Mengfan Long

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Professional Summary

- Graduate student with a strong foundation in **mathematics**, **statistics**, **computer science**, and **financial econometrics**, with experience in **research**, **projects**, and **internships**. Skilled in **high-dimensional statistics**, **reinforcement learning**, and applying **system-level thinking** to **quantitative problems**.

Education

University of Michigan Ann Arbor, MI

Master of Applied Statistics *Expected May 2026*

- **Relevant Coursework: Machine Learning**, **Deep Learning**, **Reinforcement Learning**, **Probability Theory**, **Time Series**, **Statistical Theory**, **Stochastic Processes**, **Data Structures**, **Optimization**.

University of Queensland Brisbane, QLD

Bachelor of Economics in Econometrics (Honors) *Graduated Nov. 2023*

- **Honors: First Class Honors** (GPA: **3.85/4**), **Dean's Honor Roll** (Top 10%), **FitzGerald Scholarship**.

Professional Experience

Quantitative Trading Intern Jul – Sep 2022

Fx Trading Plus *Sydney, Australia*

- Designed and fine-tuned **statistical** and **deep learning models** (XGBoost, LSTM) for **short-term price prediction**, improving signal precision and boosting **Sharpe ratio** by **10%**.
- Developed and trained **reinforcement learning agents** (**PPO**, **DDPG**) in **FinRL environments** to optimize **portfolio rebalancing** under volatile market regimes, leveraging **reward shaping** and **policy iteration**.
- Engineered **transformer-based trading systems** for **dynamic position sizing**; deployed latency-efficient inference in **C++ with PyTorch bindings**, improving **risk-adjusted returns by 12%**.

Academic Projects

Research Assistant – High-Dimensional Discriminant and Copula Models Feb – Nov 2023

University of Queensland *Brisbane, Australia*

- Proposed and implemented a novel **discriminant analysis** method for **high-dimensional Gaussian mixtures** using **sparse EM** and **convex optimization**, addressing **non-normality** and **overfitting** in classical LDA/QDA.
- Extended the model with **copula-based dependence structures** to capture **nonlinear tail risk** and **marginal-joint separability** using**HD-GMCM** and **Statistical inference**.
- Outperformed **sparse LDA** and **lasso logistic regression** on both **simulated and real-world datasets**, achieving a **15–20% gain** in classification accuracy and improved **model stability** under high-dimensional settings.

Automated Trading System Apr – Aug 2025

Personal Project ***Code Repository***

- Architected and built a modular algorithmic trading framework tailored for **reinforcement learning** strategies, integrating **historical backtesting**, **PnL accounting**, and **risk-adjusted performance diagnostics**.
- Optimized **PPO** and **DDPG** agents for continuous action spaces with customized **reward shaping** (e.g., Sharpe boosting, drawdown regularization), yielding up to **15% gain in Sharpe ratio** over rule-based baselines.
- Implemented efficient inference layer with **C++/Python bindings**, enabling real-time deployment of PyTorch models and simulating end-to-end execution under latency and slippage stress tests.

Skills Summary

- **Computer Science: Machine learning**, **Deep learning**, **Reinforcement learning**, **Data structures and algorithms**; Completed **150+hard LeetCode problems** covering **DP**, **trees**, and **graph algorithms**.
- **Programming & Tools: Python**, **C++**, **R**, **SQL**, **MATLAB**; Experienced with **Git**, **GitHub**, **LaTeX**, **Linux**, **Docker**, **VSCode**, **Jupyter**, **PyTorch**, **TensorFlow**, and **Stata**.
- **Mathematics: Linear algebra**, **Optimization**, **Numerical methods**,**Analysis**, **copula-based modeling**.
- **Statistics: Bayesian**, **Time series**, **Statistical inference**, **Probability and Statistical theory**, **Regression**.