

Chi-Lin (Jaden) LI

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EDUCATION

Boston University

Boston, MA

Master of Science in Mathematical Finance and Financial Technology

Sep. 2023 – Jan. 2025

- **Honors:** Dean's Achievement Scholarship
- **Courses:** Algorithmic and High-Frequency Trading, Financial Econometrics, Statistical Machine Learning, Computational Methods, Dynamic Portfolio Theory, Asset Pricing, Fixed Income, Credit Risk, Stochastic Calculus

National Tsing Hua University (NTHU)

Hsinchu, Taiwan

B.B.A. in Computer Science and Quantitative Finance, Minor in Data Science

Sep. 2018 – Jan. 2023

- **Honors:** Dean's Lists, Undergraduate Research Fellowship
- **Overall GPA:** 3.7/4.0, **Last 60 GPA:** 3.9/4.0
- **Courses:** Robust and Stochastic Portfolio Optimization, Derivatives Market, Macroeconomics, Time Series Analysis, Deep Learning, Mathematical Statistics, Algorithms, Data Structures, Data Mining, Operating Systems

EXPERIENCE

Quantitative Research Intern

Aug. 24 – Dec. 24

Blockhouse Capital

New York, NY

- Collaborated with a cross-functional team to perform TCA on government bonds, corporate bonds, and interest rate swaps, evaluating brokers based on price impact and conducting stress tests, like Value-at-Risk (VaR) analysis
- Applied OLS, Ridge, and Lasso to estimate execution costs and identify key drivers of bid-ask spreads in T-bonds

Quantitative Analyst Intern

Jun. 24 – Aug. 24

ASL Capital Markets Inc.

Stamford, CT

- Led a team to implement bond ETF hedging with futures contracts, improving the information ratio by **32%**
- Applied a duration-based approach and AR(1) model to predict components in the Nelson-Siegel yield curve

Quantitative Researcher

Jul. 22 – Feb. 23

National Tsing Hua University

Hsinchu, Taiwan

- Developed a custom systematic methodology that integrates Black-Litterman model, factor models, and Elastic Net regression for multi-period convex portfolio optimization; incorporated dynamic algorithm to adapt fluctuations
- Enhanced Sharpe ratio by **30%** and reduced drawdown by **37%** compared to the S&P 500 benchmark

Quantitative Trading Intern – Machine Learning Team

Feb. 22 – Jun. 22

Yuanta Securities

Taipei, Taiwan

- Forecasted equities' mid-price returns using LightGBM and Random Forest, applying feature engineering and improving predictive accuracy by **20%** through hyperparameter tuning with grid search and cross-validation
- Built a derivatives-based trading strategy pipeline, achieving **18.9%** annualized returns and reducing turnover rate

Data Scientist Intern

Jun. 21 – Oct. 21

Merck (MSD)

Taipei, Taiwan

- Utilized the ARIMA model to project anesthesia market growth, aiding in streamlined strategic decision-making
- Communicated with data teams to craft comprehensive tables, streamlining our long-term sales strategy

PUBLICATIONS

[1] **Chi-Lin Li*** and Chung-Han Hsieh, "On Unified Adaptive Portfolio Management," submitted to Journal of Quantitative Finance, 2024. (arxiv.org/abs/2307.03391v3)

RESEARCH PROJECTS

- Natural Language Processing for Financial Data Analysis** | *Boston, MA* Mar. 24 – Apr. 24
- Developed advanced machine learning models using Word2Vec, Sentence BERT, and RoBERTa to enhance text-based feature engineering, improving predictive performance in finance-related strategies
 - Optimized LightGBM, and XGBoost models to achieve precision, recall, and F1-score improvements of up to 15% by leveraging advanced embedding methods and natural language processing tools
- Risk Measurement in Fixed Income Portfolios** | *Boston, MA* Jan. 24 – Apr. 24
- Utilized dynamic factor and GARCH-type models to robustly predict bond returns and estimate the covariance matrix, improving out-of-sample VaR estimates
 - Developed a versatile risk management approach for fixed income securities, integrating various yield curve and volatility models to bridge gaps in existing financial research
- Timer Option Pricing and Dynamic Delta-Hedging** | *Boston, MA* Jan. 24 – Apr. 24
- Priced timer options in Python with Monte Carlo simulation and Heston models for volatility and interest rates
 - Conducted delta-hedging to achieve Sharpe Ratio of **1.23** and reduce the maximum drawdown to **9.74%**
- Dynamics of Pairs Trading** | *Boston, MA* Jan. 24 – Apr. 24
- Employed Vector Autoregression (VAR) model to analyze co-integration factors
 - Utilized Partial Differential Equations (PDEs) to formulate optimal entry and exit strategies, achieving a trade-off between risk and return through numerical computations and parameter optimization techniques
- Cointegration Alpha: A NASDAQ-100 Pairs Trading Strategy** | *Boston, MA* Jan. 24 – Mar. 24
- Developed a pairs trading strategy within the QQQ ETF universe to identify potential trading opportunities
 - Applied statistical tests, including the Johansen cointegration test and the ADF test, to isolate securities exhibiting mean-reverting price relationships
 - Leveraged daily data for calculating mid-prices and dynamically adjusting positions based on asset volatility
- Company Bankruptcy Prediction** | *Boston, MA* Jan. 24 – Mar. 24
- Addressed dataset imbalance by employing SMOTE for improved model reliability, and conducted hyperparameter optimization via GridSearchCV to enhance model performance
 - Implemented XGBoost, LightGBM, and Neural Network to achieve **97.80%** accuracy rate and **62.50%** F1-score
- Rotman International Trading Competition RITC 2024** | *Toronto, ON* Dec. 23 – Feb. 24
- Managed Algorithmic Market Making, CAPM, Option Volatility, ETFs, Commodities, and Electricity cases
 - Achieved **Top 5** US School ranking; executed algorithmic trading strategies to secure top 15 in all algorithm cases
- On Adaptive Reinforcement Learning in High-Frequency Trading** | *Boston, MA* Oct. 23 – Dec. 23
- Proposed a novel trading strategy combining Double Q-Network (DQN) and Gated Recurrent Unit (GRU) with a Sortino ratio-optimized sliding window algorithm and performance-based reward mechanism
 - Enhanced optimization, achieving a **37%** increase in Sharpe ratio and **41%** reduction in maximum drawdown
- Prediction of Suspected Money Laundering** | *Hsinchu, Taiwan* Oct. 22 – Dec. 22
- Achieved a precision score of **0.964** and an F1-score of **0.983** in predicting potential money laundering activity of public data using LightGBM by fine-tuning the hyperparameters of the gradient boosting machine
 - Conducted data preprocessing and feature engineering, including encoding customer information data, adding statistical values as features, and merging the customer information data with time series transaction-based data
- Human Race Classification** | *Hsinchu, Taiwan* Nov. 21 – Jan. 22
- Obtained **94%** accuracy in classifying human racial images using the CNN architecture-Inception-V3
 - Analyzed the performance of Inception-V3 and four other SOTA models and implemented Grad-CAM to clarify the reasons why the images were misclassified; heatmaps indicate regions of the face where certain features highlight

SKILLS AND CREDENTIALS

Programming Languages: Python, C/C++, R, SQL, Bloomberg Terminal, MATLAB, Linux, Git (All Advanced)
Languages: English (fluent), Mandarin (native)
Interests: Bridge, Basketball, Cinema, Music, History, Traveling, and Hiking