

ANIRUDH SARVE

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PROFESSIONAL SUMMARY

Full-Stack Software Engineer with strong expertise in TypeScript, React, Next.js 16, Node.js, and high-concurrency distributed systems. Proven track record in building production web applications, edge-computed WebAssembly workflows, real-time WebSocket state management, and atomic database ledgers. Experienced across both fast-paced startup environments and complex architectural monorepos, translating complex user journeys into sub-second, fault-tolerant web applications.

EDUCATION

Vidyalankar Institute of Technology (VIT), Mumbai — B.E. in Computer Engineering Expected May 2028

Cumulative GPA: 8.90 / 10.0 | Affiliated with University of Mumbai

Relevant Coursework: Data Structures & Algorithms, Object-Oriented Programming, Database Management Systems, Operating Systems, Web Technologies, Computer Networks, Software Engineering.

Sonopant Dandekar Shikshan Mandali — HSC (Class XII, PCMB) May 2024

Score: 92.60% | Distinction in Mathematics, Physics & Computer Science

TECHNICAL SKILLS

Languages: TypeScript, JavaScript (ES6+), Python, Java, C++, SQL, HTML5, CSS3.

Frontend: Next.js 16 (App Router, Server Components), React 19, Tailwind CSS, Redux Toolkit, WebAssembly (WASM), WebGL, Tiptap, Responsive Design.

Backend & APIs: Node.js, Express.js 5, FastAPI, RESTful APIs, GraphQL, WebSockets (Socket.io, Ably), Server-Sent Events (SSE), Model Context Protocol (MCP).

Databases & Caching: MongoDB (Mongoose, Geospatial), PostgreSQL, MySQL, Supabase, Upstash Redis (Distributed Locks), Qdrant.

DevOps & Tools: Docker, Git, GitHub Actions, Turborepo, pnpm, Cloudinary, AWS (EC2, S3), Google Cloud Run, Vercel, Linux.

PROFESSIONAL EXPERIENCE

NxtChaptr — Software Developer (Full-Stack & Edge Infrastructure) Nov 2024 – Aug 2025

- Engineered full-stack web applications for an omnichannel recommerce marketplace, architecting high-throughput REST APIs and responsive Next.js storefronts supporting thousands of campus users.
- Implemented client-side edge computer vision via **WebAssembly and WebGL** (U²-Net), enabling background removal directly in the seller's browser in under **3.5 seconds** and eliminating server-side cloud GPU computing expenses.
- Eliminated race-condition double purchases during live high-traffic event drops by architecting atomic distributed locking using **Upstash Redis (SET NX EX 120)** coupled with real-time **Ably WebSockets**.
- Automated logistics reconciliation pipelines by integrating Shiprocket REST APIs, dynamically calculating volumetric weight tariffs and securing automated margin tracking per shipment.
- Built automated listing generation using Google Gemini Vision, reducing merchant product upload duration from 8 minutes to under 30 seconds.

Exposure: Next.js, React, Node.js, Express, Upstash Redis, WebAssembly, MongoDB, Cloudinary, Shiprocket APIs.

Wroomie — Software Developer (Full-Stack & Backend) Nov 2023 – Jan 2024

- Built end-to-end features for a roommate and housing discovery platform, developing responsive user interfaces in Next.js and RESTful microservices in Node.js/Express.
- Designed 4-axis multi-attribute lifestyle compatibility clustering algorithms (sleep rhythm, cleanliness standards, dietary choices, social preferences), achieving a **94% user match satisfaction rate**.
- Implemented rich collaborative lease agreement creation utilizing the **Tiptap rich-text editor** and integrated Cloudinary SDK for real-time asset optimization and image moderation.
- Optimized MongoDB geospatial queries with 2dsphere indexing, reducing room search latency by **35%** for location-based queries across university campuses.

Exposure: Next.js, Node.js, Express, MongoDB, Geospatial Indexing, Cloudinary, Tiptap.

FEATURED TECHNICAL PROJECTS

High-Concurrency Distributed Marketplace Engine with Client-Side WASM Edge Matting & Redis Locks

Technologies: Next.js 16, Upstash Redis, WASM, Ably

- Engineered an omnichannel e-commerce platform combining on-device computer vision and atomic distributed concurrency primitives to power live, scarcity-driven event stall drops.
- Integrated client-side U²-Net background matting via WebAssembly/WebGL compiling to zero-cost edge execution in <3.5s per image, bypassing server-side GPU costs.
- Architected Redis distributed locks (SET key val NX EX 120) on top of single-threaded in-memory storage, resolving concurrent checkouts in <5 ms and guaranteeing zero race-condition overselling.

Neuro-Symbolic Hybrid Retrieval Engine & Automated Standards Compliance Platform (SIH PS 26108)

Technologies: React 18, TypeScript, FastAPI, SQLite FTS5, PaddleOCR

- Architected an intelligent regulatory compliance platform for the Bureau of Indian Standards (BIS) and GeM procurement portal, automating tender compliance across 19,423 national standards.
- Designed a 3-way hybrid retrieval engine fusing SQLite FTS5 BM25 lexical search, exact IS regex matching, and 384-dimensional dense ONNX embeddings via Reciprocal Rank Fusion (RRF).
- Implemented a zero-hallucination verification kernel cross-referencing 2,257 official Gazette Quality Control Orders (QCOs), paired with a PaddleOCR v2.9+ pipeline achieving 99.28% OCR confidence on scanned tender BoQ tables.

Autonomous Multi-Agent DAG Orchestration Platform with Hash-Verified Citation Kernels

Technologies: Next.js, TypeScript, FastAPI, Qdrant, SSE

- Built an autonomous multi-agent research platform decomposing academic literature discovery, vector-chunk ingestion, cross-claim verification, and report synthesis into an isolated agent DAG.
- Developed an interactive dual-pane Next.js workspace featuring live agent telemetry streams via Server-Sent Events (SSE) and clickable citation tags resolving directly to verified source chunk hashes in Qdrant.
- Integrated federated paper ingestion across ArXiv, PubMed, and OpenAlex APIs, vectorizing thousands of full-text papers with dense embeddings at sub-millisecond retrieval latency.
- Implemented deterministic claim-verification pass pruning unlinked claims, guaranteeing zero hallucinated citations in generated IEEE-formatted literature reviews.

Sub-150ms Vector Graphics Stream PDF Compiler & Model Context Protocol (MCP) Server Monorepo

Technologies: TypeScript, Turborepo, Rust Canvas, Zod

- Engineered a high-performance resume engine compiling live-editable schemas into raw vector PDF streams in **under 150 ms** using Rust-native canvas bindings, consuming <40 MB RAM (an **88% memory reduction** vs headless Puppeteer).
- Implemented a native Model Context Protocol (MCP) server over standard I/O, exposing structured resume CRUD tools with strict Zod validation for autonomous AI agent control.
- Built a self-healing parsing middleware integrating jsonrepair to automatically validate, sanitize, and patch corrupted agent outputs before schema ingestion into PostgreSQL.

ACID-Compliant Distributed Multi-Warehouse Inventory Ledger with Connection Pooling & 2FA

Technologies: Node.js, Express 5, MySQL2, Nodemailer, JWT

- Architected a modular multi-warehouse inventory management ledger handling concurrent stock receipts, dispatches, and inter-facility transfers with zero inventory discrepancy.
- Enforced strict ACID transactional isolation (START TRANSACTION ... COMMIT) over MySQL connection pools, eliminating negative inventory anomalies under simultaneous dispatch attempts.
- Implemented mandatory two-factor email OTP authorization (Nodemailer) for high-value stock adjustments, accompanied by immutable audit logging and role-based access control (RBAC).

ACHIEVEMENTS & CONTRIBUTIONS

- **Open-Source & Monorepo Development:** Contributed to modular TypeScript monorepos (Turborepo, pnpm) and public developer tools.
- **ISRO Smart India Hackathon (SIH 2026):** Core architect for PS 26168, developing real-time browser telemetry visualization canvases alongside high-performance edge algorithms.
- **Academic Distinction:** Secured 8.90/10.0 CGPA at VIT Mumbai and 92.60% in HSC Board Examination.