

EDUCATION

COLUMBIA BUSINESS SCHOOL

MS, Financial Economics

GPA: 9.6/10

New York, NY

2021 - 2023

Coursework (PhD): Optimization, Econometrics, Continuous Time Models, NLP, RL, Probabilistic ML, Fair and Robust Algorithm

SUN YAT-SEN UNIVERSITY

BS, Mathematics and Applied Mathematics

GPA: 3.9/4

Guangzhou, China

2015 - 2020

Honors: Graduated with highest distinct (Top 0.5%), Microsoft Stars of Tomorrow, JPMorgan Fellowship

EXPERIENCE

HARVARD UNIVERSITY

Research Associate

Boston, MA

Summer 2022

- Proposed a generalizable measurement for sample uniqueness, modeled the uniqueness of Airbnb images;
- Trained a momentum contrastive CNN model on 300k Airbnb photographs to learn image uniqueness;
- Utilized the Places365 dataset for scene classification transfer learning, identified unique images in each scene;
- Contrasted masked image augmentations to visualize important objects in the image.

COLUMBIA UNIVERSITY

Research Associate

New York, NY

Summer 2022

- Formulated hotel recommendation as a reinforcement learning problem, modeled consumer learning process with a Bayesian simulator and adopted Actor-Critic model to obtain optimal policy and value function;
- Framed Elimination By Aspects (EBA) problem as an Markov Decision Process, implemented reinforcement learning algorithms to solve the NP hard problem in high dimensional action space.

MICROSOFT RESEARCH

Research Assistant (Full-time), Machine Learning Group

Beijing, China

2020 - 2021

- *Learning Multiple Trading Patterns*
 - Proposed a lightweight extensive module, temporal routing adaptor (TRA), to automatically dispatch samples into multiple domains and select a best predictor, applied optimal transport restrict balance assignments while keeping lowest overall loss;
 - Researched ablation studies on influence of number of domains, performance of hidden states and memory mapping combination, surpassed state-of-the-art baselines' RankIC by 1%, Annual Return by 3.1%.
- *Deep Risk Model*
 - Formulated risk mining as a supervised learning task and overcame fundamental and statistical risk models' s deficiency;
 - Put forward a deep learning solution (GAT-GRU) for mining risk latent factors to improve covariance matrix estimation;
 - Advanced cutting-edge performance in R^2 by 1.9%, manifested stability and explainability in model and objective design.
- *Representation Learning of Stock Data*
 - Plugged reconstruction loss in auto-encoder with clustering based pseudo labels, projected data into a linear separable hidden space, accomplished 3% enhancement to baseline (analogue to manifold clustering);
 - Applied a contrastive method in representing learning with optimal transport, exceeded benchmarks on downstream with 1st online clustering algorithm, achieved oracle accuracy on synthetic data (99%).
- *News Sentiment Analysis*
 - Filtered tags, tables and tokenized the Reuters news, match cleaned news to daily returns;
 - Forecasted stock movements with hierarchical embeddings from BERT model.
- *Qlib (1st open-source AI platform for Quant Finance)*: Released the TRA model and its baselines. (github.com/microsoft/qlib)

SUNSHINE QUANT INVESTMENT

Research Intern, Quantitative Research

Shenzhen, China

Spring 2020

- Built Black-Litterman portfolio optimization model with risk parity strategy as prior and adversarial learning predictions as posterior; enhanced index's return by approx. 4%, max drawdown by 30%.
- Constructed a GAN to empower LSTM's baseline by 2%, attained accuracy of 58% and MSE of 0.44%.
- Designed a data structure Numpy.NET in C# and allowed efficient functions in time series analysis model.

PUBLICATIONS

- **Lin H.**, Zhou D, Liu W, Bian J. Learning Multiple Stock Trading Patterns with Temporal Routing Adaptor and Optimal Transport. *In Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 21)*.
- **Lin H.**, Zhou D, Liu W, Bian J. Deep Risk Model: A Deep Learning Solution for Mining Latent Risk Factors to Improve Covariance Matrix Estimation. *In 2nd ACM International Conference on AI in Finance (ICAIF 21)*.