MD AMIR KHAN

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GitHub — Portfolio — LinkedIn

STEM OPT (Eligible 3-years)

EDUCATION

Stevens Institute of Technology, School of Business — January 2024 – Dec. 2025
Master of Science in Financial Engineering & Financial Analytics — Hoboken, NJ
Thesis pending – available for full-time roles immediately — GPA: 3.90 /4.00

Courses: Stochastic Calculus for Financial Eng., Applied probability & Statistics in Finance, Advanced Financial Risk Analytics & Derivatives, Machine Learning in Finance, Pricing & Hedging, Computational Methods in Finance, Portfolio Theory & Applications, Market Microstructure, Algorithmic Trading Strategies, Design Patterns & Derivative Pricing in C++, Optimization in Finance

North South University (NSU) — January 2018 – December 2022
B.B.A (Major: Finance, Minor: Mathematics) — Dhaka, Bangladesh

COMPUTATIONAL SKILLS

Programming Languages: Python (NumPy, Pandas, SciPy, Scikit-learn, Pytorch, Tensorflow, Keras, Matplotlib, Seaborn, Plotly, OpenBB, Statsmodels, Zipline, PyFolio, Riskfolio-Lib, Vectorbt), C++, SQL, Tableau, Excel

Development & Deployment: Jupyter Notebook, Git, Github, VS Code, AWS, QuantConnect, FastApi, Streamlit, Docker

Skills: Systematic Alpha, Factor/Stat Modeling, Advanced Risk Modeling(VaR, CVaR, Stress Testing), Portfolio Optimization, Backtesting & Attribution, Time Series & Predictive Modeling, Data Pipeline Design, ETL Workflows, Big Data Processing

EXPERIENCE

UCB Brokerage — January 2022 – December 2023
Quantitative Researcher, Research Division — Dhaka, Bangladesh

- Designed target-date fund glide-paths for various buy-side clients, responsible for the entire workflow including asset allocation model construction, asset parameters modeling, and back-testing
- Designed a target-risk fund with volatility, downside deviation and VaR limiting based on the risk parity strategy, and improved its Sharpe ratio by 34% by estimating the covariance matrix with EWMA and shrinkage methods
- Conducted performance attribution analysis on 1,400+ fixed income mutual funds over the past 14 quarters using the Campisi model, analyzed attribution results statistically, and composed a research report summarizing findings
- Researched a multi-asset market timing strategy using macro factors based on factor IC's, Granger causality tests, etc., achieved annual return of 20.2% and Sharpe ratio of 0.73 on DSE over 14 years

Standard Chartered Bank — January 2021 – December 2021
Quantitative Investment Intern — Dhaka, Bangladesh

- Researched factor selection for multi-factor stock selection models in the Bangladesh A-share market; evaluated PE ratio and monthly sales growth; Backtested industry-neutral portfolios in Python; tracked historical performance using annualized return, max drawdown, and Sharpe ratio
- Maintained trading data pipelines and automated daily performance reporting of factor-based equity strategies

PROJECTS

Vasicek Bond Pricing & Kalman Filtering — Python — June 2024

- Simulated **5,000 Vasicek short-rate paths** across **20,000 steps** to model mean-reverting interest rates
- Priced zero-coupon bonds via **closed-form, Monte Carlo, and PDE methods**, achieving <0.05% deviation
- Applied **Kalman Filtering & Smoothing** on noisy data ($\sigma_{\text{noise}} = 0.1$), estimating κ, θ, σ with <0.1% error
- Optimized parameters through **MLE (1,000 iterations)**, converging in under 200 with stable estimates
- Validated a **robust fixed income modeling pipeline** for pricing, risk management, and state estimation

SPY Momentum Alpha: Backtesting 2 Years of Free Polygon Data — Python — January 2025

- Developed a Python back-testing engine to replicate an intraday momentum trading strategy for the S&P 500 ETF (SPY)
- Fetched two years of market tick by tick data via Polygon API; used Pandas, NumPy, Matplotlib, and Statsmodels to compute VWAP, volatility, and price moves; implemented trade signals, position sizing, and cost calculations
- Successfully replicated strategy performance with a total return of 79%, an annualized return of 35.8%, and a Sharpe Ratio of 1.67, demonstrating robust risk-adjusted performance relative to a passive S&P 500 benchmark

Multi-Asset Portfolio Optimizer: Risk-Aware Allocation — Python, Riskfolio-Lib — August 2024

- Optimized 25-asset portfolio using Riskfolio-Lib and SLSQP, targeting Sharpe-maximizing allocation**(0.81)**
- Ran 10,000 Monte Carlo simulations with real-world constraints to evaluate portfolio efficiency
- Applied 13+ risk metrics, including CVaR, to stress-test portfolios and manage downside exposure
- Visualized allocation outputs and efficient frontiers using Matplotlib to support strategic decisions

ACTIVITIES & AWARDS

- Member, **CFA Society New York**; actively engaged in professional events and preparing for **FRM Part I Exam**
- Open-source contributing to **Riskfolio-Lib**, a leading Python library for portfolio optimization and risk management
- Competed in WorldQuant's 2023 Int'l Quant Championship, crafting & testing advanced trading strategies