HENGXU (HUGH) LIN
(646) 236-8558 | helin23@gsb.columbia.edu | https://linhx25.github.io

EDUCATION

COLUMBIA BUSINESS SCHOOL New York, NY
MS, Financial Economics GPA: 9.6/10 08/2021 - 05/2023

Ph.D Coursework*:* Foundations of Optimization, Econometric I & II, Continuous Time Models and Methods
Ongoing Ph.D Coursework: Natural Language Processing, Dynamic Programming, Math Models in Marketing, Empirical Methods in Marketing
Course Assistant*:* Operations Management (Prof. Cyrus Mohebbi)

SUN YAT-SEN UNIVERSITY Guangzhou, China
BS, Mathematics and Applied Mathematics GPA: 3.9/4 08/2015 - 06/2020

Coursework*:* Neural Networks, Machine Learning, Probability Theory, Mathematical Statistics, Operations Research, Algebra, Real Analysis, ODE, PDE, Evolutionary Game Theory, Micro/Macro Economics, Organizational Behavior
Honors*:* Graduated with highest distinct (Top 0.5%)

PUBLICATIONS & CONFERENCE TALKS

- **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)*.
  - Conference presentation, SIGKDD 2021, August, Singapore (dl.acm.org/doi/10.1145/3447548.3467358)
  - Code: github.com/microsoft/qlib/TRA
- **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)*.
  - Conference presentation, ICAIF 2021, November, USA (dl.acm.org/doi/10.1145/3490354.3494377)

RESEARCH EXPERIENCE

Columbia Business School 09/2021 - Present
Research Assistant, MKT Science, Advisor: Prof. Asim Ansari & Prof. Kamel Jedidi

- **Textual Analysis**: Scrapped music information from Wikipedia to generate genres and construct topic model;
- **Music Impact (Ongoing)**: Analyzed similarity of nodes and distribution shift to understand music genealogy and impact.

Microsoft Research 06/2020 - 09/2021
Research Assistant, Machine Learning Group, Advisor: Dr. Weiqing Liu & Dr. Jiang Bian

- **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**
  - **Deep Clustering**: 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);
  - **Contrastive Learning**: 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%).
- **Qlib (1st open-source AI platform for Quant Research):** Released the TRA model and its baselines. (github.com/microsoft/qlib)

Sun Yat-sen University 02/2020 - 05/2020
Undergraduate Thesis, School of Mathematics, Advisor: Prof. Peixing Li

- Thesis: *The Black-Litterman Optimization with Generative Adversarial Networks*
- Built Black-Litterman model with risk parity strategy as prior and adversarial learning predictions as posterior; enhanced index's return by approx. 4%, max drawdown by 30% (github.com/linhx25/BlackLittermanModel);
- Constructed a GAN to empower LSTM's baseline by 2%, attained accuracy of 58% and MSE of 0.44%.

Sun Yat-sen University 12/2018 - 05/2019
Undergraduate Thesis (Best Paper), School of Business, Advisor: Prof. Keming Wang

- Thesis: *Readability, Opaqueness and Crash Risk*
- Developed a Python package to process firms' 10-K fillings (217G) and applied NLP methods for annual report textual analysis;
- Carried robustness test to eliminate endogeneity: searched alternative variables, tested fixed effect of panel data;
- Proved that 10-K fillings of high-risk firms are of low readability and high opaqueness. (github.com/linhx25/FReader).

Southern China Center for Statistical Science 02/2018 - 08/2018
Undergraduate Researcher, Department of Statistics, Advisor: Prof. Xueqin Wang

- **Numpy.NET**: Designed a data structure emulating Numpy in C# and allowed efficient functions in time series analysis model;
- **Hidden Markov Model**: Utilized the EM algorithm to estimate MSVAR's parameters. (github.com/linhx25/MarkovSwitching)

AWARDS & HONORS

J.P. Morgan Research Fellowship for the International Conference of AI in Finance 2021

Microsoft Research Stars of Tomorrow for outstanding research interns 2021

Sun Yat-sen University Outstanding Undergraduate (highest distinct, Top 0.5%) 2019

Sun Yat-sen University First Place Scholarship (Top in the class) 2017

PROFESSIONAL EXPERIENCE

Sunshine Quant Investment Management Shenzhen, China
Research Intern, Quantitative Research 02/2020 - 05/2020

- Deep learning research and portfolio optimization.

Morgan Stanley Huaxin Fund Management Shenzhen, China
Quantitative Analyst, Risk Management 05/2019 - 08/2019

- Performance attribution and fair trading analysis.

PROJECTS

Kaggle's PUBG Machine Learning Prediction (Ranked Top 1%)

- Conducted feature engineering and tested linear/non-linear models with regularization in pre-experiment;
- Implemented Random Forest, Genetic Algorithm, Particle Swarm and GBDT in Python for prediction, with 1.95% MAE;
- Ranked Top 1% in Kaggle's Project competition (kaggle.com/pubg-prediction , Team SYSU).

What Influences Firms' Cloud Migration?

- Investigated what factors restrict enterprises from using public cloud migration technology;
- Selected as a National Undergraduate Research project (2/43).

RESEARCH SKILLS

Deep Learning/Machine Learning: PyTorch, Tensorflow, Hugging-face Transformer
Programming*:* Python, Linux/Bash, C++, Java/C#, SQL, 60k+ lines programming experience

ADDITIONAL INFORMATION

Languages: Cantonese (Fluent), Mandarin (Native)
Interests: Hip-hop dance, Climbing (elevation 6,000 m), Cooking