# LUOFENG (EDWARD) ZHOU

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## Education Background

**Columbia University, The Fu Foundation School of Engineering and Applied Science** **New York, NY**
**Expecting M.S.** *in Financial Engineering* ***Aug. 2019 – Dec. 2020***

**Wuhan University, Economic and Management School & School of Computer Science** **Wuhan, China**
***B.A.*** *in Economics,* ***B.S.*** *in Mathematics,* ***B.Eng.*** *in Computer Science & Technology* ***Sep. 2015 – Jun 2019***

- **Cumulative GPA: 3.85/4.0.**
- **Relevant Coursework:** Mathematical Analysis, Linear Algrbra, Probability Theory & Mathematical Statistics, Advanced Microeconomics, Advanced Econometrics, Time Series Analysis, Corporate Finance, Options, Futures and Derivatives, Object-Oriented Programming, Analysis and Design of Algorithms.

## Academic Projects

**Interdisciplinary Research Project** **School of Computer Science, Wuhan University, China**
*Participated in an interdisciplinary research focusing on big data indicators for financial fraud* ***Sep. 2017 - Dec. 2017***

- We tried to use big data method to detect fraudulent financial statement of listed companies in US and China separately.
- We specified that sentimental elements gained by text mining instruments such as basic discrete bags of words model, modern Word2Vec model and Latent Dirichlet Allocation (LDA) model in annual reports (10-Ks in US) have significant indicator effect of fraudulent financial statements in the same year clustered by the same accounting firm. Plus, traditional machine learning models like SVM also perform a good predicative power.
- We also found that before and after the accounting criteria changed, the effect of fraudulent financial statements on stock prices differs drastically both in scope and in scheme.
- Contribution: Leader of financial part; applied the output which text mining or machine learning models with financial intuitions and previous researches, combined the newly formed variables with pure financial ones to conduct regressions in financial markets and compare the effects before and after these variables are added.

**Empirical Financial Research** **Economics and Management School, Wuhan University, China**
*Led a financial research focusing on short sellers' information sources around trading halts* ***Dec. 2017 – Jun. 2018***
***"Are Short Sellers Informed? Evidence from the Short-selling Activities before Stock Trading Halts", under review***

- Informed trading appears before private information. Short-selling indicates confidence of investors stronger than normal selling actions. Abnormal short-selling then shows trades with private information, which might contribute to the market disorder and inefficiency.
- We found that the private information around trading halts explained much of the short-selling in Chinese listed company by comparing the abnormal short-selling with normal short-selling, in which information-abundant and moderate duration shows more insider trading and vice versa.
- Contribution: Co-author; collected previous research to attest the contribution of the idea, did all the empirical experiments, wrote the draft paper.

**Interdisciplinary Research** **School of Computer Science, Wuhan University, China**
*Participated in an interdisciplinary research focusing on the empirical causal inference* ***Jun. 2018 - Sep. 2018***
***"Compression and Causal Relations Around Macroeconomics: an Improved CUTE Model"***

- Traditional Granger causality test preserves many demerits, so it is not always used in recent years. There are two ways to detect causality in time series data: use an appropriate instrument variable and structure equations; develop another model in detecting causality. In this project we used a newly developed model, CUTE, to do causal inference in Canadian macroeconomy.
- The original CUTE model is applied to binary time series while economic variables are multivalued. We perform a multi-value expansion to let the original one fit the macro-economy. Theoretical and robustness tests are done to show the benefits of improved CUTE model with respect to traditional Granger causality test.
- From empirical data, the improved CUTE model shows a somewhat different results, which may provide advises on macroeconomic policies from a different perspective.
- Contribution: Leader of the economic part; testified the contribution of the idea in macroeconomic scale, selected variables before tests are done according to previous research, drafted the paper.

**Coursework Thesis** **Economics and Management School, Wuhan University, China**
*Participating in a coursework thesis on the third party's behavior for principal-agent problem* ***Jul. 2018 -Sep. 2018***
***"Information Disclosure and Competitive Equilibrium in Capital Market"***

- Traditional principal-agent problem does not assume the existence of a third part or simply assume their utility to be the

same with one of the two sides. However, lots of cases tell that the third part such as sales manager play an important part in principal-agent problem with a unique utility function, which determines the degree of information asymmetric.

- In this paper, we tried to form theoretical explanation of the mechanism where a third party with unique utility function is involved and then characterize the behavior boundaries through Monte Carlo simulation and numerical specification for the final equilibrium.
- Contribution: Second author; derived part of the theoretical proof and did all the empirical tests, drafted the paper.

**Theoretical Data Mining Research** **School of Computer Science, Wuhan University, China**

*Leading a data mining research focusing on causal inference model for time-variant systems* ***Sep. 2018- Feb. 2019***

***"DMD: Discovering Time-Variant Temporal Dependence Using Predictive Codelength"***

- In general, Granger causality test, the most well-known model for temporal dependence mining, assumes that data from the same source should obey a same kind of autoregressive data generating process (DGP). However, under this assumption, the model fails to explain time dependence when facing structural changes like exogenous shocks.
- In this paper, based on the framework of Granger causality, every point from the same source is assumed to be independently generated but the parameters of their DGP is highly related. Specifically, like many research on time-variant system, we assume these parameters are shortly stable and able to forecast to explain auto-correlations.
- Our statistics, based on information theory, measures the certainty of a time series and is additive, thus capable to analyze the time-variant temporal dependence. Experimental results are promising both in precision and recall.
- Contribution: First author and the leader of the whole research group; formed the idea and drafted the paper; designed the algorithms and proved the theorems used in this paper; designed all the experiments.

**Interdisciplinary Research** **Institute of Interdisciplinary Information Sciences, Tsinghua University, China**

*Leading an interdisciplinary research focusing on financial causal networks and AI traders* ***Jun. 2019 - Ongoing***

- In the world of machine learning (ML) focusing on the accuracy of forecast, if the system is time-invariant, it seems no need for causality or causal graph to attain a good and stable performance. While the system is time-variant such as financial markets, ML always exhibits overfitting. Thus, when designing AI traders, a graphical causal convolutional network should be established to direct machine to learn "the rule of the rule".
- We first used simple instruments such as LASSO and XGBoost to form the dynamics in training set and implement reinforcement learning to evaluate test set's information coefficient (IC).
- Next, some features extracted through Fourier transform and other signal processing methods will be added to the original model. Attention mechanism will also be introduced to traditional recurrent neural network and the graphical causal convolutional network will substitute LASSO to evaluate the dynamic financial causality.

# Internship Experience

**Changjiang Securities** **Wuhan, China**

**Quant Intern**, Department of Asset Management ***Jul. 2016 - Aug. 2016***

- Researched on traditional multifactor model in security selection and its performance especially in Chinese pharmaceuticals industry.
- Researched on three biggest Chinese listed companies in pharmaceuticals industry; assessed entire pharmaceuticals industry by analyzing information from sentiments of media and investor.
- Added sentimental factors obtained by big data method to traditional multifactor model for better adaptation to Chinese market.

**China Universal Asset Management Co., Ltd** **Shanghai, China**

**Customer Analysis Intern**, Department of Wealth Management ***Jul. 2017 - Aug. 2017***

- Analyzed concerns of high net worth clients (HNW clients) during the past decade, development of private banking service in Chinese market, and planning scheme to establish private banking group.
- Formed a modified multi-factored model by including special characteristics of HNW clients' concern and their changes to provide more favorable portfolios.

**Panda Capital** **Beijing, China**

**Investing Intern**, Department of Investment ***Jul. 2018 - Aug. 2018***

- Investigated a series of entrepreneurship programs around AI and medical care.
- Parsed sales and remark data from e-commercial platforms in objective fields.
- Summarized founders' past experience of venture capital program to streamline decision making for a new program.

# Miscellaneous

- **Languages:** Mandarin (native), TOEFL: 106/120.
- **Programming skills:** proficient in MATLAB, R, STATA, JAVA, PYTHON, SQL.
- **Hobbies:** Table Tennis and Music.

***(Last revised: Aug. 4 th, 2019)***