Jiaxin Ye

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EDUCATION

University of California, San Diego — San Diego, CA
Bachelor of Science in Applied Math & Computer Science — March 2024
- *Curricular GPA:* 3.98/4.00 (Top 1.5%)
- *Honors:* Provost Honors, Thurgood Marshall College Honors Program
- *Applied Math Class Rank:* 1 / 191
- *Math Courses:* Calculus, Real Analysis, Statistics, Probability, Stochastic Process, Optimization, Linear Algebra, Time Series, Numerical Analysis, Computational Stochastics, (All A+'s for the above), Measure Theory
- *Computer Science/Data Science Courses:* Database, Operating Systems, Data Structures (A+), Software Engineering, Machine Learning, Algorithm, Recommender System, Web Mining, Graph Theory, AI: Search and Reasoning

University of Wisconsin, Madison — Madison, WI
Doctor of Philosophy in Statistics — Expected May 2029
- *Curricular GPA:* 3.85/4.00

HONORS & AWARDS

- 2023-2024 UC San Diego Physical Sciences Dean's Undergraduate Award for Excellence

PUBLICATION & PRESENTATIONS

- Fred Weiying Zhang, Jiaxin Ye, and Zhuoran Yang. In-Context Multi-Armed Bandits via Supervised Pretraining. *NeurIPS 2023 Workshop Foundation Models for Decision Making*, 2023.
- Jiaxin Ye, In-Context Multi-Armed Bandits via Reward-Weighted Sampling, ML Seminar, Department of Mathematics, University of California, San Diego, November 17, 2023.

RESEARCH EXPERIENCE

Decision Transformer & In-Context Learning — Remote, U.S.
Advised by Professor Zhuoran Yang — July 2023 – January 2024
- Investigating large transformer models' in-context learning capabilities, with a focus on decision-making within reinforcement learning (RL) environments, specifically multi-armed bandit problems.
- Developed the Reward Weighted Decision-Pretrained Transformer (DPT-RW), a model employing supervised pre-training with reward-weighted imitation learning loss using **PyTorch**
- DPT-RW excels in solving a wide range of RL problems in-context, demonstrating online exploration and offline conservatism, despite being trained on data generated from suboptimal policies
- Conducting experiments similar to MDP environment with discounted reward

Temporal Difference Learning — San Diego, CA
Advised by Professor Yuhua Zhu — April 2023 – January 2024
- Generalized temporal difference (TD) learning algorithm to continuous time and continuous space setting to extract the optimal control, thus maximizing the value for any state
- Implemented the continuous TD algorithm with **Python** for swinging up a pendulum with limited torque, achieving consistent convergence when the pendulum consistently reaches its apex, indicative of high value
- Derived a formula accommodating stochastic movement, enhancing the algorithm's robustness and real-world utility
- Currently exploring an alternative approach employing ODE (Galerkin method) rather than the traditional TD method and investigating the use of alternative basis functions to estimate value functions in a continuous setting

PROJECT EXPERIENCE

Fraudulent Transaction Detection Machine Learning Project — Jan 2023 – March 2023
- Developed a model for binary classification of transactions as either legitimate or fraudulent by analyzing 1.35 GB of imbalanced data from Kaggle and performing data cleaning through **Apache Spark** and **NumPy**
- Reduced the dimensionality of the data and prevented overfitting by employing **one-hot encoding** and **PCA** to 41326 rows of numerical and categorical data
- Completed detection by comparing the performance of various classification models through **K-Fold cross validation** and hyperparameter tuning using **grid search**; achieved 82% accuracy & 81% recall with the tuned **XGBoost** model

Stock Trade Project — May 2022
- Conducted a statistical analysis of the Stock Trades data (16.79 MB) to evaluate potential differences in transaction types (full sale VS partial sale) between Republicans and Democrats
- Replaced 6 rows of missing dates with actual dates as indicated by stock data links; merged the original dataset with affiliated party information to enable analysis based on political affiliation
- Ran the permutation test to determine whether the two parties exhibit different preferences in selling stocks using

TVD as the test statistic
- Results revealed that the distributions of partial and full sale of stocks are different across the two parties

TEACHING EXPERIENCE

UW Madison Department of Statistics   **Madison, WI**
Teaching Assistant   September 2024 – Present
- Teaching assistant for Data Science Modeling
- Hold weekly office hours and lead discussion sections, dedicating 10 hours per week to support students with assignments and address their questions promptly
- Participates in weekly staff meetings to contribute to lesson planning and provide updates on students' progress
- Assists instructors in the assessment process, including grading assignments and exams

UC San Diego Department of Mathematics & Department of Computer Science   **San Diego, CA**
Undergraduate Tutor & Grader   October 2021 – April 2024
- Tutor & grader for Differential Equations, Linear Algebra, Real Analysis, Numerical Analysis, Statistical Methods, Data Analysis and Inference, and Calculus
- Conducted weekly office hours and participates in discussion sections, dedicating 6 hours per week to assist students with assignments and address general inquiries; maintained a consistently high recommendation rate exceeding 90%
- Actively engaged in weekly staff meetings to contribute to planning and share insights on students' progress
- Collaborated with instructors in the evaluation process, providing support in grading homework and exams

Halicioğlu Data Science Institute (HDSI)   **San Diego, CA**
Undergraduate Tutor   March 2022 – December 2022
- Tutor for Principles of Data Science and Data Structures
- Hosted 4 hours of weekly office hours weekly, offering guidance to students on assignments, concepts, and related queries; maintained a commendable recommendation rate exceeding 93%
- Constructed and maintained the course homepage and GitHub repository; regularly updated it throughout the term
- Developed automated tests for programming assignments, facilitating streamlined assessment using Gradescope, an online grading platform
- Designed midterm and final questions that align with learning objectives and reflect materials comprehensively

WORK EXPERIENCE

UC San Diego School of Global Policy and Strategy   **Remote, U.S.**
Research Assistant at Power Transformation Lab   August 2023 – September 2023
- Constructed unit tests for extrapolation model verification through the creation of 2D plots, with height and wind speed as axes, and compared the generated plots with theoretical results, ensuring accuracy across multiple geographical locations
- Generalized the critical wind speed estimation model for a large-scale geospatial data Python platform, encompassing over 4000 lines of code to accommodate various datasets; optimized the code to handle edge cases
- Built upon the extrapolation model, created the interpolation model to estimate wind speeds within known heights; improved code efficiency by 40% through parallelization using the **JIT Numba** library

TRACT   **Remote, U.S.**
Software Engineer Intern   June 2023 – August 2023
- Implemented an automated streamlined process by integrating web scraping techniques using **WebDriver**, enabling efficient scanning for investors' profiles; increased query speed by 80%
- Developed an advanced chatbot by connecting to a **MongoDB** database for data retrieval about individual reports and leveraging **OpenAI API** to process user inputs and generate highly informative responses based on searches in the database; maintained conversation history for seamless chat interactions within **Flask**'s session

SKILLS

- ***Languages:*** Mandarin (Native), English (Full Professional), Cantonese (Elementary), Japanese (Elementary)
- ***Technical Skills:***
  - *Programming Languages:* Java, C++, C, HTML, CSS, JavaScript
  - *Data Analysis:* R, Matlab, SQL, Python (NumPy, Pandas, Sklearn, matplotlib, PyTorch)
  - *Other:* Regex, Git, NLP, version control