# HARSH GUPTA  |  22ME31038

B.Tech.(Hons.) in MECHANICAL ENGINEERING and M.Tech. in MANUFACTURING SCIENCE AND ENGINEERING

## EDUCATION

| Year | Degree/Exam | Institute | CGPA/Marks |
|---|---|---|---|
| 2027 | M.TECH Dual Degree 5Y | IIT Kharagpur | 8.15 / 10 |
| 2021 | AISSCE | DAV Bistupur | 93.4% |
| 2019 | ICSE | Motilal Nehru Public School | 96.8% |

## COMPETITION/CONFERENCE

**Inter-IIT Tech Meet 13.0 | Contingent Gold**　　　　　　　　　　　　**Nov 2024 - Dec 2024**
- Won **Gold** at **Inter-IIT Tech Meet 13.0** with BharatForge team and built a **full-stack** webapp to control ROS robots.
- Developed a scalable **Flask** backend and **Next.js** frontend with noVNC and an **AI Agent** for real-time system control.

**Opensoft General Championship 2025 | IIT Kharagpur**　　　　　　　　**Mar 2025 - Apr 2025**
- Led a **development team** to build a scalable **full-stack** web application with **FastAPI** and **Next.js** with live features.
- Built a modular chatbot using **gRPC** and **Celery** for async processing, with focus on responsiveness and reliability.

**TapBonds AI Agent Competition | IIT Kharagpur**　　　　　　　　　　**Mar 2025 - Mar 2025**
- Built a responsive **AI chatbot** using Next.js, and implemented intelligent AI Agents using LangChain and LangGraph.
- Designed an **orchestrator system** to route queries across **four agents** for bond discovery, returns, and forecasting.

## PROJECTS

**AI-Powered Mental Health Monitoring Platform**　　　　　　　　　　**Mar 2025 - Apr 2025**
- Built an efficient mental health monitoring platform with **AI chatbot** for daily employee engagement and HR alerts
- Designed a **microservices** architecture with **gRPC**, **Celery**, **Redis**, and **MongoDB** for chat, scheduling, and updates.
- Developed backend services with **FastAPI** and a **TypeScript**-based **Next.js** frontend using Socket.io and JWT auth.
- **Containerized** all backend and frontend services with **Docker Compose** for smooth orchestration and deployment.

**Automated React.js Deployment Platform**　　　　　　　　　　　　**Feb 2025 - Mar 2025**
- Developed an **ECS Fargate** pipeline to clone GitHub React.js repositories, build bundles, and upload to **AWS S3**.
- Implemented a **reverse proxy** routing subdomains to the latest **React deployment** stored in versioned S3 buckets.
- Built a real-time log streaming system using **Kafka**, ClickHouse, and **Socket.io** to monitor deployments efficiently.
- Enabled one-click deployments via **Express** server, provisioning build containers and triggering deployment flows.

**DuoBrain: Content Management Platform with Semantic Search**　　　**Oct 2024 - Oct 2024**
- Developed a scalable content management platform to store videos, links, and notes with efficient **semantic search**.
- Built the frontend using **Next.js**, the backend using **Express** with **TypeScript**, and **MongoDB** as the main database.
- Implemented **vector embeddings** for fast and efficient database indexing and enabled content sharing among users.
- **Dockerized** the entire project using **Docker Compose** and deployed it on **AWS EC2** using **Nginx** as a reverse proxy.

**Movix Prime: Adaptive Streaming and Search**　　　　　　　　　　**Mar 2024 - Apr 2024**
- Built a scalable media streaming platform using **MERN stack** with semantic search and videos stored in **AWS S3**.
- Implemented adaptive bitrate streaming using **m3u8** files, including dynamic quality selection in the video player.
- Secured user authentication and authorization using **JWT**, enabling protected access to paid and restricted content.
- Integrated the **Razorpay** payment gateway for secure and seamless full movie access beyond free movie trailers.

## AWARDS AND ACHIEVEMENTS

- Achieved the designation of **Specialist** with a maximum rating of **1462** on CodeForces (ID:harshxgupta931).
- Secured a Global rank of **327** in CodeForces Div2 (**24k+ participants**) (ID:harshxgupta931).
- Secured Global rank of **3385** in LeetCode Biweekly Contest 157 (**25k+ participants**) (ID:Harsh_Gupta_2916).
- Secured an All India rank of **12216**, positioning in the top 1.2% among 1 million participants in JEE Mains 2022.
- Secured an All India rank of **10310**, placing in the top 6.8% among 0.15 million participants in JEE Advanced 2022.

## COURSEWORK INFORMATION

- **Computer Science:** Programming and Data Structures (Theory and Lab)
- **Mathematics:** Linear Algebra, Numerical and Complex Analysis | Transform Calculus | Advanced Calculus
- **Core:** Applied Thermodynamics | Machines Tools and Machining | Non-Traditional Manufacturing Processes
- **MOOCs:** Algorithms and Data Structures (**AlgoZenith**)

## SKILLS AND EXPERTISE

- **Programming languages:** C++ | JavaScript | TypeScript | Python
- **Frameworks and Libraries:** Next.js | Node.js | Express.js | Socket.io | Prisma | Mongoose | FastAPI | Flask
- **Software and Tools:** Git | GitHub | Postman | MongoDB Compass | Linux (Bash, CLI)
- **Devops and Cloud:** Docker | Docker Compose | Nginx | Redis | Kafka | AWS (EC2, S3, SQS, ECR, ECS)