

# ZHENGLONG LI

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## RESEARCH INTERESTS

My research interests lie in the cross fields of AI and finance, with a focus on developing state-of-the-art AI algorithms to tackle practical financial problems including portfolio optimization, pair trading, alpha factor mining, sentiment analysis, etc. I have several years of research experience in AI techniques and applications like metaheuristics, deep reinforcement learning and multi-agent systems. I enjoy doing AI research in finance and making true impacts in the industry as a Quantitative/ML Researcher.

## EDUCATION

### The University of Hong Kong

Ph.D. in Electrical and Electronic Engineering

Hong Kong SAR

Sept. 2019 – Jun. 2025

Research Topic: Artificial Intelligence in Computational Finance

Thesis: Applications of Metaheuristics and Multi-Agent Techniques in Financial Portfolio Optimisation

Advisors: Dr. Vincent W.L. Tam and Prof. Lawrence K. Yeung

### The University of Hong Kong

M.S. in Electrical and Electronic Engineering (with Distinction)

Hong Kong SAR

Sept. 2018 – Aug. 2019

Dissertation: Research on the Impact of Listed Company Announcement Based on Natural Language Processing

Advisor: Dr. Vincent W.L. Tam

### Jinan University

Guangzhou, China

B.Eng. in Electronic Information Science and Technology (Rank Top 10%)

Sept. 2014 – Jun. 2018

B.Econ. in Finance (Financial Engineering)

Sept. 2015 – Jun. 2018

◊ Gained admission through National College Entrance Examination (GaoKao) in China, Top 2% in Guangdong Province.

## SELECTED PUBLICATIONS

### [1] A Multimodal and Sentiment-Based Trading System for Financial Portfolio Optimisation

Zhenglong Li, Vincent Tam, and Lawrence. K. Yeung.

- Designed a multimodal portfolio optimization framework by integrating financial language models and using confidence learning to carefully select valuable information from different news sources.
- *IEEE International Conference on Consumer Electronics (ICCE), 2025.*

### [2] Investor Preference-Aware Portfolio Optimization with Deep Reinforcement Learning

Zhenglong Li, Vincent Tam, and Lawrence. K. Yeung.

- Developed a constrained portfolio optimization framework that maximizes overall portfolio returns while satisfying different types of trading requirements from investors and stock exchanges by using heuristic search and deep reinforcement learning.
- *IEEE International Conference on Consumer Electronics (ICCE), 2025.*

### [3] Developing A Multi-Agent and Self-Adaptive Framework with Deep Reinforcement Learning for Dynamic Portfolio Risk Management

Zhenglong Li, Vincent Tam, and Lawrence. K. Yeung.

- Proposed a multi-agent optimization framework to effectively reduce investment risks while maximizing portfolio returns by the market observer, action planner and risk manager based on a new risk measure.
- *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS, top-tier conference in multi-agent systems, Accept Ratio: 229/883=25.93%), 2024.*

[4] **Developing An Attention-Based Ensemble Learning Framework for Financial Portfolio Optimisation**

Zhenglong Li and Vincent Tam.

- Applied transformer models and directional change analysis to extract spatial-temporal information of stocks from multiple granularities for managing portfolios.
- *International Joint Conference on Neural Networks (IJCNN), 2024.*

[5] **AdaGuIDE: An Adaptive and Guided Differential Evolution for Continuous Optimization Problems**

Zhenglong Li and Vincent Tam.

- Proposed an adaptive metaheuristic optimizer based on guided search to handle complex continuous optimization problems.
- *Applied Intelligence, Journal, 2024.*

[6] **A Hybrid Optimization Framework with Dynamic Transition Scheme for Large-Scale Portfolio Management**

Zhenglong Li and Vincent Tam.

- Designed a hybridized metaheuristic optimizer for solving large-scale portfolios based on Sharpe ratios.
- *Algorithms, Journal, 2022.*

[7] **AdaGuIDE+: Enhancing an Adaptive and Guided Differential Evolution Framework with Large Language Models for Financial Portfolio Optimization**

Zhenglong Li, Vincent Tam, and Lawrence. K. Yeung.

- Applied large language models and retrieval-augmented generation techniques to learn from latest market data for solving the CVaR-based portfolio problems without retraining and fine-tuning.
- *Journal Paper, Under Review.*

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## SELECTED PUBLICATIONS IN OTHER FIELDS

[1] **Oracle: QoS-aware Online Service Provisioning in Non-Terrestrial Networks with Safe Transfer Learning**

Shengyu Zhang, Songshi Dou, Zhenglong Li, Lawrence K. Yeung, and Tony Q.S. Quek.

- Aimed at optimizing the quality of services in networking like latency, throughput, and channel switch.
- *IEEE International Conference on Computer Communications (INFOCOM, top-tier conference in computer networking and communication, Accept Ratio: 272/1458=18.66%), 2025.*

[2] **Maintaining Predictable QoS for Online Service Provisioning in Non-Terrestrial Networks via Safe Transfer Learning**

Shengyu Zhang, Songshi Dou, Zhenglong Li, Lawrence K. Yeung, and Tony Q.S. Quek.

- *IEEE Transactions on Networking (ToN), Journal, 2025.*

[3] **SpaceCache+: Towards Pervasive Content Delivery via Low-Earth Orbit Mega-Constellations**

Songshi Dou, Shengyu Zhang, Zhenglong Li, Jinxian Wu, Xianhao Chen, and Lawrence K. Yeung.

- Targeted to reduce data transmission latency and save bandwidth in low-earth orbit satellite networks.
- *IEEE Transactions on Services Computing (TSC), Journal, 2025.*

[4] **A Coarse-to-Fine Grained Knowledge Refinement Framework for Network Intrusion Detection System**

Zhenglong Li, Vincent Tam, and Lawrence. K. Yeung.

- Designed a network intrusion detection system based on multi-granularity learning to prevent attacks.
- *IEEE Region 10 Conference (TENCON), 2022.*

## WORKING EXPERIENCE

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### The University of Hong Kong

*Postdoctoral Researcher*

Jul. 2025 - Present

- Customized the Large Language Model (LLM)-based chatbots in different education fields including engineering, law and finance by integrating multi-agent and Retrieval-Augmented Generation (RAG) techniques. The RAG techniques provide the latest data to LLMs for decision-making without retraining/fine-tuning LLMs, while the system can answer questions closely related to course materials of multiple formats.

### The University of Hong Kong

*Senior Research Assistant*

Jul. 2024 - Nov. 2024

- Assisted in customizing the LLM-based chatbots that guide students to learn in-depth in the courses.
- Designed a learning sequence recommendation system for teaching. By using language techniques to analyze the importance of concepts and their correlations in the courses, the system customizes the sequence of concept learning for different courses.
- The projects are closely collaborative with different faculties in the University of Hong Kong, including the Li Ka Shing Faculty of Medicine, Faculty of Engineering, and Philosophy Department.

### Hong Kong Applied Science and Technology Research Institute

*Project Intern (Machine Learning Track)*

Jul. 2020 - Oct. 2022

- In charge of the AI algorithm research in two projects. 1) Fine-grained Image Analysis: Proposed a multi-focus visual framework to recognize the species of objects. 2) Water Quality Forecasting: Designed a self-adaptive optimization framework for adapting water quality prediction models to different water regions. The projects both achieved the outstanding performance when compared to the latest models.
- Two patents were filed by the two projects. The projects are closely collaborative with the Hong Kong SAR government, including the Hong Kong Police Force, Water Supplies Department, and Social Welfare Department.

### The University of Hong Kong

*Research Assistant*

Sept. 2019 - Jun. 2020

- Analyzed domestic water usage data by using machine learning algorithms.

### Huawei Technologies Co., Ltd.

*Algorithm Intern*

Jul. 2019 - Aug. 2019

- Developed an optical character recognition framework based on ENAS (an AutoML framework) and evolution learning.

### Kingsoft Corporation (Seasun Game Subsidiary)

*Algorithm Intern*

May 2018 - Aug. 2018

- Investigated client authentication technology based on digital image signature. Two patents were filed by the projects.

## PATENTS

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- [1] An Application Authorization Method Based on Image Signatures, CN109815745A, Granted.
- [2] Fine-grained Visual Content Search Platform, US20230325434A1, Granted.
- [3] Self-Adaptive Optimization Framework for Water Quality Prediction, US2024295539A1, Granted.
- [4] Method and Device for Identifying Reported Screenshot, CN111368838A, Under Review.

## AWARDS AND HONORS

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1st Runner Up in Young Professionals Exhibition and Competition (Hong Kong)	2025
Merit Prize (4th Place) in IEEE (Hong Kong) Postgraduate Student Research Paper Competition	2024
Finalist in AI x HK Open Cup Competition (Top 8 of the 94 Teams)	2023
Two International Special Awards in International Invention Innovation Competition in Canada	2023
Gold Medal in 8th International Invention Innovation Competition in Canada	2023
A Silver Medal and A Bronze Medal in 48th Geneva International Exhibition of Inventions	2023
Third Price in China (Hengqin) International University Quantitative Finance Competition	2020
Merit Prize on Hong Kong University Student Innovation and Entrepreneurship Competition	2019
Wong Kin Hang Fund Scholarship (The only awardee in the school)	2017
Honorable Mention in the Mathematical Contest in Modeling	2017
First Prize China Undergraduate Mathematical Contest in Modeling (Guangdong Region)	2016
Excellent Student Representative of JNU	2016
First/Second/Third Class Excellent Student Scholarship of JNU	2015 - 2017
Annual Excellent Member of Student Union	2015

## TECHNICAL SKILLS

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<b>Language Skills</b>	Mandarin (Native), Cantonese (Native), English (Fluent)
<b>Programming Skills</b>	Python, Matlab, MySQL, PyTorch, etc.
<b>Tools</b>	LaTeX, Linux, Git, Docker, etc.