

VATSAL PATEL

Mahavirnagar, Himatnagar, Gujarat 383001

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Summary

Computer Engineering student interested in AI, embedded systems, and software engineering. Passionate about building systems from first principles to understand machine learning, real-time software, and modern backend architectures.

Experience

AAOJI SHOPY PVT LTD

May 2026 – June 2026

Software Engineer Intern

Himatnagar, Gujarat

- Improved the company's website UI by refining layouts and enhancing user experience.
- Maintained and updated website content, ensuring functionality and consistency across pages.
- Fixed minor UI issues and collaborated with the team to implement design improvements.

Projects

NanoNet — Neural Network Framework From Scratch | Python, NumPy

Dec 2025

- Developed a neural network framework from scratch implementing forward/backward propagation, multiple optimizers (SGD, Adam, RMSProp, Momentum, Nesterov), and learning-rate schedulers.
- Implemented mini-batch, stochastic, and batch gradient descent with L1/L2 regularization, gradient clipping, and He initialization.
- Validated the framework by training an MLP on the MNIST dataset, achieving 97.3% test accuracy and 99.0% training accuracy while demonstrating convergence across multiple optimization algorithms.

Smart Helmet — IoT Emergency Detection System | ESP8266, Arduino, FastAPI, React Native, Firebase

Apr 2026

- Developed ESP8266 firmware to detect abnormal acceleration using an MPU6050 sensor and trigger emergency workflows.
- Built a FastAPI backend to process telemetry and send emergency email alerts with live location.
- Integrated embedded hardware, backend APIs, and a mobile app into an IoT emergency alert system.

NanoBook — Grounded RAG System for Technical Knowledge | Next.js, TypeScript, Qdrant, LangChain

Dec 2025

- Built a Retrieval-Augmented Generation pipeline using semantic search and vector embeddings to ground LLM responses.
- Integrated Qdrant vector search with LangChain and OpenAI APIs to reduce hallucinations on technical queries.
- Implemented document chunking and embedding strategies to improve retrieval relevance and response quality.

Blog Platform — Full-Stack Blogging Platform | Next.js 14, TypeScript, MongoDB, NextAuth

June 2025

- Developed a full-stack blogging platform using Next.js 14 App Router, MongoDB, and NextAuth with Google OAuth.
- Implemented React Server Components, hybrid rendering, markdown editing, and optimized database queries using Mongoose.
- Designed the application using React Server Components and client components to improve performance.

Technical Skills

Languages: C, C++, Python, Java, TypeScript, SQL

Frameworks & Libraries: Next.js, React, Node.js, Express.js, FastAPI, NumPy

AI & Machine Learning: Neural Networks, Retrieval-Augmented Generation (RAG), Vector Search, LLM APIs

Databases: PostgreSQL, MongoDB, MySQL, SQLite, Qdrant

Tools & Technologies: Git, GitHub, Docker, Linux, REST APIs, Embedded Systems

Education

Ganpat University

Aug. 2024 – Present

Bachelor of Technology in Computer Engineering | GPA: 8.59/10

Mehsana, Gujarat

Achievements

- 2nd Place – Convergence 2026 Hackathon (Smart Helmet Emergency Detection System)
- GitHub Foundations Certified
- Google Cloud Study Jam 2025