Danish Shah

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EDUCATION

Cornell University, Ithaca, NY
MEng – Operations Research, Financial Engineering, **GPA: 3.98,** Cornell University Fall Fellowship (2023) **Dec 2023**

Indian Institute of Technology (IIT) Madras, Chennai, India
BTech – Mechanical Engineering, **GPA: 3.86,** First Division with Distinction **July 2020**

Selected Coursework: Advances in Financial ML (TA), Reinforcement Learning, Big Data Technologies, Optimization, Game Theory, Monte Carlo Simulations, Quant Trading Strategies, Volatility Surface Modeling, Fixed Income Derivatives, Portfolio Management

SKILLS & ACTIVITIES

Technical: Python, C, C++, Java, Scala, Unix/Linux, Bash, R, MATLAB, SQL, HBase, Hadoop, MapReduce, Spark
Activities: Badminton, Volleyball, Poker, Finance club, Programming club, National Cadet Corps Air Squadron at IIT Madras

EXPERIENCE

Quantitative Trader - Valkyrie Trading, Chicago, Illinois **May to Aug 2023**

- **Options Market Making:** Employed proprietary pricing models on a **Systematic Trading** desk to accurately determine fair value and pricing for crude oil option contracts and combos, to optimize trading decisions and maximize profitability.
- Actively monitored and adjusted option positions to maintain risk tolerance levels and adhere to risk management protocols.
- **Quantitative Research:** Created a mathematical volatility surface model to quantify event impact on equity ETF prices; developed an algorithm to predict event premium, and back-tested it for past and future events.
- Identified opportunities and implemented optimal, automated trading strategies in collaboration with senior traders & SWEs.
- Enhanced model's pricing accuracy and edge by 10% by integrating new data sources, and introduced novel trading signals.

Engineering Analyst - Goldman Sachs, Bangalore, India **Aug 2020 to July 2022**

- **Data Science:** Performed statistical analysis on trade data using Python, and trained time-series (ARIMA, GARCH) and machine-learning models to study client activity and market signals, to identify predictable patterns in the firm's transactions.
- **Big Data:** Built distributed computing systems to process global markets data (1.2B+ rows per day) using Hadoop and Spark, and improved data pipeline efficiency by 74% by ensuring optimal distribution of data across parallel MapReduce tasks.
- Collaborated with multiple front and back office teams, developing tools for different upstream/downstream business functions, and helped them with collecting, and analyzing large amounts of data from various sources.
- **Programming:** Developed Java, Scala applications, and APIs to collect, format and write data to hdfs, Hbase, data-lake, etc.
- Wrote and reviewed code written by other developers in the team, and managed the team's production releases, version control, UAT testing, etc., overseeing the completion of tasks through the software development cycle.

Data Scientist - Anheuser-Busch InBev, Bangalore, India **May to July 2019**

- **Data Analytics:** Analyzed and built predictive models (kNN, SVM) on aptitude data to measure cultural fitness of candidates
- Developed & deployed a web-scraper bot that uses Talent Acquisition tools available in the market for proactive recruitment.

RESEARCH & PROJECTS

Creating new Mid-point Order Type, *Capstone Project, Members Exchange (MEMX)*, Jersey City, NJ **Sep to Dec 2023**

- Created an adjustable order book simulation featuring various order types (limit, mid-point, etc.) to facilitate strategy testing.
- Developed a novel midpoint order type to enhance trading performance and mitigate the risks of adverse selection.
- Conducted back-tests utilizing high-frequency trading data to validate enhanced liquidity and favorable pricing outcomes.

Optimal Execution Strategies for Meta-Orders, *Cornell University* **Jan to May 2023**

- Developed a trading strategy for institutional investors that accounts for various costs during re-balancing and transitions.
- Applied **Dynamic Programming** and Monte Carlo methods to minimize costs, comparing with static liquidation strategies.

Exploratory Analysis between Realized and Implied Volatility of the S&P 500 Index, *Cornell University* **Jan to Mar 2023**

- Studied the underlying dynamics and distribution of **Volatility Risk Premium** for the S&P 500 using historic options data.
- Analyzed and fitted multivariate Generalized Normal Distribution (GND) using R to predict future volatility in the market.

Neural-Network based approach to Non-Linear Pairs-Trading, *IAQF Student Competition 2023* **Dec to Feb 2023**

- Developed an algorithm to detect & quantify non-linear correlations between ETFs, facilitating more effective pairs-trading and **Statistical Arbitrage** strategies.
- Built a neural-network based approach to capture non-linear patterns; achieved superior results compared to linear strategies.