

Vishal Singh

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EDUCATION

Indian Institute of Information Technology, Nagpur

Bachelor of Technology in Computer Science & Engineering

Nagpur, India

Expected Aug 2027

- **Relevant Coursework:** Data Structures & Algorithms, Object-Oriented Programming, Database Management Systems (DBMS), Operating Systems, Computer Networks, Distributed Systems, Software Engineering

PROFESSIONAL EXPERIENCE

Head of Development

CRISPR IIIT Nagpur

Aug 2024 – Present

Nagpur, India

- Directed the development of full-stack applications addressing institutional needs; owned requirements gathering, system design, deployment, and maintenance
- Mentored junior developers and enforced Git workflows, code reviews, and testing standards
- Established CI/CD pipelines and maintained production systems
- **Technologies:** React.js, Node.js, Express, PostgreSQL, MongoDB, Docker

PROJECTS

Lekha: High-Performance SME Ledger | *SwiftUI, SwiftData, Vision* | [GitHub](#)

- Constructed a zero-dependency, offline-first iOS application utilizing the MVVM-C and Repository patterns, built entirely with native Apple frameworks
- Engineered a custom Trie-based indexing engine from scratch, optimizing prefix search latency for 5,000+ records to **~0.5ms** (a 20x speedup) with **$O(k+m)$** time complexity
- Implemented thread-safe transaction processing using Swift Actors (**@ModelActor**), achieving **$O(1)$** financial balance lookups through a denormalized SwiftData caching strategy
- Incorporated the Vision framework for on-device OCR text extraction and validated core business logic with a robust 61-test suite, achieving a **35% test-to-source code ratio** with zero test failures

NoteCode: Chrome Extension | *JavaScript, Google Apps Script* | [Web Store](#) | [Demo](#)

- Shipped a feature-rich Chrome extension with **60+ active users**, owning the end-to-end product lifecycle from development to deployment
- Integrated a Google Apps Script backend with the Google Sheets API for automated note syncing and data management

Mercari Clone: AI E-Commerce | *SwiftUI, Node.js, PostgreSQL, Docker* | [GitHub](#)

- Architected a microservices-driven e-commerce platform using Docker, seamlessly linking a native SwiftUI iOS client with a Node.js backend and a PostgreSQL database via Prisma ORM
- Developed a Python/FastAPI microservice to deliver AI-powered dynamic pricing recommendations, consumed by the iOS frontend utilizing Swift's modern **async/await** concurrency model
- Deployed a low-latency, bidirectional buyer-seller messaging architecture using WebSockets (Socket.io), and fortified all REST API endpoints with secure JWT authentication
- Enforced strict MVVM design patterns within the iOS application, leveraging the Combine framework to isolate network layers and ensure deterministic, reactive UI state management

Fintech Idempotency Middleware | *TypeScript, Node.js, Redis, PostgreSQL* | [GitHub](#) | [npm](#)

- Published an enterprise-grade npm package providing exactly-once execution guarantees for critical REST APIs in distributed systems
- Designed pluggable Redis and PostgreSQL storage adapters using extensible software design patterns including Factory and Strategy
- Achieved 43k+ requests/second on cached retries with p99 latency under 8 ms; validated via an extensive Jest test suite

TECHNICAL SKILLS

Languages: Swift, Rust, JavaScript, TypeScript, Python, C++, Java, SQL, HTML5, CSS3

Frontend & Mobile: iOS Development (SwiftUI), React.js, Next.js, Tailwind CSS, Xcode

Backend Technologies: Node.js, Express.js, REST APIs, Microservices Architecture, API Design

Databases: PostgreSQL, MySQL, MongoDB, Redis, Database Design, Query Optimization

DevOps & Tools: Git, GitHub, Docker, CI/CD, Jest, npm, Vercel

Core Concepts: Data Structures & Algorithms, System Design, Object-Oriented Programming, Machine Learning, TDD

ACHIEVEMENTS

Technical Authorship | Authored comprehensive "Zero-to-Hero" LaTeX textbooks on Rust and Dynamic Programming

C.R. Rao Statistics Olympiad | All India Rank 5

Amazon ML Challenge (2025) | Ranked 262 out of 7000+ teams

Silicon Maze (NITK) Hackathon | Rank 3 Overall (Web Dev, CP, CTF); Rank 1 in Competitive Programming

Competitive Programming | 3-Star CodeChef (Max Rating: 1648); Pupil Codeforces (Max Rating: 1301)