Danish Shah

ms3329@cornell.edu 314 N Plain St #2, Ithaca, NY 14850 cell: +1 (607) 697-5526

EDUCATION

Cornell University, Ithaca, NY
MEng – Operations Research, Financial Engineering, **GPA: 4.0** **Expected Dec 2023**

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

Selected Coursework: Machine Learning, Reinforcement Learning, Big Data Technologies, Optimization, Monte Carlo Simulation, Time Series Analysis, Game Theory, Portfolio Management, Data Structures and Algorithms, Numerical Programming Methods

EXPERIENCE

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

Software Developer - Agnikul Cosmos, Chennai, India **May to July 2018**

- **Numerical Simulation:** Developed a computer model using Python and MATLAB to simulate rocket launch, and compute the trajectory of the rocket and its payload, along with the dropped stages and debris
- Programmed a dynamic atmosphere model with wind profile and randomness based on academic research; integrated this with the trajectory program and ran **Monte-Carlo simulations** to compute uncertainties in the predicted trajectories

RESEARCH & PROJECTS

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* **Jan to Feb 2023**

- Developed a testing algorithm that identifies and quantifies non-linear relationships between ETFs for pairs-trading
- Built a neural-network based approach to capture non-linear patterns; achieved superior results compared to linear strategies

Generative Adversarial Networks (GAN) for Cryptocurrency Trading, *Cornell University* **Aug to Oct 2022**

- Trained a TimeGAN model to generate synthetic cryptocurrency price time-series data using *Tensorflow* and *Keras*
- Implemented the modified Autoencoder network in cryptocurrency price forecasting & predictive models for trading

Spatial Convolutional Neural Networks (CNN) for Heat Transfer Model, *IIT Madras***,** India **Jan to Dec 2019**

- Trained a 3-D CNN to predict the outcome of Computational Thermodynamics software for complex fin shapes
- Reduced run-time for complex cases (from days to a few minutes) when using the model as the initial field in a simulation

Modeling Chaotic Quantum Mechanical Systems, *IIT Madras,* India **July 2018 to June 2019**

- Performed optimized high-dimension matrix operations using **Random Matrix Theory (RMT)**, modeling a quantum operator
- Studied the eigen-phase & spacing distributions, and Lyapunov exponent for different RM statistical distributions

SKILLS & ACTIVITIES

Technical: Python, C, C++, Java, Scala, Unix/Linux, Bash, R, MATLAB, SQL, HBase, Hadoop, MapReduce, Spark Tensorflow, Keras, Numpy, Pandas, Scikit-learn, Scipy, NLP, CNN, GAN, SVM, Decision Trees, Regression

Activities: Finance club, Programming club, National Cadet Corps Air Squadron at IIT Madras