Chun Hung Tsang

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SUMMARY/OBJECTIVE

M.S. candidate in Applied Mathematics with training in fundamental investment research (Passed CFA Level III; CFA RC Champion) and quantitative finance. Master's research focuses on pricing and arbitrage models for cryptocurrencies and their options based on stochastic processes and deep learning in Python. Conducted government-funded empirical research at Academia Sinica on large-scale firm-level and financial datasets. Seeking a Quant internship role in quantitative research and analysis about trading.

INVESTMENT RESEARCH & PROFESSIONAL CREDENTIALS

CFA Institute Research Challenge (Taiwan) CFA Institute
Best Written Report Award 2024 – 2025

- Conducted in-depth analysis on chip architectures and AI-driven product mix and mapped identified growth drivers into explicit revenue, margin, and capital expenditure within forecasted financial statement.
- Incorporated industry structure and competitive positioning into relative valuation using forward-looking P/E multiples by defining global peers and justifying a valuation premium based on an estimated ~20% price advantage of flagship SoCs versus Qualcomm and MediaTek's early positioning in ASICs.
- Assessed 7 key value drivers and 7 risk factors and launched scenarios and sensitivity analyses.
- Built integrated financial projections and applied DCF model with assumptions on revenue growth (17.25% CAGR), margin trajectory, and capital intensity derived from industry analysis to derive target price.

Chartered Financial Analyst (CFA) CFA Institute
Level I - III Passed 2022

WORK & RESEARCH EXPERIENCE

Taishin International Bank – NSYSU Kaohsiung, Taiwan
Industry–Academia Collaboration 2025

- Orchestrated quantitative modeling and optimization design for a bank-sponsored project that analyzed 1.4 million customer-level transaction data across 200,000 customers.
- Applied XGBoost to predict purchase probabilities and delivered an average out-of-sample AUC of 0.82.
- Segmented customers using K-prototype clustering and identified the 5 most profitable customer segments.
- Achieved a 24.92% ROI and a 31.31% uplift in conversion rate of transactions under budget constraints.

Institute of Economics, Academia Sinica Taipei, Taiwan
Research Assistant 2018 – 2023

- Conducted econometric modeling and empirical analysis across 5 government-funded research projects.
- Engineered automated Python pipelines that processed 4.51 million census and administrative decision observations, along with 1.40 million household income and tax records from the Ministry of Finance.
- Derived 2 computationally efficient numerical equations that accurately resolve the analytically intractable decomposition of inefficiency and noise in stochastic frontier models, with applications in sample selection.

Well Job Cycle Manufactory Inc. Taichung, Taiwan
Project Manager 2017 – 2018

- Managed a US$890,000 production and triangular trade project and achieved a 42% operating margin.
- Reduced procurement costs by 14% through strategic vendor bargaining and market-based pricing analysis.
- Coordinated production across 35 suppliers with 52 bicycle parts to ensure on-time assembly and delivery.
- Administered multi-currency cash flows (USD, EUR, RMB, TWD), applying rule-based timing strategies to receivables and payables to mitigate currency exposure and optimize working capital.

QUANTITATIVE RESEARCH PROJECTS

Detecting and Modeling Jump Risk in Cryptocurrency and Option Pricing (Thesis) 2025 – Present

- Decomposed jump components in crypto return and volatility series by iterative robust time-series method.
- Constructed multi-layer dynamic networks from returns, volatilities, and jumps to quantify inter-layer and intra-layer contagion with their spectral properties and lead-lag mechanisms to study how shocks propagate.
- Formulated cryptocurrency option pricing models based on stochastic process dynamics and integrated empirically detected jump-diffusion parameters of return and volatility into pricing inputs.

Visual Graph Learning (CNN–GCN) for Financial Forecasting and Portfolio Optimization 2025

- Designed a deep learning pipeline by jointly modeling expected stock return signals via Convolutional Neural Networks (CNN) embeddings and cross-asset dependencies via Graph Convolutional Networks (GCN) propagation into optimal portfolio weights for alpha-driven trading.
- Implemented a data transformation process that converted Open-High-Low-Close time-series into candlestick image embeddings through CNN and extracted the predictive price patterns for trading signals.
- Introduced Graph Theory by constructing a Minimum Spanning Tree to capture the latent dependency structures among constituent stocks of Hang Seng Index under market noise filtration.

Two-Stage Algorithmic Trading: XGBoost–Enhanced Technical Signals 2025

- Built a dynamic meta-labeling architecture combining multiple technical signals (RSI, DMA, MACD) via an XGBoost meta-learner to decouple signal generation from execution for robust trade selection.
- Trained the model to validate signal quality based on peer strategy consensus and proprietary market context features and to filter out false positives across market regimes to substantially mitigate strategy decay.

Network Centrality–Adjusted Asset Allocation 2023 – 2024

- Interpreted centrality as systemic risk and managed exposure via peripheral stock selection in a network.
- Established a dynamic trading algorithm that switched the allocations between high-centrality assets and low-centrality assets under varying levels of market correlation intensity of the network developed.

Hierarchical & Density–Based Asset Allocation with Ensembling 2023 – 2024

- Developed a cluster-aware portfolio construction pipeline that employed Hierarchical Clustering to form correlation-consistent groups and used DBSCAN to identify unstable assets for concentration risk control.
- Proposed KNN-based stock selection module with Bagging to screen candidates with high profit potential.

EDUCATION

National Sun Yat-sen University Kaohsiung, Taiwan

Master of Applied Mathematics (Data Science) (GPA: 4.19/4.3) Jul. 2023 – Apr. 2026 (Expected)

Honors & Awards

- Ministry of Education Outstanding Overseas Chinese Graduate Student Scholarships (2024 – 2025)
- Graduate Student Scholarship, Department of Applied Mathematics (2023)

Relevant Coursework (59 Credits)

- **Mathematics**: Stochastic Process, Optimization Theory, Matrix Computation, Network Analysis
- **Statistics**: Time Series, Mathematical Statistics, Econometrics
- **Quantitative Finance**: Financial Mathematics, Financial Engineering, Trading Algorithms
- **Data Science**: Discrete Data Analysis, Regression Analysis
- **Computer Science & Artificial Intelligence**: Statistical Learning, Machine Learning, Deep Learning

SKILLS & LANGUAGES

Languages: English (TOEFL iBT 90, TOEIC 830), Mandarin (Proficient), Cantonese (Native)
Programming: Python (Scikit-learn, NetworkX, Statsmodels, PyTorch, PyMC), R, Stata, Bloomberg, LaTeX
Skills: Quantitative modeling, Statistical analysis, Machine learning, Trading strategy and algorithm design, Risk management, Financial modeling, Fundamental analysis, Technical analysis, Portfolio optimization