Vishal Singh

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Vishal Singh | Vishal Singh

Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2024 - Present	MSc	Indian Institute of Technology Kanpur	**7.85**/10
2024	B.A(Hons)	University of Delhi	**8.01**/10
2020	Class XII (CBSE)	Army Public School	94.8%
2018	Class X (CBSE)	Army Public School	96%

Scholastic Achievements

- Obtained an **A*** grade in Foundations of Financial Risk course. *Jul'25*
- **AIR 321** in **Graduate Aptitude Test in Engineering** (GATE-XH). *Mar'24*

Research Experience

Human Development Journey of Uttar Pradesh after Economic Reforms of 1991 *Dec'23*

- Conducted **analysis of Human Development Index (HDI)** trends for Uttar Pradesh from 1993–94 to 2020–21.
- Evaluated **economic, health, and education indicators** including Per Capita Income, Life Expectancy, and Schooling Years.
- Applied **UNDP HDI methodology** for computation of Health, Education, and Income Indices.
- Used **data sources** such as NSSO, PLFS, and World Bank PPP data.
- Interpreted findings to highlight **policy implications** for inclusive and sustainable development.
- Compared Uttar Pradesh's development trajectory with other Indian states like Kerala, Tamil Nadu, and Assam.

Key Projects

Predictive Modeling of Stock Prices Using ANN and LSTM Course Project |*May'25-Jul'25*

- **Developed and compared ANN and LSTM models** for predicting next-day stock closing prices using historical OHLC data and technical indicators.
- **Implemented feature engineering** and data normalization for model accuracy.
- **Achieved superior performance with LSTM**, reducing error metrics compared to ANN, demonstrating better temporal pattern learning.
- **Evaluated model performance using RMSE, MAPE, and MBE**, with results visualized through Python for interpretability and presentation.

Predicting Bankruptcy and Detecting Money Laundering using Machine Learning Course Project |*Apr'25*

- Designed and implemented machine learning models **(Logistic Regression, KNN, SVM, Decision Tree, Random Forest)** for bankruptcy prediction using 78K+ firm-level financial records.
- Conducted comparative model evaluation to achieve **high accuracy and the high ROC-AUC score.**
- Applied **Machine Learning techniques** on the Bitcoin dataset to detect money laundering cases.
- Compared and evaluated the models to measure effectiveness in high-dimensional classification tasks.

Structural Dynamics of National Economies: A Macroeconomic Comparison Course Project |*Apr'25*

- Conducted a **comparative macroeconomic analysis** of India and the U.S., examining consumption, investment, labor share, capital share, and government spending as proportions of GDP.
- Analyzed **business cycle dynamics**, focusing on how key indicators behaved during recessions, including the **2007–2009 financial crisis**.
- Studied **labor market performance** through unemployment rates, joblessness duration, and income distribution between labor and capital.
- Evaluated long-term trends in **per capita output, consumption growth, and inflation**, linking findings to economic stability and policy implications.

Credit Risk Analysis using Machine Learning Models Self Project |*June'25*

- Built a **Credit Risk Prediction Model** using Random Forest and CatBoost to classify borrowers into high- and low-risk categories.
- Performed **data preprocessing and feature engineering** (scaling, encoding, handling missing values) to improve model accuracy.
- Conducted **exploratory data analysis (EDA)** with Seaborn, Matplotlib, and Plotly to identify key drivers of credit default.
- Evaluated models using **precision, recall, F1-score, and ROC-AUC**, ensuring balanced predictive performance.

Stock Market Forecasting via ARIMA Approach Self Project |*June'25*

- Built a **time series forecasting model (ARIMA)** to predict stock prices.
- Performed **trend analysis, stationarity checks, and parameter tuning** for model optimization.
- Evaluated accuracy using **MAE and RMSE**, ensuring reliable stock price predictions.

Optimal Portfolio Design via Sharpe Ratio Maximization Self Project |*Mar'25*

- Designed and implemented a **portfolio optimization model** to maximize Sharpe Ratio using historical stock market data.
- Applied **modern portfolio theory techniques** including risk-return tradeoff and diversification strategies.

- Conducted **data preprocessing and financial analysis** with Python (Pandas, NumPy, Matplotlib) to evaluate asset performance.
- Optimized portfolio weights using **Sharpe Ratio maximization**, improving return-to-risk efficiency.

Markowitz Theory with Gradient Boosting for Optimal Portfolios Self Project |*Dec'24*

- Implemented **Markowitz Theory** to construct a **minimum variance portfolio** optimizing risk-return tradeoff.
- Applied **Gradient Boosting models** for financial data analysis, enhancing prediction of portfolio returns.
- Performed **portfolio optimization** and asset allocation, evaluating **expected return, variance, and Sharpe Ratio** to demonstrate efficient diversification.

CPI Analysis and Recession Probability Self Project |*Dec'24*

- Conducted **CPI trend analysis** to study inflation patterns and their impact on economic stability.
- Built a **predictive model for recession probability** using macroeconomic indicators and time-series data.
- Applied **statistical and machine learning methods** to identify leading signals of economic downturns.
- Visualized insights for clear interpretation of inflation–recession dynamics.

Positions of Responsibility

Research Sub-Head | Wirtschaft-The Economics Society *Sep'23-Apr'24*

- Edited the weekly newsletter **"Wirtschaft Weekly"** for the society.
- Authored and contributed articles for the society's social media platforms.
- Coordinated with various departments to ensure seamless functioning of the society.

Technical Skills

Programming Languages: Python, LaTeX, SQL
Libraries and Softwares: Numpy, Pandas, Matplotlib, Plotly, Scikit-learn, Matlab, Stata
Other: Google Workspace, Microsoft Office Suite

Relevant Courses

Foundations of Financial Risk	Game Theory Applications
Applied Probability and Statistics	Economic Data Analysis
Computational Methods in Economics	Mathematical Methods for Economics
Applied Macroeconomics	Advanced Topics in Microeconomics
Microeconomics	Econometrics I
Statistical Methods for Economics	Linear Programming and Game Theory
Public Economics	Money and Financial Markets
Development Economics I	Development Economics II
Contemporary Economic Issues	Environmental Economics
Numerical Methods	Data Analysis
Econometrics II*	Public Economics and Public Policy*

* Ongoing Courses

Extra Curricular Activities

Volunteer:

- Organized and supported the **5 KM Run & Walk event (March 2025)** for the IIT Kanpur campus community, in collaboration with the **Gender Cell**, promoting awareness on gender sensitivity and inclusivity.
- Volunteered in a **Cleanliness Drive** during *Inter IIT Sports Meet 2024*, contributing towards environmental sustainability and community service.

Certificates:

- Completed Data Science Lab Certification by WorldQuant University, gaining hands-on experience in applied data science and quantitative analysis.