

# Vedant Modi

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## EDUCATION

### Tufts University

August 2022 – May 2026

GPA 3.73, BS Computer Science, BS Mathematics, Dean's List (Fall 2022, Spring 2024)

Somerville, MA

Relevant Coursework: Algorithms, Data structures, Machine structure, Programming language theory, Abstract algebra, Probability theory

Network security, Assembly programming, Linguistics theory

## SKILLS

**Programming Languages:** TypeScript, React, Python, C/C++, x86-64 Assembly

**Tools and Technologies:** Node.js, DevOps, Docker, Django, MongoDB, PostgreSQL, AWS, Tailwind CSS, Figma, HTML

## EXPERIENCE

### Course Assistant for Machine Structure, Assembly Programming, and Data Structures

May 2023 – Present

Tufts University, Department of Computer Science

Somerville, MA

- Strengthened course infrastructure for **200+ students** by improving autograding software, staff software, and assignment solutions
- Contributed **20+ unit tests** to autograder by finding edge behavior in students' submissions
- Developed internal software to organize scoring of submissions between course staff using CI/CD pipelines to integrate updates into course infrastructure
- Graded assignments by studying **80+ submissions** for functionality, testing, and course coding standards
- Enriched students' experience by participating in internal grading reviews. Ensured constructive grading comments to help students understand course expectations.
- Reinforced course objectives and debugging principles during **1500+ student interactions** by explaining lecture topics and assignments in office hours
- Strengthened understanding of course material weekly for a **30+ student lab** by delivering comprehensive lectures
- Emphasized learning objectives for graduate offering of data structures by restructuring assignment scoring, incorporating new assignments, and holding virtual office hours

### Full Stack Developer

September 2023 – May 2024

Tufts JumboCode

Somerville, MA

- Enhanced the information display for the **1,000,000+ annual visitors** of the Emerald Necklace Conservancy by designing a full-stack web app in a tight-knit, agile team
- Created a secure page modification system for park administration by maintaining a MongoDB database for information, and an authentication system for editing privileges
- Automated database maintenance using PyMongo, reducing manual data handling tasks, and speeding up database work **by 30%**.
- Designed a cohesive user interface for **50+ pages** by creating and documenting React components in TypeScript

### Receptionist

May 2023 – Present

Tufts University, Office of Academic Space Management

Somerville, MA

- Service community via organizing mail, and analyzing building usage for largest academic buildings on Tufts campus.

### Visual Communications Intern

May 2021 – August 2021

Texas Heart Institute

Houston, TX

- Designed graphics and created animations representing cardiological research for publicity
- Interviewed for animation work by the *Houston Chronicle*

## RELEVANT PROJECTS

### Globetrotter | TypeScript, Node.js, Python, PostgreSQL

July 2024 – Present

- Created an animated, interactive travel sharing product by modeling, planning, and writing a full stack web application
- Designed a modern, lively frontend with a responsive map, menu, and user statistics page using React, Tailwind CSS, and APIs from Mapbox and deck.gl
- Unified user interface by **modeling 50 components** in Figma before development
- Displayed **over 40,000 airports** on map client using RESTful APIs to communicate between frontend and backend
- Enhanced airports data by synthesizing **20+ large-scale, open-source datasets** using CRUD applications developed in Python
- Hosted backend server by managing a PostgreSQL database within a Docker container on an AWS EC2 instance

### Universal Machine | C, x86-64 Assembly, Bash

November 2023 – December 2023

- Created a Turing Complete virtual machine using **object-oriented programming principles**, separating functionality like I/O, machine arithmetic, logic, and memory. Tested components with custom-devised unit-testing framework.
- Optimized the program by analyzing x86-64 Assembly instructions and **qcachegrind** and minimized expensive operations such as dereferencing or allocation through reuse of memory. Verified performance gains via benchmarking against **1,000,000,000+ instruction** binaries.
- Recreated the venerable HP15-C via Assembly instructions derived from the Universal Machine's ISA.

### Encrypted Instant Messenger | Python

January 2024 – April 2024

- Demonstrated proficiency in **network programming** and anonymous communication over 3 months by creating an end-to-end encrypted instant messenger using the AES-256 algorithm.

### World Clock | JavaScript, HTML, CSS

August 2023

- Constructed a web application showing the time of user-chosen cities, with a helpful, responsive map to aid in visualization.
- Integrated OpenStreetMap and MapBox libraries for graphics. APIs were chosen as they best met the scalability requirements.
- Published application to personal website with custom autocomplete search bar and tracked development with Git.

## EXTRACURRICULAR ACTIVITIES

**Spoken Languages:** Proficiency in English, Hindi, Spanish, and French

**Media:** Droneography, Photoshop, Lightroom, After Effects, Davinci Resolve Studio, Premiere Pro, InDesign, Wordpress

**Travel:** Hiking mountains, traveling to novel destinations, searching for amazing flight deals

**Standards:** Expert in recalling IATA airport codes, ISO country codes, and timezones