

# Vedant Modi

+1 (832) 963-0248 | [vedant@vedantmodi.com](mailto:vedant@vedantmodi.com) | [vedantmodi.com](http://vedantmodi.com) | [github.com/thevedantmodi](https://github.com/thevedantmodi) | [linkedin.com/in/thevedantmodi](https://linkedin.com/in/thevedantmodi)

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## 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

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**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

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## 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

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### Strava for Flights | TypeScript, Node.js, Python, PostgreSQL

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 PostgreSQL database with a Django application 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.

### vf | 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

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**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