

ABHISHEK KUMAR

Khurja (Bulandshahr), Uttar Pradesh, India (open to relocation)

 [Portfolio](#)  [DSA Profile](#)  +91 8791981509  abhi3122004ak@gmail.com  [Linkedin](#)  [Github](#)

Education

Indian Institute of Information Technology Sonapat **Aug 2023 - Expected May 2027**
Bachelor of Technology in Computer Science and Engineering (CGPA 8.53) *Sonipat, Haryana*
• **Relevant Coursework:** Data Structures & Algorithms, Operating Systems, Database Management Systems, Computer Networks, Object Oriented Programming, Software Engineering, Machine Learning, Artificial Intelligence

Experience

Software Engineering Intern **Jun 2026 - Aug 2026**
KrakenNet *Remote*
• Replaced an **LLM**-based adjudicator in a **Python** rule-validation pipeline (**nautilus**) with a deterministic **fail-closed decision ladder**, using rule provenance to auto-retire superseded rules.
• Refactored **CLI** error handling across a **FastAPI** codebase into shared exception paths, validated on a **CI matrix** spanning **Python 3.13/3.14** across **Linux** and **macOS** under strict type checking.

Research Intern **Aug 2025 - Dec 2025**
Indian Institute of Information Technology Sonapat *Sonipat, Haryana*
• Researched **Wavelet Physics-Informed Neural Networks (PINNs)** and **Fourier Neural Networks**, applying both to stiff singularly perturbed differential equations.
• Benchmarked **L-BFGS** and **Adam** optimizers with **adaptive meshing** to improve convergence, capturing extreme boundary layers at both interval endpoints.

Achievements and Awards

- Solved **1000+ DSA problems** across **LeetCode**, **Codeforces**, and **CodeChef** — optimized for time and space complexity.
- Rated **Knight on LeetCode (1900+)**, **Specialist on Codeforces (1500+)**, and **3 Star on CodeChef (1600+)**.

Projects

Scribe - RAG Documentation Assistant | *Python, FastAPI, React, ChromaDB, Live Demo* **May 2026 - Aug 2026**
• Built a **RAG** documentation assistant over **2,500+** crawled pages in **Python** and **FastAPI**, with **Groq (Llama 3.3 70B)** serving grounded answers at **sub-1s** latency.
• Raised recall@5 from **59.6%** to **80.8%** by combining **BM25** with dense retrieval and a **cross-encoder reranker**, measured on **recall@k**, **nDCG**, and **MRR**.

PrestoPass - High-Concurrency Ticketing | *FastAPI, Redis, PostgreSQL, Next.js, Live Demo* **Jun 2026 - Sep 2026**
• Guaranteed single-winner seat claims under contention via atomic **Redis SET NX EX** locks executed in **Lua**, holding **zero overselling** while **2,000** concurrent **k6** virtual users contended for **500** seats.
• Decoupled checkout with a **taskiq** payment worker and a **Redis** virtual waiting room streaming queue position over **Socket.IO**; root-caused the capacity ceiling to **SQLAlchemy** pool exhaustion.

TradeXchange - Low-Latency Order Book | *C++20, ZeroMQ, FastAPI, React, WebSockets* **Jul 2026 - Jul 2026**
• Implemented a **C++20** limit order book engine with **price-time priority** matching, where a lock-free, zero-allocation design sustains **2.6M+ inserts/sec** at **sub-microsecond p99** latency.
• Decoupled ingestion with **ZeroMQ PUSH/PULL** sockets and a binary wire protocol streaming packed **32-byte structs** to the **C++** core, with **64-bit Snowflake IDs** preventing order-ID collisions under load.

Certifications

- Full Stack Generative and Agentic AI with Python** | Udemy May 2026
- FastAPI Full Stack Mastery: Build, Test, Deploy** | Udemy Feb 2026
- Google Cloud Computing Foundations: Data, ML, and AI in Google Cloud** | Google Oct 2023

Technical Skills

Languages: Python, C++ (C++20), TypeScript, SQL
AI/ML: LLMs, RAG (Retrieval-Augmented Generation), LangChain, Vector Search, Embeddings, PyTorch
Backend & Systems: FastAPI, REST APIs, WebSockets, SQLAlchemy, Multithreading, Lock-Free Data Structures, ZeroMQ
Frontend: React.js, Next.js
Databases & Infrastructure: PostgreSQL, Redis, ChromaDB, Docker, AWS
Tools: Git, Pytest, k6