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, Network security, Multivariable calculus, Linear algebra

Skills

Programming Languages: TypeScript, React, Python, C/C++, x86-64 Assembly
Tools and Technologies: Node.js, DevOps, Docker, Django, MongoDB, PostgresSQL, 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 **60+ submissions** for functionality, testing, and course coding standards
- 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

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

Strava for Flights | *TypeScript, Node.js, Python, PostgresSQL* July 2024
- 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

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.

Universal Machine | *C, x86-64 Assembly, Bash* November – December 2023
- Created a Turing Complete virtual machine supporting I/O, machine arithmetic, logic, and memory tested 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.
- Recreated the venerable HP15-C via Assembly instructions derived from the Universal Machine's ISA.

vfl | *C, Python* October 2023 – February 2024
- Designed a file format that encodes flight itineraries into bitpacked data.
- Wrote a collection of Python modules that aid the compression, like quantizing timezones, or finding the UTC offset of an airport, given its code.

SSH Setup Guide | *shell, LaTeX* March 2024
- Wrote a concise guide for setting up a secure connection to a server.
- Described how to create public/private key pair to authenticate with server, how to setup a shell alias to quickly login to a server, and how to use key for password-less authentication in an SFTP connection.
- Created GitHub Actions pipeline to compile TeX→ PDF, publish to repository releases and webpage.

Encrypted IM | *Python* January 2024
- Implemented a peer-to-peer encrypted instant messenger using the AES-256 CBC cipher, as a practice in socket programming and encryption.

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