ZHIYUAN YAO

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Profile

I am a student of Mathematics from China with a strong interest in finance. I am currently completing a Master of Science in Financial Engineering and seek to continue my studies on a Ph.D program at Columbia.

- Competent and skilled programmer in Python, C++, R, SQL, Matlab.
- Excellent ability in Windows and Linux.
- Extensive experience translating theoretical knowledge onto practical, real-world projects.
- Wide-ranging research experience; proven ability to work within teams to cooperatively achieve goals.

Education

Expected 05/2019 **STEVENS INSTITUTE OF TECHNOLOGY**, HOBOKEN, NJ
Master of Science in Financial Engineering;
GPA: 4.0/4.0

08/2013 – 06/2017 **NANKAI UNIVERSITY**, TIANJIN, CHINA
Bachelor of Science in Mathematics and Applied Mathematics;
GPA: 82/100; Rank: 35/88

Experience

09/2017 - Present RESEARCH ASSISTANT & INSTRUCTOR **HANLON FINANCIAL SYSTEM LAB** , HOBOKEN, NJ

- Research on deep reinforcement learning (RL).
- Developing ROS-based distributed simulation system for RL.
- Implementing RL algorithms (PPO, Q-Plan, etc.)
- Controlling robotic agents across internet by RL models.
- Instructor for *FE520 Introduction to Python for Financial Applications*

05/2018 - Present GRADUATE RESEARCHER **STEVENS INSTITUTE OF TECHNOLOGY & CLEARPOOL GROUP** , HOBOKEN, NJ

- 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.

06/2016 - 11/2017 INTERN AND QUANTITATIVE RESEARCH CONSULTANT **WORLDQUANT LLC** , BEIJING, CHINA

- Research on technical alpha strategies for stocks with top liquidity in U.S. stock market.
- Developing alpha strategies based on fundamental analysis and analytical data.
- Applying machine learning algorithms to alpha strategy development on web based strategy back-testing system.

Selected Projects

09/2017 - Present **ROBOTICS APPLICATIONS PLATFORM INTEGRATED DEVELOPMENT**

- Create an intelligent system which can control both simulated and physical robot.
- Allow 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 FORM FRAUD DETECTION BY TEXT ANALYSIS AND DEEP LEARNING**

- Evaluate the probability that a company may fraud on its 10-k form by analyzing 10-k text description.
- Give a list of words/phrases that implies fraud statement.
- Mark paragraphs that are highly likely to be fraud by attention model.

03/2018 - Present **DARK POOL LIQUIDITY DETECTION**: [PDF]

- Used re-sampling technique to generate eective data from highly unbalanced data.
- Selected features from categorical and continuous data (Target encoding, Mutual information).
- Used ensemble machine learning techniques (Stacking, Boosting) to predict liquidity.
- Evaluated liquidity signals generated by last order in dierent venues.
- Used reinforcement learning approach to detect transition pattern of liquidity.

11/2016 - 05/2017 **QUANTITATIVE INVESTMENT WITH MACHINE LEARNING**: [PDF in Chinese]

- Created Multi-factors Stock Selection Model based on Random Forest.
- Selected features from P&V, fundamental, analytical fields by RankIC and t-test.
- Dynamically trained model and forecasting in Chinese stock market.

10/2016 - 01/2017 **APPLICATION AND MODIFICATION OF BP NEURAL NETWORKS**

- Solved divergence and convergence in local minima issues of multi hidden layers neural network by adding momentum and penalty to loss function.
- Selected learning rate automatically to speed up training process by optimization techniques like Armijo rule.

01/2017 **INTERDISCIPLINARY CONTEST IN MODELING**: [PDF]

- Analyzed the long and unpredictable security checking time problem in U.S. airport with both Queuing Model ($M/E_k/1$) and Monte-Carlo simulation.
- Gave practical suggestions about dynamic operation strategy on airport security checking.

02/2016 - 05/2016 **ASSESSMENT ON PSEUDO-RANDOM NUMBER GENERATORS**: [PDF in Chinese]

- Implemented and statistically analyzed the performance and randomness of major families of uniform-distributed generators.

02/2016 **WATER SUPPLY ABILITY ASSESSMENT MODEL**: [PDF]

- Selected features by TOPSIS method to find factors that aect water supply ability from thousands of factors.
- Predicted the change of such ability by Grey Prediction.

09/2015 **IDENTIFICATION OF GEOGRAPHICAL LOCATION FROM SUN SHADOW**

- Identified a location by a sequence data of shadow using a hybrid model of sun altitude model and solid geometry.
- Found the global and local optimal parameters by gradient descent.

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, COMAP

05/2016 **GOLD MEDAL**, WORLDQUANT CHALLENGE, WORLDQUANT LLC

04/2016 **HONORABLE MENTION**, INTERDISCIPLINARY CONTEST IN MODELING, COMAP

10/2015 **1ST PRIZE**, CHINA UNDERGRADUATE MATHEMATICAL CONTEST IN MODELING, AWARDED BY CSIAM

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