Ayush Kumar

Roll No.: 1RF23CS041
Bachelor of Engineering
Computer Science & Engineering
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Portfolio Website
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Education

•RV Institute of Technology and Management *2027*
Bachelor of Engineering in Computer Science & Engineering CGPA till 4th Sem: 9.08

•Doon Public School, Dhanbad *2022*
Central Board of Secondary Education (CBSE) Percentage: 78.6%

•De Nobili School CMRI, Dhanbad *2020*
Indian Certificate of Secondary Education (ICSE) Percentage: 90.2%

Personal Projects

•GridPulse — F1 Race Analytics Platform *Dec 2025*

Built a full-stack race replay and telemetry visualization platform for real-time F1 analytics with live track positioning.

- Tools & technologies used: React, Vite, FastAPI, Python, FastF1, D3.js, Recharts, Axios, Tailwind CSS, Docker, Hugging Face Spaces
- Developed a RESTful API backend using FastAPI and the FastF1 library to process real F1 telemetry data (driver positions, lap times, pit stops, weather, team radio). Deployed on Hugging Face Spaces with Docker and intelligent caching.
- Built an interactive React frontend with D3.js track visualization, animated race replay controls, live leaderboards, sector time analysis, pit strategy panels, and podium displays all synchronized to 1-second telemetry data.
- Enabled real-time analysis of over **5,000+ telemetry datapoints per minute**, improving race replay insight and strategy visualization for end users.

•StockFlow Virtual Stock Trading Platform *Nov 2025*

Built a virtual trading platform with real-time prices, portfolio tracking, and competitive leaderboards.

- Tools & technologies used: React, Vite, Node.js, Express.js, PostgreSQL, Prisma ORM, JWT, Tailwind, Vercel.
- Built a RESTful API with 25+ endpoints for auth, trading, portfolios, and admin tools using Node.js/Express and JWT role-based access.
- Developed a responsive React frontend with 15+ reusable components real-time stock tables, trade modals, and dashboards—using React Router and Context API.
- Deployed backend as Vercel serverless functions and hosted PostgreSQL on Prisma Cloud with automated migrations, seeding, and live data sync.
- Achieved sub-100ms API latency on **real-time stock queries and supported 1,000+ simulated trades/day** during and real event with no API degradation.

•EventEase Event Management & Booking System *Oct-Nov 2025*

Built a full-stack event management and ticketing with secure payments, QR tickets, and admin dashboards.

- Tools & technologies used: React (Vite), Tailwind CSS, Node.js, Express.js, PostgreSQL (Prisma ORM), JWT Auth, Redis (BullMQ), Razorpay/Stripe, AWS S3, Puppeteer, Nodemailer.
- Developed end-to-end features for event creation, custom form building, attendee registration, secure payments, PDF ticket generation, and QR-based verification with HMAC signatures.
- Implemented a scalable backend with webhook-based payment confirmation, background job processing (BullMQ), and S3-based asset storage; built organizer dashboards for analytics, revenue tracking, and CSV exports.
- Built a responsive public-facing interface for event discovery, dynamic form submission, and seamless user checkout with email-delivered QR-coded tickets.
- Supported **secure, scalable bookings with automated ticketing** and background processing, enabling end-to-end event workflows with real-time verification.

•Text-Based Parkinson's Disease Screening using Pre-Trained LLM *July 2025*

Built a multimodal AI diagnostic system to detect Parkinson's Disease from clinical data with 96.73% accuracy

- Tools & technologies used: Python, PyTorch, Flask, Transformers (Hugging Face), PubMedBERT, BioGPT, Clinical-T5, LightGBM, XGBoost, SVM, CUDA 11.8, Pandas, Scikit-learn, NumPy, JavaScript
- Built a web-based diagnostic platform using multimodal machine learning ensemble to classify Parkinson's Disease into 4 categories (HC, PD, SWEDD, Prodromal). Combined 3 medical transformers (PubMedBERT, BioGPT, Clinical-T5) with 3 conventional ML models (LightGBM, XGBoost, SVM) through weighted voting, achieving **92.14% accuracy**. Trained on **42,645 PPMI patient samples** with 31 engineered features (demographics, motor symptoms, cognitive scores, non-motor indicators) . Implemented RAG system with medical research papers for evidence-based report generation with literature citations and clinical recommendations.

•FraudKavach — Real-Time Transaction Risk Scoring Engine *June 2025*

AI-driven fraud detection system for real-time transaction scoring and alerts.

- Tools & technologies used: React, TypeScript, Node.js, Express.js, Socket.IO, FastAPI, Python, LightGBM, SHAP, Docker.
- Built a real-time fraud detection pipeline with ML inference (LightGBM) for transaction risk scoring and WebSocket-based event streaming.
- Implemented explainable AI using SHAP to provide feature-level risk attribution for high-risk transactions.
- Developed a React dashboard for monitoring live transactions, risk scores, and alerts and containerized the platform using Docker Compose for seamless multi-service orchestration.

•Multimodal Sentiment Analysis of Public Opinion using Tweets *Apr 2025*

Built a sophisticated multimodal model to analyze public sentiment from text, images, and videos.

- Tools & technologies used: Python, TensorFlow/PyTorch, Hugging Face Transformers, Pandas, Scikit-learn, XGBoost, OpenCV, Librosa
- Established baseline performance on the text component using the Sentiment140 dataset (1.6 million tweets) with models including Naive Bayes and XGBoost. **Achieved 87.23% accuracy** on a curated dataset. Engineered advanced feature extraction pipelines, utilizing Large Language Models (BERT, RoBERTa) for nuanced textual analysis, CNNs for image features, and MFCCs for audio components.

Technical Skills and Interests

Languages: C, C++, Python, Java, HTML, CSS, JavaScript
Developer Tools: Git, Github, Linux, Canva, Docker
Frameworks: Pandas, PyTorch, NumPy, TensorFlow, Keras, scikit-learn, Tailwind, Node.js, Express.js
Cloud/Databases: MySQL, MongoDB, AWS, Google Cloud Platform
Soft Skills: Problem-Solving, Teamwork, Leadership, Time Management, Communication
Coursework: OOP, DBMS, Operating System, Computer Networks, DSA
Areas of Interest: Natural Language Processing, LLMs, SLMs, Deep Learning, RAG, Web3

Positions of Responsibility

–**Technical Head** Robotics, Web Dev, Cybersecurity, Coding and Entrepreneurship club *Fall 2025*
–**Events and Website Head** Core Organizing Committee, Techfest Robofiesta 2025 *2025*
–**Core Team Member** Robotics, Web Dev, Cybersecurity, Coding, GDG and Entrepreneurship club *2025-26*

Achievements

–**Codeforces Contest** Secured 12872th rank out of 52000+ participants worldwide, demonstrating strong problem-solving and algorithmic skills. *Dec 2024*
–**Competitive Programming** Active participant in competitive programming with ratings of 892 (Codeforces), 429 (AtCoder), and 1224 (CodeChef). *Ongoing*
–**Research Publication** "Optimizing Soybean Production: A Data-driven Machine Learning Framework." Journal of Research in Artificial Neural Network Systems, Vol. 1, Issue 3. *Sep-Dec 2025*
–**NPTEL Certificate** Intro to Large Language Models - IIT Delhi *Dec 2025*
–**NPTEL Certificate** Deep Learning IIT Ropar *May 2025*
–**Coursera Certification** Advanced Learning Algorithms - Deep Learning. AI (Stanford University) *Oct 2024*
–**Coursera Certification** Supervised Machine Learning: Regression and Classification - Deep Learning. AI (Stanford University) *Oct 2023*
–**Coursera Certification** Introduction to Front-end Development - Meta *Sep 2023*