Zhiyuan Yao

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Education

- **Stevens Institute of Technology** — Hoboken, NJ
  Master of Science in Financial Engineering; — *Expected May. 2019*
  GPA: 4.0/4.0
- **Nankai University** — Tianjin, China
  Bachelor of Science in Mathematics and Applied Mathematics; — *Aug. 2013 – Jun. 2017*

Experience

- **Hanlon Financial System Lab** — Hoboken, NJ
  Research Assistant and Instructor — *Sep 2017 - Present*
  - **Research assistant**: Research on deep reinforcement learning (RL), developing ROS-based distributed simulation system for RL, implementing RL algorithms (PPO, Q-Plan, etc.) and controlling robotic agents across internet by RL models.
  - **Instructor for *FE520 Introduction to Python for Financial Applications***: This course includes basic Python syntax, Scientific computation package (Numpy, Pandas, etc.), ML frameworks (Tensorflow, Scikit-learn) and basic design patterns.
- **Stevens Institute of Technology & Clearpool Group** — Hoboken, NJ
  Graduate Researcher — *Mar 2018 - Present*
  - **Graduate Researcher**: Research on darkpool liquidity detection. Re-sampling data from imbalanced data; Selecting features from categorical and continuous data (Target encoding, Mutual information); Using ensemble machine learning techniques (Stacking, Boosting) to predict liquidity; Evaluating liquidity signals generated by last order in different venues.
- **WorldQuant, LLC** — Beijing, China
  Intern and Virtual Quantitative Researcher — *Jun 2016 - Nov 2017*
  - **Intern**: Research on technical alpha strategies for stocks with top liquidity in U.S. stock market.
  - **Virtual Quantitative Researcher**: Developing alpha strategies based on fundamental analysis and analytical data. Applying machine learning algorithms to alpha strategy development on web based strategy backtesting system.

Selected Projects

- 09/2017 - Present | **Robotics Applications Platform Integrated Development (RAPID):** Objective of this project is to create a intelligent system which can control both simulated and physical robot. This system allows user to control agents across internet and to stream camera input from agent to control side. It is compatible with ROS interface and is a perfect simulation system for testing reinforcement learning algorithms on vanilla and partial-observed locomotion tasks. Some main-stream RL algorithms have been implemented and tested on our system.
- 09/2018 - Present | **10-k Fraud Detection by Text Analysis and Deep Learning:** Evaluating the probability that a company may fraud on its 10-k form by analyzing 10-k text description. This analysis will give a list of words/phrases that implies fraud statement. Marking paragraphs that are highly likely to be fraud by attention model.
- 03/2018 - Present | **Dark Pool Liquidity Detection:** Use re-sampling technique to generate effective data from highly unbalanced data. Selecting features from categorical and continuous data (Target encoding, Mutual information), using ensemble machine learning techniques (Stacking, Boosting) to predict liquidity. Evaluating liquidity signals generated by last order in different venues. Using reinforcement learning approach to detect transition pattern of liquidity. [PDF]
- 11/2016 - 05/2017 | **Quantitative Investment with Machine learning:** Creating Multi-factors Stock Selection Model based on Random Forest; Doing feature selection from P&V, fundamental, analytical fields by RankIC and t-test. Dynamically training model and forecasting in Chinese stock market. [PDF in Chinese]
- 10/2016 - 01/2017 | **Application and Modification of BP Neural Networks in hand-writing number Recognition:** Solving divergence and convergence in local minima issues of multi hidden layers neural network by adding momentum and penalty to loss function; Auto selecting learning rate to speed up training process by optimization techniques like Armijo rule.
- 01/2017 | **Interdisciplinary Contest in Modeling:** Analysis the long and unpredictable security checking time problem in U.S. airport with both Queuing Model (M/Ek/1) and Monte-Carlo simulation. Giving practical suggestion about dynamic operation strategy on airport security checking. [PDF]
- 02/2016 - 05/2016 | **Assessment on Pseudo-random Number Generators:** Implementing, testing and statistical analyzing the performance and randomness of major families of generators.[PDF in Chinese]
- 02/2016 | **Water Supply Ability Assessment Model:** Doing feature selection by Topsis method to find factors that affect water supply ability from thousands of factors. Predicting the change of such ability by Grey Prediction. [PDF]
- 09/2015 | **Identification of Geographical Location from Sun Shadow:** This model, which consists of Sun altitude model and solid geometry, can identify a location by a sequence data of shadow. Global and local optimal parameters is found by gradient descent.

Skills

- **Languages**: Python, C++, R, SQL, Matlab
- **Operating System**: Windows, Linux

Awards

- 08/2017 | **Master's Fellowship Award,** Stevens Institute of Technology
- 05/2017 | **Merit Student& Student Cadre Award,** Nankai University
- 04/2017 | **Meritorious Winner,** Interdisciplinary Contest in Modeling, awarded by COMAP
- 05/2016 | **Gold Medal (Global Rank: 62),** WorldQuant Challenge, WorldQuant LLC
- 04/2016 | **Honorable Mention,** Interdisciplinary Contest in Modeling, awarded by COMAP
- 10/2015 | **1st Prize,** China Undergraduate Mathematical Contest in Modeling, awarded by Chinese Ministry of Education & China Society for Industrial and Applied Mathematics
- 12/2014 | **Outstanding Chairman,** Student Union, Nankai University
- 05/2014 | **Excellent Teenager in Sport,** Tianjin Municipal Education Commission
- 11/2013 | **3rd-Class University Scholarship,** Nankai University