

Arpit Yadav

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EDUCATION

Axis Institute of Technology and Management

Bachelor of Technology (B.Tech) in Computer Science and Engineering

Coursework: Data Structures & Algorithms, Web Architecture, IoT Systems, Database Systems, Operating Systems.

Kanpur, UP

2025 – 2029

TECHNICAL SKILLS

- **Languages:** C, C++, Python, JavaScript, TypeScript, HTML5, CSS3, SQL.
- **Frameworks & Web:** React 19, Next.js, Node.js, Express, FastAPI, Tailwind CSS, Vite, Three.js, Web Audio API.
- **Databases & Tools:** MongoDB, SQLite (FTS5), Firebase, Git, GitHub Actions (CI/CD), Postman, VS Code, Linux/Unix, Docker.
- **Embedded & IoT:** ESP32, Arduino, FreeRTOS, FSM Architecture, Sensors/Actuators, I2C/SPI Protocols, GSM/GPS Modules.

SELECTED PROJECTS

Smart Helmet Telemetry & Ignition Interlock (SIH 2026)

ESP32, Embedded C++, FreeRTOS, MQ-3, SIM800L

- Engineered an end-to-end IoT safety system using **ESP32** and **Embedded C++** to enforce mandatory helmet wear and absolute sobriety via an automated **RF relay ignition interlock**.
- Integrated MQ-3 alcohol sensors and 6-axis IMU accelerometers with custom threshold filtering, reducing false-positive collision flags by **85%** and maintaining sub-second sensor polling.
- Programmed automated emergency telemetry via **SIM800L GSM/GPS modules**, transmitting exact geo-coordinates and high-G impact logs to emergency contacts within **2.5 seconds**.

SAFETY-FI 96X: Smart Kitchen IoT & 3D Digital Twin

Arduino, Python FastAPI, Three.js, WebSockets, FSM

- Architected an industrial-grade kitchen hazard monitoring platform pairing microcontroller sensor arrays with a real-time **Three.js 3D Cooktop Digital Twin** for spatial hazard visualization.
- Built a low-latency **Python FastAPI** and WebSocket telemetry pipeline, streaming continuous LPG gas concentration, thermal variance, and pantry load-cell data at **<150ms** latency.
- Implemented a **Finite State Machine (FSM)** architecture on embedded firmware to handle deterministic safety shutdowns during gas leakage anomalies.

ChronoFact 2.0: Multi-Agent Forensics & Verification Engine

React, Node.js, MongoDB, SQLite FTS5, NIST SHA-256

- Developed a full-stack fact-checking and digital forensics platform using **React, Node.js, and MongoDB**, orchestrating multi-agent verification workflows for automated claim cross-referencing.
- Implemented **NIST SHA-256** cryptographic hashing and Merkle Tree indexing to generate immutable audit trails for verified timeline events, aligning data integrity with BSA legal standards.
- Optimized backend full-text search indexing using **SQLite FTS5**, boosting complex query retrieval speeds by **42%**.

AI Hub: Unified AI Workspace & 3D Media Discovery Suite

React 19, TypeScript, Three.js, GLSL, Firebase

- Engineered a scalable media aggregation and AI workspace application indexing **130+ global streaming, music, and literature sources** under a single unified dashboard.
- Developed a hardware-accelerated 3D Helical Engine using **Three.js and custom GLSL shaders** with depth-of-field disc blur and 2x Retina supersampling, sustaining a smooth **60 FPS** render loop.

Monu Egg Center — Cloud Kitchen & Smart QR Suite

Firebase Firestore, Realtime Sync, Tailwind CSS, Vercel Edge

- Engineered a full-stack commercial web platform for a high-volume street kitchen featuring real-time menu synchronization and dedicated gym diet macro configurations.
- Integrated **Firebase Cloud Firestore** with secure role-based rules, automated Google Review rating funnel injection, and print-ready digital table QR ordering standees.

HONORS, CERTIFICATIONS & EXTRACURRICULARS

- **Smart India Hackathon (SIH) 2026 National Participant:** Designed and prototyped an enterprise-grade IoT Smart Helmet and ignition-safety telemetry system under rigorous national hackathon constraints.
- **Competitive Programming Problem Solving:** Solved **250+ problems** across LeetCode and GeeksforGeeks; earned official certification in the **GeeksforGeeks Code Catalyst** coding contest.
- **MongoDB Certified Developer Credentials:** Earned verified digital badges on Credly for **MongoDB Database Security** and **Student Basics**, mastering NoSQL schema design and data access security.
- **Cybersecurity Training Program (C3i Hub):** Completed specialized security training hosted by **C3i Hub** at AITM Kanpur, focusing on threat modeling and embedded network hardening.
- **Extracurriculars:** Registered participant in **Axis HackSprint 2.0** and sprint competitor in the **INFINITO 2K26** sports meet, balancing software development with competitive athletics.