AYUSH RAJ

Final Year Undergraduate | Economic Sciences

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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, Render, Vercel	Numpy, Pandas, Matplotlib, Sklearn, Seaborn, OpenCV, Prisma, Bcrypt, Cloudinary, Leaflet, Jsonwebtoken, MongoDB, Node.js, Express.js

RELEVANT COURSES

Ongoing(*)

Fundamentals of Computing	Data Structures and Algorithms	Computer Network*
Introduction to ML	Image Processing	Computer Vision and Deep Learning*

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)