Alok Kulkarni

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Final-year CSE student who builds systems and full-stack software and is comfortable working on Linux. Wrote a VPN protocol from scratch that runs on a Raspberry Pi, and has shipped client apps as a freelancer since 2024.

Education

Dr. Vishwanath Karad MIT World Peace University — Pune, India
B.Tech. Computer Science and Engineering — *2023 – 2027*

Coursework: Computer Networks, Operating Systems, DBMS, Cyber Security, Cloud Computing, Machine Learning

Experience

Freelance Software Developer — Pune, India
Self-employed, mobile & web — *2024 – Present*

- Delivered **3 Flutter apps** for small businesses from the first client call to launch, owning the **backend, database and hosting** on most of them.
- Built business websites in **Next.js** and **Tailwind**, including one for a manufacturing company, and wrote the site copy where clients had none.

Projects

Custom VPN with ML Anomaly Detection | *Python, Cryptography, Raspberry Pi, Android* — *Capstone, in progress*

- Wrote the handshake from scratch on **X25519** and **ChaCha20** (no WireGuard underneath), benchmarked on a **Raspberry Pi 3B**; rotates keys every 2 minutes.
- Traced a CPU bottleneck in the live tunnel to per-packet **ML** stats and moved that work into a separate process.

Security Alert Triage Agent | *Python, Ollama (Qwen3 4B), FastAPI, Docker* — GitHub

- Built an **LLM agent** that triages security alerts on a free local model, using log search, IP reputation, asset lookup and **MITRE ATT&CK** tools. Scored against a rule-based SOAR baseline on 18 labelled incidents.
- Rejects reports citing evidence it never retrieved, only proposes actions for a named analyst to approve (with an **audit log**), and is tested against a **prompt-injection** attack.

Stockroom, Inventory App | *C#, ASP.NET Core MVC, EF Core, SQL Server, JavaScript* — GitHub

- Multi-location inventory on **SQL Server** with an append-only stock ledger, **check constraints** against negative stock, and a **concurrency token** so two users can't sell the last unit twice.
- A **REST/JSON API** the pages call from JavaScript to update the DOM, and **29 xUnit** unit and integration tests in GitHub Actions CI.

Factory Monitoring Platform | *Next.js, TypeScript, PostgreSQL, Electron, Flutter*

- Turned live machine readings from **edge gateways** into alarms, work orders, lockouts and **OEE / MTTR** reporting, served to web, **Electron** desktop and **Flutter** clients from one **PostgreSQL** backend.
- Designed tiered roles with per-user permission overrides, a full **audit log**, and read-only **API keys** scoped per client.

Kharcha, Personal Finance App | *Flutter, Dart, Riverpod, drift/SQLite, Supabase* — GitHub

- Built an **offline-first** Android app that turns bank and UPI SMS into transactions, reads receipts with on-device **ML Kit** OCR, and tracks budgets and recurring payments.
- **SQLite** as the source of truth with optional **Supabase** sync through an outbox; **85 tests** run in CI.

Torvik Engineering Website & Gear Configurator | *three.js, TypeScript, Astro, GSAP* — Live demo

- Wrote a procedural **three.js** gear generator from real involute geometry, used for a scroll-driven 3D marketing site (**GSAP**, static **Astro** build).
- Built a **parametric configurator** on it: users change teeth, module, width, helix and bore, see the gear rebuild in real time, and download it as print-ready **STL**, **OBJ** or **GLB**.

Technical Skills

Languages: Python, TypeScript, JavaScript, C#, Dart, Java, C, SQL
Frontend & Mobile: HTML, CSS, React, Next.js, Tailwind CSS, Astro, three.js, Flutter, Electron
Backend & Data: Node.js, FastAPI, ASP.NET Core MVC, EF Core, REST APIs, PostgreSQL, SQL Server, MySQL, Firebase, Supabase
AI & ML: LLM agents, PyTorch, Ollama, Gemini API, OpenAI API, scikit-learn, Pandas
Systems & IoT: Linux, TCP/IP, MITRE ATT&CK, cryptography (X25519, ChaCha20), Raspberry Pi, ESP32, MQTT
Tools: Git, Docker, CI/CD (GitHub Actions), unit and integration testing (xUnit, Vitest), Claude Code