

KARMAN SINGH

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Education

VIT Chennai

B.Tech Computer Science (AI and Robotics) – CGPA-8.80

Jun. 2024 – May 2028

Chennai, Tamil Nadu

IIT Madras

B.S. in Data Science and Applications

Jan. 2025 – May 2029

Online

Technical Skills

Languages: C++, Python, C, JavaScript, TypeScript, SQL, HTML5, CSS3

Frameworks & Libraries: React, Next.js, Node.js, Express.js, Tailwind CSS, RESTful APIs, GraphQL, WebSockets, NumPy, Pandas, OpenCV

Databases & Caching: MongoDB, PostgreSQL, Supabase, Redis

Developer Tools & Cloud: Git, GitHub, Docker, Linux, AWS, Vercel, Postman, VS Code, CI/CD

Core Computer Science: Data Structures & Algorithms, Object-Oriented Programming (OOP), Database Management Systems (DBMS), Operating Systems, Computer Networks, Distributed Systems, System Design, Agile/Scrum

Artificial Intelligence: Machine Learning, Large Language Models (LLMs), Computer Vision, Image Processing, Model Training & Evaluation

Experience

Grus & Grade Pvt. Ltd.

June 2026 – July 2026

Software Engineering Intern

Remote

- Developing an end-to-end optimization platform enabling industrial manufacturers to compute cost-optimal chemical compound mixtures, reducing manual formulation time while satisfying **10+** production and quality constraints.
- Designed optimization algorithms evaluating over **1,000+** feasible compound combinations per run, minimizing extraction costs and improving recommendation accuracy under multiple operational constraints.

FLSmidth

February 2026 – March 2026

Project Intern

- Developed computer vision and image processing algorithms in Python to denoise industrial mill scan data, reducing measurement error from over **150%** to approximately **10% (93%+ improvement)** in real-world production data.
- Designed and implemented an automated geometry classification pipeline that identifies mill geometries in real time and dynamically selects the optimal processing algorithm, improving pipeline accuracy and scalability.
- Optimized scan analysis workflows for large-scale industrial datasets, improving computational efficiency by an estimated **2x** while increasing automation, reliability, and reducing manual intervention.

Projects

OpenExchange | *Python, Multi-Agent Systems, Machine Learning, WebSockets*

GitHub

- Architecting a simulated stock exchange with a real-time order-matching engine and live order book, where prices emerge purely from agent-driven supply and demand across **multiple** concurrent trading bots instead of scripted trends.
- Designing autonomous trading agents that consume a live simulated news feed of socio-economic events over WebSockets and dynamically adjust strategies in real time, mirroring how real markets react to macro shocks.
- Training a machine learning model on historical market reactions to comparable past news events to predict price movement, then benchmarking its risk-adjusted trading performance against the rule-based bots inside the simulated exchange.

LeetDuel | *Next.js, Redis, WebRTC, PostgreSQL, Drizzle ORM*

GitHub

- Built a full-stack, real-time multiplayer platform enabling users to solve live LeetCode problems together in shared rooms with turn-based coding, live video/audio, and a persistent session history.
- Engineered a Redis pub/sub and Server-Sent Events pipeline for low-latency code synchronization, presence, turn order, and WebRTC signaling, reducing update latency from a **1.5s** polling interval to near real-time.
- Designed a normalized PostgreSQL schema via Drizzle ORM capturing complete session and turn history, including code snapshots and results, integrated with LeetCode's public API for live problem data.

Achievements

IEEE 12-Hour Hackathon – 2nd Place | *Python, Discord API, Audio Processing*

- Secured **2nd Place** out of **20+** teams in a 12-hour hackathon organized by the IEEE Student Chapter by developing **MoodSync**, an AI-powered Discord bot.
- Engineered a real-time voice sentiment analysis pipeline in Python that detected user mood and dynamically recommended music within Discord voice channels.
- Implemented automated voice activity detection and music selection to boost user engagement through seamless integration with Discord APIs and audio processing techniques.