

Rajkumar Choudhury

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EXPERIENCE

Software Engineer

Indian Institute of Technology (BHU)

July 2025 – Present

Varanasi, India

- Developed end to end features for a Decision Support System using **FastAPI**, **Next.js**, **PostgreSQL**, **GeoServer**, **Redis**, and **Celery**, delivering five environmental analysis modules for river rejuvenation planning.
- Built an analytics pipeline using **DuckDB** to process and compress over **90 million records**, reducing dataset size from **1.3 GB to 87 MB** and enabling low-latency frontend analytics.
- Built a retrieval augmented AI assistant using **ChromaDB**, implementing context aware conversation retrieval and prompt validation to constrain responses to verified weather and regional datasets.
- Optimized API responsiveness by introducing asynchronous background processing with **Celery** and caching through **Redis**, reducing latency from **5 seconds to under 200 ms** and improving frontend responsiveness.
- Implemented a media processing pipeline that transcodes videos into **3 adaptive quality variants** while replacing legacy polling with bi-directional **WebSockets** for real-time dashboard updates.
- Prepared geospatial datasets using **ArcGIS** for spatial validation and published raster and vector datasets through **GeoServer** for interactive web visualization.

Software Engineer

Thinkcraft Technologies

Sept 2024 – June 2025

Remote

- Delivered scalable full stack features for an e-commerce platform using **Node.js** backend services and **React.js** frontend components.
- Integrated secure **OAuth 2.0** authentication (Google/Apple), reducing average user onboarding and login time by **40%**.
- Modeled relational database schemas using **Prisma ORM** and **PostgreSQL**, enforcing referential integrity through normalized relationships and database constraints.

PROJECTS

VideoTube (Media Streaming Platform) | Node.js, Express.js, MongoDB, JWT, Cloudinary

Feb 2026

- Built a media sharing backend using **Node.js** and **Express.js**, designing **MongoDB** schemas to manage videos, comments, likes, and channel subscriptions.
- Implemented JWT-based authentication with access and refresh token rotation, alongside **Bcrypt** password hashing to secure API endpoints.
- Built a resilient media upload pipeline utilizing **Multer** for local file buffering and **Cloudinary APIs** for the optimized cloud storage, serving, and formatting of heavy user-generated video files.
- Optimized database queries by writing advanced **MongoDB aggregation pipelines** to efficiently compute dynamic user statistics, such as comprehensive watch histories and aggregated subscriber metrics, preventing data bottlenecks.

TECHNICAL SKILLS

Languages: Java, JavaScript (ES6+), TypeScript, Python

Full Stack Frameworks: FastAPI, React.js, Next.js, Node.js, Express.js

Backend & System Design: Event-Driven Architecture, Celery, Redis, WebSockets, REST APIs

Database: PostgreSQL, MongoDB

Tools & Platforms: Docker, Git, Linux

EDUCATION

Banaras Hindu University (BHU)

Master of Computer Applications (CGPA: 7.925)

Varanasi, India

Nov 2022 – Sept 2024

Rajdhani College, Delhi University

B.Sc. Computer Science (CGPA: 8.712)

New Delhi, India

Aug 2019 – May 2022