

# Sumit Kumar

4th Year Undergraduate

Department of Computer Science and Engineering

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in Sumit Kumar SumitKumar-17

## Academic Qualifications

Year	Degree/Certificate	Institute	CGPA/%
2022 - Present	5 year Dual Degree Course(BTech. + MTech.) in Computer Science	Indian Institute of Technology, Kharagpur	8.73/10
2022	Class XII (CBSE)	Delhi Public School, Kalyanpur	94.20%
2020	Class X (CBSE)	Delhi Public School, Kalyanpur	96.60%

## Work Experiences

System Architecture and Platform Design - Spring Fest

Jul'24-Apr'25

- Scaled backend for **100M+ API requests** by deploying with **Nginx**, **Redis caching** on **4 AWS EC2 t3.large** instances
- Handled **80L+ transactions** by integrating **PhonePe API**, authentication using **JWT**, **OAuth2** and **rate-limited endpoints**
- Delivered **99.8% OTP/email delivery** using **MSG91**, **Mailer**, **async retry queues** and monitoring through **CloudWatch**
- Shipped **React Native app** on **Play Store (1K+ downloads)** with backend integration for **event access** and **admin tools**

Software Developer Intern - Paralleldots

Dec'24-Jan'25

- Improved **Android render speed** by **25%** and cut **cold start** by **~3.2s** via **ViewModel**, **lazy loading**, and **UI refactors**
- Reduced **upload failures** by **~20%** using **S3** for **resumable uploads** with **Cognito-secured** access and **retry logic**
- Cut **invalid scans** by **~18%** using a **SQLite-backed local queue** with **WorkManager** sync triggered by network connectivity
- Lowered **API load** by **~10%** by **caching task history**, enabling instant access and reducing backend calls after reconnect

## Projects

KeystoneDB

Mar'25 - Apr'25

- Built a **lightweight RDBMS** in **C++** with an **SQL parser** using **Flex** and **Bison** and **persistent storage** by **RocksDB**
- Implemented **modular query execution** supporting **15+ SQL operations** over **LSM-tree** with **transaction handling**
- Developed a **custom key-value storage layer** using **RocksDB**, ensuring **durability** and **correctness** for **SQL operations**
- Added **70+ unit tests** with **Google Test** to verify **parsing accuracy**, **transaction consistency**, **safe concurrent execution**

Conversational AI Platform for Employee Welfare

Feb'25 - Mar'25

- Built **AI-driven system** to monitor **employee well-being** by **behavioral signals**, **automated insights**, **LLM pipelines**
- Processed data from **1K+ users** using a **multi-stage pipeline** with **FastAPI**, **CRON jobs**, and **performance metrics**
- Flagged **high-risk users** with **42% improved accuracy** using **EMA-weighted scores** and **ensemble models**
- Orchestrated **LLM-powered chatbot** and **summaries** via **LangChain pipelines**, enabling **context-aware insights**

Gram Panchayat System

May'25 - Jul'25

- Developed a **web app** to streamline processes, including **citizen registration**, **scheme enrollment**, and **grievance tracking**
- Integrated **SendGrid API** to automate **email notifications** for **application confirmations**, **status updates**, and **reminders**
- Implemented **secure file upload/download** using **DigitalOcean Spaces** with proper **access control** and **activity logging**
- Designed **RESTful APIs** with **ExpressJS** and managed **PostgreSQL queries** for **tracking**, **workflows**, **status reporting**

## Skills & Expertise

- Programming Languages:** C/C++, Rust, Go, Elixir, Python, TypeScript, JavaScript, Bash, Awk, Verilog, SQL
- Libraries and Frameworks:** React, Next.js, React Native, Node.js, Express, Pandas, NumPy, GraphQL, Prisma, Django, Flask
- Tools/Platforms:** Docker, Kubernetes, Redis, MongoDB, Postgres, AWS, Azure, Git, Databricks, Linux Kernel, Raspberry Pi

## Relevant Courses

- Computer Science:** Programming and Data Structures, Algorithm-I, Software Engineering, Computer Organization and Architecture, Compilers, Database Management Systems, Operating Systems, Computer Networks
- Mathematics:** Advanced Calculus, Linear Algebra and Numerical and Complex Analysis, Probability & Statistics, Discrete Structures, Formal Language and Automata Theory
- More Courses:** Basic Electronics, Switching Circuits and Logic Design, Machine Learning, Data Analytics

## Awards and Achievements

- Secured **AIR 2038** in JEE Advanced and **1870** in JEE Mains (1.2M candidates) in 2022.
- Contributed to the NixOS open source project by writing **patches**, refining **Nix expressions**, and improving **system builds**
- Served as the Unit Leader for NSS Unit-4, coordinated activities, and received the **Best Volunteer Award**