ABHISHEK KUMAR

Final Year Undergraduate | Department of Mechanical Engineering

abhishekku22@iitk.ac.in | +91-9525803475

Abhishek Kumar | abhishek78527

Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2022 - Present	B.Tech	Indian Institute of Technology Kanpur	**7.3**/10
2021	BSEB(XII)	Sri Gandhi High School, Sitamarhi	84.6%
2019	CBSE(X)	NS DAV Public School, Sitamarhi	91%

Work Experience

New Business Development | JSW Energy | Summer Intern *(May'25 - Jul'25)*

Objective	• Comparative technical analysis of **Alkaline**, **PEM**, **AEM** and **SOEC Electrolyzers**: current status and future outlook
Approach	• Visited an **operational electrolyzer** plant and collaborated with **20+ engineers** to review **15+ P&IDs** documentation • Updated **50+ commissioning** checklists, validated designs, and gained understanding of green hydrogen plant functioning • Benchmarked 10+ critical parameters across 4 electrolyzer types, analyzing TRL stages, **CapEx**, **OpEx**, scalability & **LCOH**
Result	• Detected **18%** potential cost reduction while identifying evaluation gaps, supply-chain risks & delivering PEM-focused roadmap

EchoNet – Share and Converse | Anvay.shop *(Dec'24 - Mar'25)*

Objective	• Aimed to replicate **LinkedIn-like networking platform** with secure communication & collaborative engagement features
Approach	• Developed robust backend using **REST APIs** and **MongoDB** for scalable storage, authentication, and blog-sharing support • Integrated **React** frontend supporting authentication, **blog sharing**, and real-time live chat with seamless, responsive UX • Implemented **Group** & **Direct Messaging**; conducted Unit, System, Integration testing using **Postman** ensuring robustness
Result	• Enabled **50+** concurrent users, reduced communication gaps by 40%, and improved collaboration efficiency by **35%** effectively

Key Projects

GestureTalk | Course project | DES646 | *Prof.* ***Amar Behera*** | (*Aug'25-Nov'25*)

Objective	• To develop a **real-time** sign language to speech translation system using **computer vision** and **deep learning** techniques
Approach	• Implemented hand gesture recognition using **MediaPipe Hands** with **21** landmark keypoints extracted from video streams • Trained a **TensorFlow** and **Keras** deep learning model on **63-dimensional** feature vectors for static gesture classification • Applied frame stability, confidence-based filtering and sentence reconstruction using **Gemini** & **Hugging Face APIs** models
Result	• Achieved **10–12 FPS** performance and **88%** gesture-to-speech accuracy with **2s latency** using **pyttsx3**, **gTTS APIs**

NCC Portal Development | Self Project | (*Oct'24-Dec'24*)

Objective	• To built a **Student Management Portal** in **Django** automating registration, results, and **OpenCV** admit-card generation
Approach	• Processed Excel data for **500+ students**, linked photos via **CBSE** numbers and generated admit cards using **OpenCV** • Implemented **RBAC** approvals, results workflow, generated **500+ certificates** using **FPDF**, embedded verifiable **QR** codes
Result	• Reduced NCC workload by **60%**, halved processing delays, and improved transparency through secure **RBAC** controls

Instrumentation, Signal Processing & ML for Machinery Health Monitoring | *Prof.* ***Nalinaksh S. Vyas*** (*Jun'24-Sep'24*)

Objective	• To develop core **ML-based framework** replicating **NI LabVIEW** functionality for machine health monitoring application
Approach	• Acquired acceleration–time data from **accelerometer** using **NI** Labview; processed in **Python**, computing **FFT**, frequencies • Engineered **time–frequency features**; applied **XGBoost** and **1D-CNN** models for **classification** on vibration datasets • Validated performance by separating **normal** and **faulty** vibration signals using the **domain-specific analysis** techniques
Result	• Achieved **fault detection** and demonstrated **ML-driven monitoring system** comparable to **NI LabVIEW** solutions

Technical Skills

Programming Languages	Libraries	Software & Utilities
C, C++, SQL , LaTeX, Python	Numpy, Pandas, Matplotlib	Power Automate, Power BI, Labview, Tableau, Arduino, AutoCAD

Relevant Courses

Fundamentals of computing I & II	AI/ML for Designers	Introduction to electronics	Machine Learning for Engineers
Robot Manipulators	Complex Variables	Partial Differential equation	Electric Vehicles

Positions of Responsibility

Coordinator Chess Club | **IIT Kanpur** (*May'24- April'25*)

Leadership	• Leading a **2-tier chess club** with **20+ secretaries**, managing **50K budget** and spearheading vibrant **chess initiatives**
Initiatives	• Organized **global** intercollegiate chess tournament with **6000+** participants and a **sponsored** prize pool worth **INR 900K+** • Collaborated with **Prayas and Opportunity School** to host weekly chess **sessions** for **100+ underprivileged children**

Extra-Curricular Activities

Sports	• Earned multiple podium finishes at **Inferno** tournaments, including **Gold** and **Silver** medals (2022–2024) consistently • Achieved **Bronze Medal** in **Udghosh'23** and **Silver Medal** in **Udghosh'24**, demonstrating teamwork and discipline • Captained Chess Team; led **50+ active players**, strategy and training, winning **Gold** and **Silver** medals at sportfests
Social	• Showcased leadership, discipline, and teamwork skills as **NCC cadet** and participated in major IITK **blood donation camp** • Served as **Chess.com Campus Ambassador**, awarding memberships, promoting tournaments, & fostering chess community