Manlin Zhang

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Education

University of California, San Diego *Sept 2024 - Jun 2026 (Expected)*

Master of Science in Data Science *GPA: 3.7/4.0*

- Courses: Machine Learning Algorithm, Network Data Science, Optimization, Interpretable Machine Learning, Explainability in Artificial Intelligence, Natural Language Processing

University of Wisconsin - Madison *Sept 2020 - May 2024*

Bachelor of Science in Mathematics *GPA: 3.7/4.0*

- Courses: Abstract Algebra, Real Analysis, Data Science, Statistics, Probability Theory, Algorithms, Calculus
- Dean's List for three consecutive semesters

Professional Experience

Data Analyst and Product Management Intern *Jun 2023 - Jul 2023*

JD.com Inc., Brand Business Department

- Conducted customer churn analysis on a dataset of over one million rows in RStudio, utilizing regression analysis, ANOVA, and T-tests to generate daily insights for optimizing sales policies
- Designed and implemented A/B tests for new mobile app features, analyzing data from 500 million customers; increased Unique Visitor (UV) sales by 23.5% and Gross Merchandise Volume (GMV) by 15%
- Developed a fraud detection model using Random Forest, achieving a Z-score of 1.98 (95% confidence level) to identify coupon abuse by vendors, increasing detection accuracy by 26% and reducing fraudulent coupon use by 43%

Publications

"This really let's us see the entire world:" Designing a conversational telepresence robot for homebound older adults *DIS 2024*

Yaxin Hu, Laura Stegner, Yasmine Kotturi, Manlin (Caroline) Zhang, Yi-Hao Peng, Faria Huq, Yuhang Zhao, Jeffrey P Bigham, Bilge Mutlu *July 2024*

Research Experience

People and Robots Laboratory, University of Wisconsin-Madison *Oct 2023 - May 2024*

Research Assistant; Advisor: Bilge Mutlu, Yaxin Hu, Arissa Sato *Madison, WI*

- Developed a telepresence robot using Raspberry Pi SDK, ROS, and Python to enable remote touring for homebound elderly individuals and people with disabilities
- Integrated large language models (GPT-3, GPT-4) via prompt engineering, enabling responsive, conversational interactions between the robot and users
- Analyzed interaction data and robotics logs using qualitative and quantitative methods, providing insights to human and computer interaction research

Madison Experimental Mathematics Lab *Sept 2023 - Dec 2023*

Undergraduate Researcher; Advisor: Tullia M. Dymarz, Becky Eastham *Madison, WI*

- Constructed a 3D mathematical model illustrating Diestel-Leader Graph in Python and MATLAB
- Compared and contrasted the pattern in DL graph with Voronoi diagrams to discover its application on K-NN clustering algorithm
- Participated in Open House and Academic Forums, explaining the research progress, outcomes, and limitations

Projects

Enhancing 3D Vegetation Models for Wildfire Prediction using Machine Learning *Feb 2025 - Now*

San Diego, CA

- Developed machine learning models to improve tree species classification and construct high-fidelity 3D vegetation models, enhancing wildfire prevention strategies.
- Processed and analyzed large-scale geospatial datasets and mapping to refine site-specific fire behavior predictions.
- Engineered predictive models using deep learning and ensemble methods, improving the accuracy of treelist generation for simulation models.

Comparative Analysis of Machine Learning Methods for Bird Call Recognition

Jan 2025 - Now

San Diego, CA

- Conducted research on deep learning graph based audio classification, developing and evaluating machine learning models (Random Forest, SVC, XGBoost, SVM) for bird call recognition
- Designed and implemented large-scale audio preprocessing pipelines, including noise reduction, spectrogram transformations, and Mel-Frequency Cepstral Coefficients (MFCCs) feature extraction, to improve model performance
- Explored cross-modal learning approaches by integrating audio feature engineering with deep learning architectures for enhanced species classification in complex acoustic environments

AI-Powered Network Database using LLMs for Movie Recommendation System

Jan 2025 - Now

San Diego, CA

- Construct LLMs to process and interpret structured and unstructured network logs, generating real-time summaries to assist in identifying unusual patterns and potential security threats
- Applied natural language processing (NLP) techniques to refine summaries with key metrics, such as traffic volume, packet loss, and error rates
- Integrated the LLM-based system into platforms, enabling automatic detection and classification of network events

Interpretable Decision Sets (IDS) for Enhancing Trust in AI Models

Oct 2024 - Dec 2024

San Diego, CA

- Conducted an analysis of Interpretable Decision Sets (IDS) to improve model transparency and user trust, focusing on balancing local fidelity with global trust
- Compared and contrasted IDS with traditional explainability methods like LIME and SHAP to assess their impact on model interpretability and user decision-making
- Developed a framework for integrating IDS into decision-making processes and interpretability evaluation

Customer Churn Prediction Model Using Machine Learning for Financial Services

Jun 2024 - Jul 2024

- Developed a customer segmentation model using K-Means clustering on transaction data to enhance targeted strategies
- Created an interactive Tableau dashboard with over 10 visualizations to monitor customer segments and generate actionable insights for strategic decision-making
- Launched targeted campaigns based on segmentation, using transfer learning on a large financial dataset, achieving a 15% increase in new customer conversions and 10% in revenue per user

Skills

Programming	Python (Pandas, NumPy, SciPy, Scikit-Learn, PyTorch, TensorFlow), R, SQL, Linux, MATLAB, LaTeX, Javascripts
Analytical Methods	ML Models(Random Forest, Bayesian Optimization), Optimization, Deep Learning, Data Visualization, Data Cleaning
Tools	Tableau, Power BI, Git, Azure, GCP, AWS, Word, Excel, PowerPoint
Language	Mandarin (native), English (proficient), Japanese (intermediate)