TIANKAI YAN

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EDUCATION

Stanford University **Sept 2023 - Ongoing**
M.S. in Computational and Mathematical Engineering (ICME)

Georgia Institute of Technology **Aug 2019 – Dec 2022**
- **B.S. in Mathematics with minor in Computational Data Analysis**
- **GPA: 3.97/4.0, Major GPA: 4.0/4.0. Faculty Honors of 7 times**

Related Fields
Probabilities and Bayesian Analysis, Applied Statistics, Machine Learning and Deep Learning, Partial Differential Equation

EMPLOYMENT EXPERIENCE

QRT: Internship in Quantitative Research **June 2024 - Sept 2024**
Qube Research & Technologies (QRT):
- Conducting quantitative research on SP1500 index rebalancing, analyzing correlated features and additions patterns, including liquidity, sectors shift, and relationship between additions and deletions, etc.
- Developing learning models for index additions using XGBoost and SVM, implementing methods to tackle label imbalance issues.
- Designing a trading strategy, combining statistical weighting techniques, long/short trading, and novel features, such as crowding factors. The current strategy achieves 13 % of return over a 7-month period, significantly outperforming the 4 % of baseline.

Barclays: Internship in Quantitative Analytics **June 2023 – Aug 2023**
Barclays
- Developed Deal Engine consisted of address "monikers", which is able to update the monikers point in time, deploy computation and analysis among monikers, and provide visualized result for clients.
- Quantitatively investigated contractual terms for a co-branded credit card deal, achieving a 15 percent performance improvement. Performed calculations across 10 years, 4 economic scenarios, within 12 seconds and visualized results with heat maps.

RESEARCH EXPERIENCE

Research in Multi-Modal Large Language Models of Medical Domain **Mar 2024 - July 2024**
Stanford University
- Worked in the Bioengineering Team at Stanford. Our group developed Multi-modal Medical Agent (MMedAgent), **the first** multimodal medical AI Agent, able to solve 7 medical tasks using various tools and provide comprehensive answers.
- The MMedAgent model displays superior results in diverse tasks and open-ended questions across modalities. It outperforms Llava-Med, the current most popular multimodal medical AI by Microsoft, with **overall 1.8 times higher** in evaluation score.
- Contributed to the project by building Grounding and Segmentation parts in various medical modalities, including CT, XRay, etc.
- Publication: **MMedAgent: Learning to Use Medical Tools with Multi-modal Agent** https://arxiv.org/pdf/2407.02483
  Published in **EMNLP**, top conference in NLP

Assignment Problem Research and Exploration of the Dynamic Modified Hungarian Algorithm **May 2022 - Aug 2022**
Georgia Tech
- Created optimization method of the Dynamic Modified Hungarian Algorithm, reaching complexity of $O(mn)$, better than conventional approaches Hungarian algorithm ($O(n^3)$) and modified Hungarian algorithm ($O(mn^2)$), in cases of changed edges
- Conducted optimization and graphic-interpretation research. Investigated broad applications of Dynamic Modified Hungarian Algorithm on assignment problems and optimal transport. Wrote a report reviewed and recommended by professors.

PROJECT EXPERIENCE

Neural Networks and Pairs Trading **Mar 2024 – May 2024**
Stanford
- Developed multiple RNN model variants to analyze paired securities and to predict price movements for the next month.
- Implemented a pairs trading strategy using co-integration methods; constructed portfolios,achieved a 20 % return in back-testing. Employed mean reversion techniques, statistical analysis, and stress test for enhanced accuracy

SKILLS

- **Programming**: Python (PyTorch, Statsmodels, Tensorflow, Scikit-learn, Pandas, Keras), JavaScript, SQL, R, Git
- **Sports**: Poker (Finalist in Stanford x Berkeley Poker Tournaments), Table Tennis, Fencing (Won fencing competition at GT)
- **Responsibility**: K-12 Mathematics Tutors(April – June 2023) at Mastery Learning Hour, Invasive Plants Removal
- **Leadership**: the Chief Editor of the Campus Magazine, the Leader of Project, Data-informed Video Game Assistant