

# Rahul Jha

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## Technical Skills

**Languages:** TypeScript, JavaScript, Python, SQL, HTML, CSS

**Frameworks:** React.js, Next.js 14, Node.js, FastAPI, Tailwind CSS, REST APIs

**Databases:** PostgreSQL, PostGIS, Supabase, MongoDB, SQLite, Firebase Firestore

**Tools:** Git, Docker, Cloudflare Pages, Vercel, FAISS, Google Maps API, FCM, CI/CD

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## Work Experience

**Full Stack Developer — JRL**

December 2025 – February 2026

*Next.js 14, Firebase (Firestore, Functions, FCM), Google Maps API, IoT GPS, Tailwind CSS*

- Delivered a **production fleet management platform** for a petroleum transport company, actively used by **45+ logistics clients** to coordinate **11 tankers across North India**, replacing manual phone-based tracking.
- Engineered live truck telemetry by integrating **IoT GPS devices** with Firebase Realtime Database, rendering position, speed, and route history on Google Maps with **5-second refresh cycles**.
- Built **geofence-aware smart lock control** using the Haversine formula, with tamper events firing **FCM push alerts in under 2 seconds** and a per-truck audit log for dispute resolution.
- Architected an **event-driven alert pipeline** for offline detection, speed violations, and geofence breaches, secured by **role-based access control** across operator, dispatcher, and admin tiers.

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## Projects

**STRIDE — Real-Time Geospatial Territory Platform**

[Live](#) | [GitHub](#)

*Next.js 14, TypeScript, Supabase, PostgreSQL, PostGIS, Cloudflare Pages*

- Engineered a spatial game engine on **PostGIS** that captures running loops as **GEOGRAPHY polygons** and clips overlapping rival territory via **ST\_Intersects + ST\_Difference** inside a **single-transaction RPC**, eliminating race conditions on concurrent captures.
- Designed a **6-table RLS-enabled schema** with **Supabase Realtime** channels broadcasting territory updates without polling, plus a cron-driven Edge Function that shrinks undefended ground **10% every 48 hours**.
- Shipped an installable **PWA** on the **Cloudflare Edge runtime** with a **VAPID Web Push** pipeline, delivering theft and streak alerts to subscribed devices via a Supabase Edge Function.

**Civik — AI-Powered Civic Issue Reporting Platform**

[Live](#) | [GitHub](#)

*Next.js 14, TypeScript, Supabase, Gemini 2.0 Flash, HuggingFace BART, Vapi*

- Deployed a **multi-modal reporting pipeline** (photo, text, voice) currently used on the **Bennett University campus** to log and route infrastructure issues, with **Gemini 2.0 Flash** auto-extracting title, category, and urgency from a single image.
- Built a **two-stage AI verification gate**: Gemini rejects non-civic reports before insert, then **BART-large-MNLI zero-shot classification** ranks the feed by  $0.7 \times \text{urgency} + 0.3 \times \log(1 + \text{upvotes})$  so safety-critical issues stay visible without upvotes.
- Engineered a **7-role RBAC system** at the edge middleware layer over **26 Supabase migrations** and **~30 API routes**, with voice reporting in **10+ Indian languages** via Vapi and the Web Speech API.

**RediSearch — Hybrid Search Engine over Reddit Data**

[GitHub](#)

*Python, FastAPI, SQLite (WAL), FAISS, sentence-transformers, pytest*

- Engineered a **three-index hybrid retrieval system** combining a custom **shard-aware BM25** inverted index, a **TF-IDF** sparse matrix, and a **FAISS vector index** over **all-MiniLM-L6-v2** embeddings, fused via a tunable weighted  $\alpha$  parameter.
- Designed a **subreddit-partitioned** pipeline (crawler  $\rightarrow$  raw store  $\rightarrow$  versioned preprocessor  $\rightarrow$  indexers) on **SQLite WAL**, enabling shard-pruned queries and full reindexing without touching immutable raw data.
- Built a **FastAPI** server with **cursor-based pagination** ( $O(1)$  resume, stable ordering), **trie autocomplete**, token-bucket rate limiting, and a SQLite-backed job queue with retry and stale-job recovery, validated by a **pytest** suite.

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## Education

**Bennett University, Greater Noida**

September 2023 – June 2027

B.Tech in Computer Science and Engineering

CGPA: **8.1**

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## Achievements

**Winner — Tech Arena 2025** 1st place among **60+ teams** (VASUNDHARA, AI waste management)

**AIU Anveshan 2025** National Round Selectee

**OpenAI x NxtWave Hackathon** National Finalist