabase, x86 & 6502 Assembly, Bash

Web & App Development: MERN Stack, React/React Native, Tailwind CSS, Bootstrap, Node.js, Express, Next.js, Flask, FastAPI

Hardware & Embedded Systems: VHDL, SystemVerilog, Arduino, Embedded Systems, Networking Fundamentals, I2C / SPI / UART

Tools & Technologies: Docker, Git, Linux/Unix, OpenCV, MATLAB, Microsoft Azure (AZ-900 Certified)

RELATED EXPERIENCE

Tufts University Department of Computer Science | *CS 61: Discrete Mathematics Course Assistant*

September 2025 - Present

- Facilitate weekly office hours and recitation sessions for students, dissecting complex concepts in logic, set theory, and graph theory.
- Grade problem sets and exams; provide detailed and constructive feedback to support student comprehension & academic success.

Tufts University Undergraduate Admissions | *Admissions Intern*

August 2025 - Present

- Lead weekly virtual and in-person information sessions, panels, and large-scale Jumbo Day events to effectively communicate the Tufts undergraduate experience to prospective students and families.
- Conduct virtual interviews and engage in live student-centered chats, evaluating prospective applicants and addressing specialized inquiries regarding campus life and academic programs.
- Author and edit recruitment communications, including blog posts and targeted emails.

Telemetrics Inc. | *Robotics Engineering Intern* | Allendale, NJ

September 2022 - June 2023

- Engineered a barcode detection system using Python and OpenCV to optimize real-time image processing, demonstrating an ability to manage high-volume data and system performance.
- Designed and implemented a novel quality control process for PS-RM2-48 power supplies by monitoring dynamic voltage loads, emphasizing data-driven process optimization and robust systems design.
- Developed a low-level solution for real-time angular position tracking with Arduino and a Seeed XIAO RP2040, showcasing proficiency in embedded systems, automation, and technical troubleshooting.

TECHNICAL PROJECTS

JumBuddy | *JumboHack 2026 Overall 1st Place & Education Track Winner*

February 2026

- Engineered a VSCode extension using TypeScript to track student coding metrics (capturing keystrokes, insertion/deletion behavior, and file diffs in 5-second “debounce” intervals) to help professors quantify teaching effectiveness.
- Architected a full-stack web platform (React, Tailwind, Flask, PostgreSQL) that visualizes code churn and thrash, allowing educators to instantly analyze project hotspots and student struggles.
- Integrated an LLM to ingest pre-processed file snapshots, enabling professors to chat with the AI to qualitatively evaluate a student’s logic and full edit history timeline.
- Designed a custom callback-style UTLN authentication flow using JWTs and Supabase to overcome VSCode HTTPS proxy limitations, ultimately containerizing the entire application with Docker.

Income Equity & Affordability Analyzer | *Code2040 Hackathon Project* | Remote

July 2025

- Created a 6-field intake form (job, income, rent, ZIP, race, gender) that computes rent-burden (%) and living-wage delta (\$) for users by integrating 3 public datasets/APIs (MIT Living Wage Calculator, BLS job wage data, Pew Research).
- Delivered interactive equity visualizations comparing wages by race and gender, and a personalized “financial pressure” summary.
- Implemented a React + TypeScript front-end (~95% of the codebase) and a FastAPI backend, structured into 4 modules (routers, models, services, & data) to keep calculations modular and testable.

Universal Machine (UM) Emulator | *CS Class Project*

April 2024

- Developed a Universal Machine (UM) emulator in C to simulate a virtual machine with 32-bit segmented memory, supporting 14 operations including arithmetic, memory management, and I/O.
- Leveraged modular architecture for clean code, focusing on abstraction and efficient segment mapping to handle high memory demands and ensure fast execution.
- Optimized the emulator using profiling tools, reducing runtime by 96% and exceeding the reference solution on all 4 test cases.

Arith: Image Compression and Bit Manipulation System | *CS Class Project*

March 2024

- Built a lossy image compression system in C, reducing PPM image sizes by ~66% while preserving visual quality within 2% of the original image, by implementing bit-packing operations to store data fields (brightness, chroma, DCT coefficients) in 32-bit words.

SELECTED LEADERSHIP EXPERIENCE

CodePath | *Internship Connection Program (ICP)* | Remote

June 2025 - August 2025

- Gained experience in technical interviewing, resume building, and networking in this competitive preparatory program.

Tufts University Model United Nations (TUMUN) IX | *Secretary-General*

May 2024 - March 2025

- Organized a high school MUN conference with 300+ annual delegates; maintained website with 100+ monthly visitors.