Hamzeh Hamdan

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Education

Harvard University Cambridge, MA
B.A., Computer Science & Statistics. GPA: 3.74. May 2025
Relevant Coursework: Probability, Statistical Inference, Linear Models, Algorithms, Systems Programming and Machine Organization, Data Science, Deep Learning for Unstructured Data.

Projects

ARIMA-based Pairs Trading of Bitcoin and Ethereum **May 2024**

- Trained an ARIMA model on the log price spread and the log returns spread of BTC and ETH on data from 2016 to 2021, with test sign prediction accuracies of 52.2% and 74.8%, respectively.
- Coded a pairs trading strategy using the price spread model that returned 23.5% on 2022-2023 testing, during which holding BTC and ETH would've returned -40% and -56%, respectively.

Measuring Cosine Similarity from Embeddings of SEC 10-K Filings **May 2024**

- Using text data from SEC's EDGAR API, tokenized and embedded data using a BERT-variant and provided methods for clustering with K-Means and HDBSCAN, visualization using t-SNE and UMAP, and validation through cosine similarity heatmaps and proximity validation.
- Testing with 23 S&P 100 companies across 7 GICS industries yielded a 79% accuracy and 48% coverage, though the cosine similarity threshold can be adjusted to change these results.

Awards

MIT iQuHACK 2024 | 2nd Place in Moody's Challenge Cambridge, MA
Mean-VaR Portfolio Optimization with Simulated Quantum Annealing **February 2024**

- Developed a portfolio optimization algorithm utilizing mean-variance and value at risk, framed as a quadratic unconstrained binary optimization problem, and solved using simulated quantum annealing.

Experience

Comcast Philadelphia, PA
Corporate FP&A Intern **May – Current**

- Developed the first secure and private internal generative artificial intelligence tools for the corporate finance team using the Azure OpenAI Services API SDK.
- Integrated custom database connections and management, file search, report generation, and data analysis and visualization in the application through a Streamlit UI.
- Initial testing with equity-based compensation analyses reports increased efficiency by ~93%.
- Working with head of M&A on developing an internal AI research tool.

Propel Bio Partners Remote
Data Science Intern **January – February 2024**

- Developed a Python class that runs Monte Carlo simulations to estimate portfolio return.
- Provided methods to estimate the margin of error for Propel Bio's probability of success estimates for previous long-term investments, to assess the risk of individual investments, and to estimate the potential impact of a new investment based on the entire portfolio.

Skills

Technical: Python, Linux, SQL, Azure Services