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: C/C++, Python, TypeScript, React, Rust, x86-64 Assembly, Standard ML
Tools and Technologies: Node.js, DevOps, Docker, Django, MongoDB, PostgresSQL, AWS, Tailwind CSS, Figma, HTML

Experience

Teaching Assistant for Machine Structure, Assembly Programming, and Data Structures May 2023 – Present
Tufts University, Department of Computer Science *Somerville, MA*

- Improved **150+ students'** ability to engineer large-scale, low-level programs by encouraging rigorous testing, building modular architecture, and harnessing existing libraries
- 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 **200+ 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.
- Improved student comprehension by leading review session for **100+ students** covering key course content and exam preparation
- Enhanced students' programming practices by leading a hands-on shell scripting workshop for **30+ students**
- Reinforced course objectives and debugging principles during **2000+ 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, PostgresSQL* 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 PostgresSQL 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

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, Urdu, 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