AYUSH RAJ

Final Year Undergraduate | Dept. of Economic Sciences
ayush_raj_09 | ayushraj09 | ayushr21@iitk.ac.in | +91-7678691680

ACADEMIC QUALIFICATIONS

Year	Degree/Certificate	Institute	CPI/%
2021 - Present	BS	Indian Institute of Technology Kanpur	7.1/10
2019	CBSE (XII)	DAV Public School, Vasant Kunj, New Delhi	86.8%
2017	CBSE (X)	DAV Public School, Vasant Kunj, New Delhi	8.4/10

WORK EXPERIENCE

Software Developer Intern | Ksham Innovation (*Jun'24 - Jul'24*)

Objective	• To develop a responsive, **user-friendly website** using modern technologies, enhancing company's digital presence
Approach	• Leveraged **Next.js** for **dynamic updates**, ensuring seamless **client-side routing**, & effective server-side **SEO** • Utilized **MongoDB** with RESTful APIs, integrating security to ensure data protection and seamless interactions • Deployed on **Vercel** with integrated CI/CD pipelines for automated builds and updates, ensuring high **reliability**
Impact	• Established a professional online presence, enhancing user engagement and connectivity through a contact page

KEY PROJECTS

Real Estate Full Stack App | Self Project | (*Dec'23 - Feb'24*)

Objective	• To develop a **MERN** stack app with secure **user authentication** & seamless user interface for **property posting**
Approach	• Implemented a secure user authentication system with **Node.js**, **Express.js**, **JWT,** & **bcrypt** for robust security • Utilized **Prisma** to design and enforce **user data schema**, ensuring impeccable data integrity and validation • Developed **RESTful API** endpoints utilizing **Express Router** & **middleware**, ensuring secure user interactions • Implemented **real-time chat** functionality using **WebSockets** and built an interactive frontend using **React**
Impact	• Delivered a **user-centric** property posting platform with real-time communication and efficient data handling

Market Index Prediction | EE798Q Course Project | Prof. Tushar Sandhan | (*May'23 - Jul'23*)

Objective	• To develop a **predictive model** for financial markets, leveraging statistical analysis and ML techniques
Approach	• Applied **RANSACRegressor** for robust outlier removal & **KNNImputer** for null values on **decade** stock data • Trained **LSTM** model on preprocessed data for **50 epochs** to forecast the next 2 days' **stock closing prices**
Result	• Achieved **RMSE** of **21.48** & **100%** directional accuracy in predicting stock prices using trained LSTM model

Breaking CAR-PUF | CS771A Course Project | Prof. Purushottam Kar | (*Feb'24 - Apr'24*)

Objective	• To demonstrate that a **linear model** can predict the responses of a complex **CAR-PUF** rendering it vulnerable
Approach	• Constructed the CAR-PUF model with **2 arbiter PUFs** and **32 multiplexers**, expressed as a linear representation • Reduced the feature vector to **528** dimensions; tuned linear models using **Logistic Regression** and **LinearSVM**
Result	• The PUF was proven susceptible to attacks, achieving **99.4%** accuracy in **1.57 seconds** using Logistic Regression

Open Pit Blasting Pollution Analysis | EE798Q Course Project | Prof. Tushar Sandhan | (*May'23 - Jul'23*)

Objective	• To identify **blasting times** & forecast pollutant concentrations using **time-series analysis** of air pollution data
Approach	• Applied curve fitting techniques with **R-squared** value **0.85** to analyze data patterns while handling **null values** • Leveraged **QQ-plots** to assess the **distribution** of air pollutants data, linking blasting times to pollutant spikes • Utilized **PACF** & **ACF** to identify **AR (p=1)** models for forecasting of future pollution levels for next **2 days**
Result	• Identified blasting times with **95% confidence** and forecasted concentrations **102.23** $\mu g/m^3$ **&** **134.54** $\mu g/m^3$

Trade Relation between ASEAN & India | ECO342A Course Project | Prof. S.K. Mathur | (*Feb'24 - Apr'24*)

Objective	• To conduct an analysis evaluating the **potential welfare impact** on India if it becomes a member of the ASEAN
Approach	• Analyzed trade patterns between **27** countries, including **10 ASEAN** members, **India**, and **16 other nations** • Collected bilateral trade data from WITS, CEPII, World Bank, and UN Comtrade for **27*27** observations • Estimated trade relationships using **gegravity Python** with **PPML**, combining **MTR** & **OTR** terms for analysis
Result	• The analysis indicates that India's inclusion in the ASEAN agreement would not significantly alter trade flows

TECHNICAL SKILLS

Programming Languages & Toolbox	Libraries & Frameworks
C++, JavaScript, Python, SQL, C, HTML, CSS, R, Git, GitHub, Postman, Tailwind, Bootstrap, Vercel	Numpy, Pandas, Matplotlib, Sklearn, Seaborn, OpenCV, Prisma, Bcrypt, Cloudinary, Leaflet, Jsonwebtoken, MongoDB, Node.js, Express.js

RELEVANT COURSES

Fundamentals of Computing	Data Structures and Algorithms	Applied Probability and Statistics
Introduction to ML	Foundations of Inferential Statistics	Image Processing

POSITIONS OF RESPONSIBILITY

Organiser, Public Relations, Antaragni, IIT Kanpur (*Jul'23-Oct'23*)

- Initiated proactive communication with the artist & skillfully negotiated their participation, leading **30+** secretaries for the same
- Adeptly **planned** and **managed** the entire event, ensuring flawless operations and a memorable experience for all involved

EXTRA-CURRICULAR ACTIVITIES

Achievements

- Selected among the **top 5% participants** in the **Adobe GenSolve Hackathon: Curvetopia** (Aug'24)
- Secured **6th position** in **Advent of Code'23** on the IITK Leaderboard out of **100 participants** (Dec'23)