Bowen Fang

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EDUCATION

Columbia University in the City of New York New York, NY
Master of Science, Operations Research Expected Dec 2023
- GPA: 4.11/4.0
- Relevant courses: PhD-level: Advanced Big Data and AI(A+), ML and High-dimensional Analysis(A), Robot Learning(A)
- TA experience: master-level Optimization

Peking University Beijing, China
Bachelor, major in Big Data Management and Application, minor in Economics Sep 2018 - Jul 2022
- Relevant courses: Database System, Deep Learning, Data Structure and Algorithm

WORKING EXPERIENCE

Data Scientist, Part-time, **MathWorks** Aug 2022 - Dec 2022, NY, United States
- Developed novel RL algorithms to solve Goal-based Wealth Management which make better decisions in all scenarios and longer horizons. Blog.
- Proposed reward engineering methods to enable the agents to approximate to optimal behavior generated from dynamic programming on synthetic data with limited access to just 10% of all cases.
- Realized an increase from 41% to 61% average success rate compared to Q-Learning for portfolios with practical constraints and the result is supported by extensive experiments.

ML Researcher, Intern, **AI TOPIA** Sep 2021 - Jun 2022, Beijing, China
- Researched on order placement optimization so to better control execution cost for our trading strategies.
- Developed a new tick-level buy/sell matching program that incorporates Indexed Priority Queue to handle large raw data parallelly on cluster to provide the team data with higher quality and faster.
- Optimized tick-level order placement strategy with 2 researchers using DRL so it would place on average 2-ticks better price and remain similar inference time through distillation.

Software Engineering, Intern, **Nomura Securities Orient International** Jul 2021 - Sep 2021, Shanghai, China
- Perfected our website so customers can get a more thorough understanding of fund products compared to the old version. Built dashboard and SQL database for metrics include style and systematic risk.
- Realized a new feature in MongoDB and a web crawler so that data from target URLs are stored into SQL databases and updated in front-end visualizations on a daily basis.

PUBLICATIONS

(**Submitted to AAMAS**) **Bowen F.**, Xu C. and Sharon D. Learn to Tour: Operator Design for Feasible Solution Mapping. NY, United States

OPEN-SOURCE EXPERIENCE

Author of Python Open-source Library MCTS-based Reinforcement Learning Muax NY, United States
- Implemented easy-to-modify and light weight MuZero and its variants that can be seamlessly fitted into RL pipeline and provide APIs that are familiar to RL practitioners compared to other implementations.
- Created tutorials to guide users to Muax features such as using MuZero in simple loop, customizing loss function and end-to-end training so the users can get started immediately after pip installation.
- Achieved that Muax is now an example project listed in DeepMind's library mctx.

PROJECT EXPERIENCE

Autonomous Learning of Physical Environment through Neural Tree Search Jan 2023 – May 2023, NY, United States
- Proposed a MCTS-based reinforcement learning algorithm to perform active slam based on RGB and odometry sensor.
- Created novel loss function that combined MuZero loss with SLAM loss to enable end-to-end building map while planning.

Temporal Graph Attention Network Prediction on Ethereum Transaction Cost Aug 2022 - Dec 2022, NY, United States
- Proposed a GNN model based on temporal transaction network that outperforms time series models in months of testing.
- Enabled automatic train and tune with Airflow and deployed on GCP to provide real-time predictions with latest model.

Deep Learning and Application in Intraday Trading System, Mentor: Meng Fan Mar 2021 - Jul 2021, Beijing, China
- Implemented TimeGAN to generate synthetic data for futures, and compared synthetic data with real data to ensure sanity.
- Deployed system on cloud, which can receive real-time data from the Exchange and updated model with augmented data.

JPMorgan, Asset and Wealth Management Competition APAC Sep 2020 - Oct 2020, Beijing, China
- Designed quantitative proposal that balanced client's wealth appreciation and liquidity demand, and made it to the final round.
- Optimized asset allocation to realize low variance for target return and evaluated with metrics to ensure the efficiency.

SKILLS

- Technical: Airflow, AWS, Docker, GCP, Git, Java, MATLAB, MongoDB, Python, Spark, SQL
- Language: English, Mandarin