Aditya Saxena

Young graduate with expertise in machine learning and quantitative research, proficient in Python and statistical modelling.

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EDUCATION

Harvard University **CA, Massachusetts**
Masters in Data Science – (Computer Science & Statistics) Aug 2024 - Dec 2025 (Expected)

- **Anticipated Coursework:** Stochastic Methods for Data Analysis, Inference, & Optimization, Time Series Prediction, Statistical Machine Learning, Generalized Linear Models, Sequential Decision Making, Applied Linear Algebra and Big Data, Bayesian Statistics, Advance Topics in Data Science

Massachusetts Institute of Technology (MIT Sloan) **CA, Massachusetts**
Financial Mathematics Concentration (Cross Registration) Aug 2024 - Dec 2025 (Expected)

- **Anticipated Coursework:** Analytics of Finance, Mathematical Methods for Financial Engineering, Quantitative Models

Birla Institute of Technology and Science (BITS) Pilani **Dubai, UAE**
Bachelor of Engineering in Computer Science (Distinction) June 2019 - June 2023

- **CGPA & Honors: 9.62/10** (Academic Excellence Awardee), Merit Scholarship (Top 1%), National Undergraduate Research Awardee (2021, 2022), BITS Mantra Research & Innovation Awardee (1/1000)
- **Relevant Coursework:** Data Structures and Algorithms, Object Oriented Programming, Theory of Computation, Probability and Statistics, Mathematics (I, II, III), Discrete Mathematics, Data Mining, Deep Learning

WORK EXPERIENCE

Rostrum Grand Asset Management **Hong Kong City, Hong Kong**
Machine Learning & Data Engineer (Full Time) Jan 2023 – July 2024

- Built OLS-based predictive model with Adjusted R-squared valued >85% using 10+ years of historical and real-time data.
- Accurately forecasted fund performances using analysis of 150+ financial metrics across the portfolio.
- Employed Python scripts with pandas for data cleaning, reducing processing time by 33% and rectifying data quality issues.
- Received the highest performance rating given to top-quartile interns and was offered a full-time role during internship.

WorldQuant BRAIN **Remote**
Quant Research Consultant (Part-Time) May 2024 - August 2024

- Conducted quantitative research and backtest trading signals based on momentum, reversal, and volatility to predict global equity performance across various international markets.
- Submitted 50 trading alphas with Sharpe > 1.5 and correlation < 60%, with 41 used in production models.
- Hired after Gold Level in WorldQuant Challenge & qualifying for Stage 2 (Top 5%) International Quant Championship, 2024.

RESEARCH EXPERIENCE

Cost Efficient Stock Prediction and Forecasting with Enhanced LightGBM, *Main Author* **December 2022**
Research Advisor: Dr. Tamizharasan PS - ***IEEE International Conference MoSICom*** **[PDF]**

- Optimized LightGBM model, achieving a 15.2% annualized return and a 1.24 Sharpe ratio, outperforming benchmark returns.
- Created cost-awareness strategy to reduce false-positive errors, lowering investment costs and more reliability.

Credit Risk Assessment Model for UAE's Commercial Bank, *Main Author* **April 2021**
Research Advisor: Dr Parizad Dungore - ***2nd Place, National Undergraduate Research Competition*** **[PDF]**

- Formulated a credit-risk classification model using Linear Discriminant Analysis, achieving 95.2% accuracy.
- Implemented Logistic Regression, and Decision Trees on commercial records, identifying risk factors via feature selection.

Lithium-Ion Battery Life Prediction from Initial Stage-Cycles Using ML, *Main Author* **May 2020**
Research Advisor: Dr Vilas Gaidhane - ***Granted Intellectual Property Right*** **[PDF]**

- Developed a Gradient Boosting Trees model to predict lithium-ion battery life using initial 50-cycle charge/discharge data.
- Applied PCA for dimensionality and noise reduction, enhancing model robustness for commercial deployment.

KAGGLE PROJECTS

Realized Short-Term Volatility Prediction Challenge **[GitHub]**

- Performed EDA, feature engineering, and bucket time interval construction on high-frequency trading data to forecast short-term volatility for 100+ stocks.
- Constructed benchmark Auto Regression AR(1) model, achieving RMSPE of 0.341 and R2 score of 62.8%.

Nasdaq Closing Price Prediction **[GitHub]**

- Deployed supervised learning algorithms for predicting Nasdaq stock closing prices using order book and auction data, optimizing for late-day trading strategies.
- Engineered features including imbalance ratios and used regularization techniques to reduce overfitting, achieving 3.3% Mean Absolute Error.

RESEARCH EXPERIENCE [EXTENDED]

Cost Efficient Stock Prediction and Forecasting with Enhanced LightGBM, *Main Author* **December 2022**
Research Advisor: Dr. Tamizharasan PS - ***IEEE International Conference MoSICom*** **[PDF]**

- Optimized LightGBM model, achieving a 15.2% annualized return and a 1.24 Sharpe ratio, outperforming benchmark returns.
- Created cost-awareness strategy to reduce false-positive errors, lowering investment costs and more reliability.

Deep Learning-Based Smart Parking Management System, *Co-Author* **May 2021**
Research Advisor: Dr. Tamizharasan PS - ***Springer Journal, CVIP 2021, Singapore*** **[PDF]**

- Architected the workflow of ensemble techniques for detecting and classifying parking occupancy with 95% precision.
- Used TensorFlow for training and evaluation, improving F1 score, recall, and precision metrics.

Credit Risk Assessment Model for UAE's Commercial Bank, *Main Author* **April 2021**
Research Advisor: Dr Parizad Dungore - ***2nd Place, National Undergraduate Research Competition*** **[PDF]**

- Formulated a credit-risk classification model using Linear Discriminant Analysis, achieving 95.2% accuracy.
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Lithium-Ion Battery Life Prediction from Initial Stage-Cycles Using ML, *Main Author* **May 2020**
Research Advisor: Dr Vilas Gaidhane - ***Granted Intellectual Property Right*** **[PDF]**

- Developed a Gradient Boosting Trees model to predict lithium-ion battery life using initial 50-cycle charge/discharge data.
- Applied PCA for dimensionality and noise reduction, enhancing model robustness for commercial deployment.

Real-Time Drowsiness Detection Using Computer Vision to Prevent Car & Road Accidents, *Main Author* **May 2020**
Research Advisor: Dr. Raja Muthalagu - ***Granted Intellectual Property Right*** **[PDF]**

- Developed and implemented a real-time drowsiness detection system using OpenCV's Haar Cascade Classifier, achieving an accurate detection rate of drowsiness and distraction.
- Utilized Raspberry Pi 4+ and NoIR-V2 Pi camera for hardware implementation, ensuring efficient real-time processing and low energy consumption.

KAGGLE PROJECTS [EXTENDED]

Realized Short-Term Volatility Prediction Challenge **[GitHub]**

- Performed EDA, feature engineering, and bucket time interval construction on high-frequency trading data to forecast short-term volatility for 100+ stocks.
- Constructed benchmark Auto Regression AR(1) model, achieving RMSPE of 0.341 and R2 score of 62.8%.

Nasdaq Closing Price Prediction **[GitHub]**

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- Engineered features including imbalance ratios and used regularization techniques to reduce overfitting, achieving 3.3% Mean Absolute Error.

Jane Street Market Prediction Challenge **[GitHub]**

- Developed a multi-model ensemble combining LightGBM and custom cost awareness function, leading to an 8% increase in the sensitivity score.
- Utilized a time-series API for real-time predictions, effectively handling high-frequency trading data and optimizing trading decisions.

COURSERA ONLINE CERTIFICATIONS

- Mathematics for Machine Learning Specialization *(By Imperial College London)*
- Overview of Advanced Methods of Reinforcement Learning in Finance *(By New York University)*
- Fundamentals of Quantitative Modeling *(By University of Pennsylvania)*
- Financial Markets *(By Yale University)*
- AWS Machine Learning *(By Amazon Web Services)*
- Managing Machine Learning Projects with Google Cloud *(By Google Cloud)*