

ARPIT KUMAR SINGH

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Summary

Full-Stack Developer with hands-on experience building scalable web applications, RESTful APIs, and microservices. Passionate about backend architecture, database design, and integrating AI into production systems.

Education

Dual Degree – B.Tech + M.Tech, Computer Science and Engineering

IIITDM Kancheepuram, Chennai, Tamil Nadu

Expected 2028

CGPA: 8.67 / 10*

Technical Skills

Languages: TypeScript, JavaScript, Python, C/C++, SQL

Frontend: React, Next.js, Tailwind CSS

Backend: Node.js, Express.js, FastAPI, REST APIs, WebSockets, Microservices

Databases: PostgreSQL, MongoDB, Redis, Supabase, Neo4j, Qdrant

Cloud & DevOps: AWS (EC2, S3), Docker, Git, Linux

AI Integration: LangChain, LangGraph, OpenAI API, Gemini, RAG

Experience

Freelance Full-Stack Developer

Jan 2025 – Present

Pod Gear (E-Commerce & Coach Booking Platform)

Remote

- Architected an end-to-end e-commerce platform with a coach booking system using Next.js, TypeScript, and Tailwind CSS; served 10,000–15,000 users.
- Engineered backend with Node.js, MongoDB, and Redis caching; implemented OAuth 2.0 and role-based access control.
- Integrated Stripe for secure transactions and built an automated admin panel, reducing manual overhead by 80%.
- Deployed on AWS EC2 with Supabase for image storage; configured auto-scaling and monitoring.

Software Team Member – Simulation

Aug 2024 – Present

MaRS Research Station, IIITDM Kancheepuram

- Collaborated with cross-functional teams to develop Gazebo simulation environments for rover testing under tight competition deadlines.
- Integrated SLAM and sensor fusion modules for localization and navigation, improving simulation reliability.
- Contributed to code reviews, sprint planning, and documentation to ensure scalable software architecture.

Projects

RepoExplainer – AI-Powered Codebase Analysis | *Node.js, Express, TypeScript, MongoDB, Gemini, RAG*



- Engineered a RAG-based Q&A system for GitHub repositories; Gemini intelligently selects relevant files instead of embedding entire codebases.
- Integrated secure JWT authentication, BCrypt hashing, Zod validation, and GitHub API (Octokit) for on-demand code fetching.
- Designed a context-aware answer generation pipeline with strict source-code grounding and hallucination reduction.

Pothole Detection Backend – Microservices Architecture | *Node.js, Express, TypeScript, PostgreSQL, Prisma, FastAPI*



- Developed a microservices architecture with an Express API gateway and Python FastAPI ML service for real-time smartphone sensor processing.
- Configured spatial clustering ($\pm 5m$) with PostgreSQL/Prisma to prevent duplicate pothole entries; accumulated severity scoring.
- Processed 50+ sensor readings per request using a feature engineering pipeline and TensorFlow inference.

Achievements

- **European Rover Challenge 2025 (Remote):** 4th rank globally among 100+ international teams.
- **International Rover Challenge 2025:** 16th rank in global robotics competition.
- **Competitive Programming:** Solved 600+ DSA problems on LeetCode, Codeforces, and CodeChef.