

Weizhi Liu

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Education

National University of Singapore :: Industrial Systems Engineering & Management

Singapore

Ph.D. in Multi-objective Simulation Optimization

Aug 2014 - Nov 2018

- Research Topics: Optimal Computing Budget Allocation, Ranking and Selection, Randomized Search, Stochastic Optimization.
- Relevant Courseworks: Optimization, Probability and Statistics, Randomized Algorithms, Stochastic Process.

Nanjing University :: Management Science and Engineering

Nanjing, China

B.Econ in Financial Engineering; B.Eng in Industrial Engineering

Sep 2010 - Jun 2014

- Relevant Courseworks: Financial Econometrics, Financial Engineering, Financial Microstructure, Financial Risk Management.

Experience

National University of Singapore

Singapore

Research Fellow, Centre of Excellence in Modelling and Simulation for Next Generation Ports

Oct 2018 - Present

- Led a research team to propose efficient simulation budget allocation strategies for binary classification with noisy labels to guarantee probability of false classification decays to zero at exponential rate.
- Participated in NOL Fellowship programme to develop an automatic stowage planning software with a guarantee for ship stability and efficient operations for the fourth-largest container shipping group (CMA CGM) which are expected to save millions of dollars cost.

WorldQuant LLC

Singapore

Research Consultant (Part-Time Quantitative Researcher)

Sep 2018 - Oct 2019

- Adopted advanced statistical and machine learning techniques to analyze various data sources on WorldQuant Websim to systematically designed and implemented near 400 quantitative trading strategies using python and in-house expression language to seek statistical arbitrage opportunities in the US, European and Asian equity markets.
- Analyzed these trading signals in 10-years backtesting period and found most strategies share high Sharpe ratios (~ 2.2), stable annualized returns ($\sim 10\%$), low maximum drawdown ($\sim 2\%$) and promising out-of-sample performance. Some trading strategies perform quite well in highly liquid stock universes (e.g., Russell top 200, Asia top 150).
- Created a top strategy that has one and a half year out-of-sample Sharpe ratio 5.26, 15.40% annualized return, and ten-year in-sample Sharpe ratio 3.47, 13.63% annualized return, see <https://tinyurl.com/rdof4ob> for more information.
- Ranked the 1st place in region of China and Singapore, and top 10 in world for WorldQuant Spring Alphathon, 2017.

Martian Capital Management PTE. LTD.

Singapore

Quantitative Researcher Intern

Mar 2018 - Sep 2018

- Developed an automatic signal-generation framework in python to find promising indicators relevant to forward return of month-1 futures of WTI / Brent Crude / Heating Oil / RBOB Gasoline / Gasoil based on 10 years weekly fundamental data and daily price data.
- Generated a detailed report automatically via LaTeX to visualize indicators' profile including 1) time series, distribution, and [partial] autocorrelation graphs; 2) information coefficient decay with different forward and backward returns; 3) prediction power by regression and stratification; and 4) historical performance in a rolling window.
- Established a flexible backtesting framework in python to cross-validate out-of-sample performances of different multi-period trading strategies and respective hyper-parameters which led to a machine-learning-based multi-factor directional strategy with three years out-of-sample Sharpe ratio 1.4.

ADVANCE.AI

Singapore

Data Scientist Intern

Jul 2017 - Oct 2017

- Designed and implemented two graph-based anti-fraud algorithms (community and anomaly detection) for GoJek in Hive SQL and pySpark to identify fraudulent drivers / customers with abnormal topological structures in co-occurrence graphs.
- Deployed anti-fraud algorithms into production which can identify hundreds of scammers daily by investigating millions of ride orders in less than one minute and created Tableau and Gephi dashboards to visualize communities of scammers.
- Conducted feature engineering and applied isolation forest, ensemble supervised learning, and natural language processing methods to predict fraudulent and abnormal scores for email addresses dataset with AUC above 70%.

Skills

- **Programming:** Python, C++, Matlab, R, SQL, Git, Linux, Shell Scripting, \LaTeX .
- **Languages:** Mandarin Chinese (native), English (fluent), Japanese (beginner).

Honors & Awards

Jan 2019 **Passed FRM Part 2**, Global Association of Risk Professionals
Aug 2018 **Passed CFA Level I**, CFA Institute
Apr 2017 **Gold Medal**, WorldQuant Global Alpha Building Competition
Mar 2017 **Level 5 (Finalist)**, Google FooBar Coding Challenge
May 2014 **Graduate of Excellence**, Nanjing University
Feb 2013 **INFORMS Paper Award (0.04%, 2/5536)**, The Mathematical Contest in Modeling
Feb 2013 **Outstanding Winner (0.2%, 11/5536)**, The Mathematical Contest in Modeling

Publications

- [1] Weizhi Liu*, Siyang Gao, and Loo Hay Lee. A partition-based random search for multi-objective optimization via simulation. Under Review, 2019.
- [2] Louis Douge, Chenhao Zhou*, Weizhi Liu, Yanchunni Guo, Loo Hay Lee, and Ek Peng Chew. Online vehicle routing under stochastic demands using reinforcement learning. Under Review, 2019.
- [3] Weizhi Liu*, Haobin Li, Hui Xiao, Loo Hay Lee, and Ek Peng Chew. Optimal computing budget allocation for binary classification with noisy labels and its applications on simulation analytics. In *Proceedings of the 2019 Winter Simulation Conference*. IEEE, 2019.
- [4] Juxin Li, Weizhi Liu*, Giulia Pedrielli, Loo Hay Lee, and Ek Peng Chew. Optimal computing budget allocation to select the non-dominated systems - a large deviations perspective. *IEEE Transactions on Automatic Control*, 2018.
- [5] Chenhao Zhou*, Haobin Li, Weizhi Liu, Stephen Aloisius, Loo Hay Lee, and Ek Peng Chew. Challenges and opportunities in integration of simulation and optimization in maritime logistics. In *Proceedings of the 2018 Winter Simulation Conference*, pages 2897–2908. IEEE, 2018.
- [6] Weizhi Liu*, Siyang Gao, and Loo Hay Lee. A multi-objective perspective on robust ranking and selection. In *Proceedings of the 2017 Winter Simulation Conference*, pages 2116–2127. IEEE, 2017.
- [7] Weizhi Liu, Juan Li*, Di Zhang, and Wei Chen. Fairness’s effect on the pricing decisions of the supply chain. *Journal of Management Sciences in China*, 20(7):115–126, 2017.
- [8] Cenying Yang, Wei Chen, and Weizhi Liu*. Make wise use of every drop. *Mathematical Modeling and Its Applications*, 2(5–6):75–89, 2013.
- [9] Cheng Ji*, Weizhi Liu, and Huiwen Chen. Verification of option parity relations in domestic warrants market of china. In *Proceedings of 2013 3rd International Conference on Social Sciences and Society(ICSSS 2013)*, 2013.
- [10] Cheng Ji*, Mengyi Niu, Weizhi Liu, and Jinyang Han. Joint distribution center model in university community. *China Journal of Commerce*, 11:091, 2013.

Additional Information

- **Interests:** Badminton, Go (Weiqi), Gwent, Swimming.
- **Miscellaneous:** Singapore Permanent Resident.