Aditya Saxena

Master's student with expertise in machine learning and quantitative research, proficient in Python programming.

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EDUCATION

Harvard University — **Cambridge, MA**
Masters in Data Science – (Computer Science & Statistics) — Aug 2024 - Dec 2025

- **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) — **Cambridge, MA**
Researcher, Laboratory for Information & Decision Systems — Jan 2025 - May 2025

- **Advisor:** Roy E Welsch
- **Research Topic:** Portfolio Optimization with Stochastic Return Functions: An Algorithmic Approach

Birla Institute of Technology and Science (BITS) Pilani — **INDIA**
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

Engineer's Gate — **New York, NY**
Quantitative Researcher (Incoming Summer 2025 Intern) — May 2025 – August 2025

- I will be joining the Alpha Generation Team at Engineer's Gate, a NYC-based hedge fund, this summer to work on Long/Short Equity strategies.

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 41 used in production, achieving Sharpe > 2, turnover > 25%, and correlation < 60%.
- Hired after Gold Level in WorldQuant Challenge & qualifying for Stage 2 (Top 5%) International Quant Championship, 2024.

RESEARCH EXPERIENCE

Revisiting the Equity Premium Puzzle: Time Series Forecasting 1990–2012, *Main Author* — **Ongoing**
Independent Research – Department of Computer Science, Harvard University

Algorithmic Trading: Comparative Analysis of Quadrant Strategies, *Main Author* — **Ongoing**
Independent Research – Department of Computer Science & Statistics, Harvard University

Comparative Analysis of Time-Series Regression Techniques, *Main Author* — **January 2025**
Independent Research – Department of Computer Science & Statistics, Harvard University — [**Under Publication Review**]

- Analyzed Ridge, Lasso, Weighted Norm, and Quantile Regression on financial time-series data using MSE, MAE, and R^2.
- Demonstrated Ridge's predictive accuracy and Weighted Norm Regression's robustness to outliers.

Enhancing Financial Factor Analysis with IPCA and Procrustes Alignment, *Main Author* — **December 2024**
Research Advisor: Alexander Young – Department of Statistics, Harvard University — [**Under Publication Review**]

- Applied IPCA to estimate latent factors in high-dimensional financial data, leveraging observable characteristics.
- Enhanced factor interpretability with Procrustes alignment, reducing cross-validation discrepancies by 70%.

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 100-cycle charge/discharge data.
- Applied PCA for dimensionality and noise reduction, enhancing model robustness for commercial deployment.

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.

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.

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)*