

# Weizhi LIU

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## Education

### National University of Singapore | Department of Industrial Systems Engineering and Management

Singapore

#### MULTI-OBJECTIVE SIMULATION OPTIMIZATION, PH.D. CANDIDATE

2014.08-Present

- Research Topic : Optimal Computing Budget Allocation, Random Search, Simulation Analytics, Discrete Event Simulation.

### Nanjing University | School of Management and Engineering

Nanjing, China

#### INDUSTRIAL ENGINEERING, B.ENG. ; FINANCIAL ENGINEERING, B.ECON.

2010.09-2014.06

- Core Modules: Econometrics, Financial Engineering, Structured Finance, Financial Markets Microstructure, Financial Risk Management, Corporate Finance, Equity Analysis, Fixed Income Securities; Operations Research, Operations Management, Supply Chain Management.

## Experience

### WorldQuant LLC

Singapore

#### RESEARCH CONSULTANT (QUANTITATIVE RESEARCHER)

2018.08-Present

- Developed 300++ quantitative trading strategies on the WorldQuant's WebSim platform to seek abnormal returns (or alpha) in the U.S. markets (Russell top 3000).
- The idea of my strategies comes from the utilization of various data sources (e.g., price/volume for equity, fundamental data, analyst estimate data, and sentiment data).
- Most strategies have high Sharpe ratios (~2.2), stable annualised returns (~10%, after neutralisation), low maximum drawdown (~2%) and moderate daily turnover (~18%).
- One among the top strategies has one-year out-sample Sharpe ratio 3.41 and five-year in-sample Sharpe ratio 2.52, see <http://greenwicher.com/me/misc/stock-long-short-trading-strategy.pdf>.
- Some trading strategies perform quite well even in a highly liquid stock pool (e.g., Russell top 200).
- Ranked the 1st place in the region of China and Singapore for the WorldQuant Spring Alphathon, 2017.
- Best Record: top 10 in the world.

### Martian Capital Management PTE. LTD.

Singapore

#### QUANTITATIVE RESEARCHER INTERN

2018.03-Present

- Developed an automatic framework in Python to identify and visualize promising leading indicators for the prediction of the forward return of month-1 future contract of WTI/Brent Crude/Heating Oil/RBOB Gasoline/Gasoil.
- Developed a flexible backtesting framework in Python to cross-validate various multi-period strategies (and hyper-parameters) and generate a detailed tear sheet report via LaTeX.
- Developed several multi-factor long-short trading strategies with three years out-of-sample Sharpe ratio 1.4++ based on machine learning methods.

### ADVANCE.AI

Singapore

#### DATA SCIENTIST INTERN

2017.07-2017.10

- Proposed two graph-based anti-fraud algorithms (community and anomaly detection) for GoJek (an Indonesian company) in Hive SQL and Spark to identify fraudulent drivers/customers with abnormal topological structures in the co-occurrence graph.
- Deployed Tableau/Gephi dashboard to visualize the community of fraudulent drivers/customers.
- Conducted feature engineering and applied isolation forest, ensemble supervised learning to provide fraudulent and abnormal scores for the given email addresses.

### PyPRS

Singapore

#### DESIGNER & DEVELOPER

2016.03-2017.05

- Proposed Partition-based Random Search (PRS) algorithm in Python to solve multi-objective optimization via simulation.
- Designed the architecture of the PRS algorithm.
- The components and test problems of the algorithm are encapsulated based on the object-oriented paradigm.
- Adopted SWIG to integrate the core code written in C++ with the Python main program to speed up the program's running efficiency.
- Visualized the search dynamics of PRS algorithm.
- <https://github.com/Greenwicher/PyPRS>

## BiblioPy

Nanjing, China

DEVELOPER

2014.04-2014.05

- Proposed an algorithm in Python to discover the knowledge graph for a research field by the co-occurrence and clustering methods.
- Implemented TF-IDF and TextRank to conduct the NLP analysis of the literature data and identify the key research topics of each academic community.
- Developed an automatic report generation tool via LaTeX and the visualization tool for Gephi.
- <https://github.com/Greenwicher/BiblioPy>

## Honors & Awards

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- 2018.08 **CFA Level I Candidate**, CFA Institute
- 2018.01 **FRM Part 1 Candidate**, Global Association of Risk Professionals
- 2017.04 **Gold Medal**, WorldQuant Global Alpha Building Competition
- 2017.03 **Level 5 (Finalist)**, Google FooBar Coding Challenge
- 2014.05 **Graduate of Excellence**, Nanjing University
- 2013.02 **INFORMS Paper Award (0.04%, 2/5536)**, The Mathematical Contest in Modeling
- 2013.02 **Outstanding Winner (0.2%, 11/5536)**, The Mathematical Contest in Modeling
- 2011/2012 **Outstanding Volunteer**, The 4th, 5th “Caring for China” - the Google China Social Innovation Cup

## Publications

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- [1] 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.
- [2] 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*. IEEE, 2018.
- [3] 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*. IEEE, 2017.
- [4] Weizhi Liu\*, Siyang Gao, and Loo Hay Lee. A partition-based random search for multi-objective optimization via simulation. Under Review, 2017.
- [5] 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.
- [6] Cenying Yang, Wei Chen, and Weizhi Liu\*. Make wise use of every drop. *Mathematical Modeling and Its Applications*, 2(5–6):75–89, 2013.
- [7] 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.
- [8] Cheng Ji\*, Mengyi Niu, Weizhi Liu, and Jinyang Han. Joint distribution center model in university community. *China Journal of Commerce*, 11:091, 2013.