# Vedant Shende

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## Education

**Birla Institute of Technology, Mesra** Aug. 2024 – May 2028
*B.Tech in Electrical and Electronics Engineering* ***CGPA: 8.78/10*** *Ranchi, Jharkhand*

## Experience

**Neo Labs** Apr. 2026 – Jun. 2026
**Backend Developer Intern** | *TypeScript, Node.js, PostgreSQL, Redis, BullMQ, Azure Blob Storage* *Remote*

- Architected a real-time OpenAI financial circuit breaker across API and worker nodes using Redis atomic evaluation (`MULTI/LUA`); enforced per-user and global daily hard caps that mitigated runaway embedding loops, protecting production budgets from uncapped LLM costs.
- Resolved a silent-failure gap across 7 production workers where jobs exhausting retries vanished without a trace; implemented a standardized dead-letter-queue handler with audit logging, restoring failure visibility platform-wide.
- Built an asynchronous data-export pipeline generating user data as JSON/PDF, uploading to Azure Blob via SAS-signed URLs, and triggering push/in-app notifications on completion via a shared FCM/APNs dispatcher.
- Devised a two-step direct-to-blob audio upload flow (client-side SAS PUT, server-side confirm) with size-spoofing protection and mime validation, wiring successful uploads into the transcription pipeline.

## Projects

**Code Execution Engine** | Live | GitHub
*Node.js · TypeScript · Express · PostgreSQL · Redis · BullMQ · WebSockets · Docker · AWS EC2 · Nginx*

- Designed a distributed, sandboxed execution platform with a pre-warmed container pool, cutting sandbox startup time by 99% (8ms vs. 2s cold start) and reducing runtime latency to <230ms.
- Implemented a fault-tolerant job lifecycle using BullMQ and Redis to enforce a deterministic state machine, with self-healing DLQ routing and exponential backoffs for recovery across worker crashes.
- Developed a real-time observability pipeline using Redis Pub/Sub and WebSockets to stream stdout/stderr logs and execution traces live to the client interface.
- Orchestrated a 4-service architecture with Docker Compose and provisioned cloud deployment on AWS EC2 behind an Nginx reverse proxy with streamlined CI/CD via GitHub Actions.

**Niyantran** | Live | GitHub
*Node.js · TypeScript · Express · PostgreSQL · Redis · BullMQ · WebSockets · Docker · AWS EC2 · Nginx · Groq · Mappls API*

- Engineered a real-time traffic simulation on a 294-junction road graph using weighted BFS with time-of-day cascade multipliers to dynamically compute optimized fleet dispatch and barricade plans per event.
- Assembled an async Node.js backend with WebSockets, Redis Pub/Sub, and BullMQ to broadcast 30-second simulation ticks and live spatial telemetry to connected clients with sub-second delivery.
- Integrated Groq LLMs, Mappls API, and Twilio (WhatsApp) for routing and alerts, designing a multi-layer deterministic fallback — rule-based plans on Groq failure, haversine routing on Mappls outage — ensuring continuous routing under simulated third-party outages.
- Containerized a 5-service stack with Docker Compose, deployed to AWS EC2 with Nginx reverse proxy for WebSocket upgrading, and configured via GitHub Actions CI/CD gating on all service builds.

## Technical Skills

**Languages** : TypeScript, JavaScript, C++, Go (learning)
**Backend** : Node.js, Express.js, BullMQ, Prisma, WebSockets
**Databases** : PostgreSQL, Redis, MongoDB, Supabase
**Frontend** : React, React Query, HTML5/CSS3
**DevOps** : Docker, AWS (EC2), Azure Blob Storage, Nginx, GitHub Actions, Linux, Kubernetes (learning)
**Tools** : Git, Postman, Vercel, Render

## Achievements

**G.P. Birla Scholarship (2x)** – Awarded twice for outstanding academic performance at BIT Mesra.

**Branch Topper** – Ranked 1$^{st}$ in the Electrical & Electronics Engineering branch in Semester 1.

**DSA** – Solved 400+ problems across LeetCode and TUF+.

**Flipkart Gridlock 2.0** – Qualified for Round 2 out of 4,500+ competing teams in Flipkart's national-level AI traffic management challenge.