Mobasher Khan

January 24, 2019

Contact Information

Email: m.khan@columbia.edu
Phone: ***7184338487***
Project Portfolio: http://mobykhan.com
https://www.linkedin.com/in/mobasherkhan

Education

Columbia University, New York, NY *September 2018 - May 2019*

- *Degree: Master of Arts* in Mathematics (*Mathematics of Finance*), *GPA:* 3.8/4.0
- *GRE: Quant:* 168/170, *Verbal:* 166/170, *AW:* 5/6
- *Courses:* Brownian Motion & Stochastic Calculus, Time Series Analysis, Financial Math, Fixed Income PM, Non-Linear Option Pricing, Multi-Asset PM, Monte Carlo Methods

Princeton University, Princeton, NJ *September 2013 - June 2018*

- *Degree: Bachelor of Science in Engineering* in Mechanical & Aerospace Engineering
- *Departmental GPA:* 3.6/4.0; Elected to *Sigma Xi*

Work & Research Experience

Machine Learning & Energy Storage Research, Princeton, NJ *August 2017 - June 2018*

- Evaluated the performance of 15 regressors and 7 time series data preprocessing techniques in predicting battery state of charge, capacity, & rate retention by creating a Python library.
- Created interactive *Capacity vs Cycle* graphs and differential capacity curves to display different capacity degradation regimes by modifying the *Bokeh* visualization library in Python.
- ***Applications of Data Science to Electrochemistry***: http://mobykhan.com/th.pdf

Propulsion Engineering Intern, Williams International, MI *May 2016 - August 2016*

- Utilized and amended CFD codes in FORTRAN for running aerodynamic simulations & wrote scripts in Python and Unix Shells to assess convergence, compare test data with simulation results, intelligently update CFD parameters and rerun simulations until within tolerances.

Manufacturing Engineering Intern, AAI Corp., Hunt Valley, MD *May 2015 - July 2015*

- Created manufacturing process documents for teardown & retrofitting of RQ-7 Shadow UAVs.
- Converted Manufacturing & Repair warehouse into a full UAV repair system in AutoCAD & Siemens NX, accounting for hardware, workflows, FOD areas, and repair processes.

Projects in Financial Mathematics

Trading Short-Term Volatility Forecasts, Columbia University, NY *Sept. 2018 - Dec. 2018*

- Used a GARCH(1,1) model to generate σ forecasts and trading signals, where increasing vol. trends signaled *mean reversion* and decreasing vol. trends signaled *trend following* trades.
- Incorporated transaction costs, NASDAQ rebates, & price improvement during backtesting.

Paper Fixed Income Portfolio, Columbia University, NY *September 2018 - December 2018*

- Created a $500M bond portfolio within duration, convexity, & industry allocation limits.
- Hedged portfolio using swaps, futures, eurodollar futures, and short sales.
- Calculated interim P&L, Yield, DV01. *Final P&L:* $1.65M, *Final Basis Point Value:* -$9100

Predicting Market Corrections, Columbia University, NY *September 2018 - December 2018*

- Used and evaluated GARCH models for predicting onset and duration of correction periods.
- Formulated an algorithm for predicting correction using the number of S&P 500 stocks entering *death crosses*. Evaluated algorithm performance using sensitivity and specificity measures.

Skills & Languages

Technical: Python, Microsoft Excel, Unix Shell, Option Pricing, Portfolio Management
Languages: English, Portuguese, Arabic, Bengali, Spanish