Xingjian Ma

xingjian.ma@uconn.edu
860-634-1048

Education

University of Connecticut **Sep 2024 – Present**
PhD Student in Statistics, Department of Statistics *Storrs, CT, U.S.*

- *Courses: Design of Experiments, Statistical Inference, Linear Models*

Renmin University of China **Sep 2022 – Jun 2024**
Master of Science in Applied Statistics, Institute of Statistics and Big Data *Beijing, China*

- *Courses: Clinical Trial Statistical Methodology, Causal Inference, Survival Analysis*

Xi'an Jiaotong University **Sep 2018 – Jun 2022**
Bachelor of Economics in Finance, School of Economics and Finance *Xi'an, China*

- *Courses: Probability Theory, Mathematical Statistics, Econometrics*

Research Experience

Center for Population Health, UConn Health **Jan 2025 – Jun 2025**
Research Assistant, Advised by Dr. Shane Sacco *Farmington, CT, U.S.*

- Conducted data mining and visualization on patient demographics data and clinical records to identify factors associated with suicide rates, and applied simple statistical tests (e.g., Wilcoxon test) to detect significant group differences.
- Implemented survival analysis using Weibull Cox and Logistic regression models to identify key variables affecting suicide risk and estimate survival curves for time-to-event outcomes.
- Employed multiple machine learning techniques, including Random Forest, SVM, and Neural Networks, to predict suicide rates and improve forecasting accuracy based on the identified risk factors.

Connecticut Children's Medical Center **Aug 2024 – Jun 2025**
Research Assistant, Advised by Prof. Jun Yan *Hartford, CT, U.S.*

- Preprocessed and visualized emergency department census data from Connecticut Children's Medical Center, using heatmap calendar plots to reveal key periodic patterns and temporal trends in patient flow.
- Collected external covariates (temperature, air pollution, water quality) from public APIs, integrated them with census data, and performed data merging for downstream modeling and analysis.
- Utilized Fourier series to construct a harmonic dynamic regression model to estimate different periodic cycles, combined with an ARIMAX framework to model non-periodic short-term variations, achieving effective forecasting performance.

Institute of Geriatric Medicine, Beijing Hospital **Oct 2022 – May 2023**
Research Assistant, Advised by Prof. Guangyu Yang *Beijing, China*

- Streamlined and preprocessed population data from Beijing Hospital, and utilized line plots and cubic spline regression plots to identify significant change points in various physiological function variables.
- Estimated knots in linear spline models using the Newton-Raphson algorithm, specifically tailored to capture critical shifts related to the aging process.
- Developed advanced plotting functions to visually validate results and engaged in thorough consultations with hospital doctors, ensuring a robust integration of statistical findings with clinical experiences.

Teaching Experience

Renmin University of China, Institute of Statistics and Big Data **Sep 2023 – Jan 2024**
Teaching Assistant for Course Clinical Trial Methodology *Beijing, China*

Publications

- Xingjian Ma, Robert H. Aseltine, Tze Chiam, Richelle deMay, Yingfa Xie, and Jun Yan. Forecasting Emergency Department Census: Leveraging Periodic Patterns and External Covariates. (*In preparation*)
- Xingjian Ma and Yang Liu. Balancing Observed and Unobserved Covariates with Multi-arm Covariate-Adaptive Randomization for Unequal Allocations. (*In preparation*)

Projects

Parkinson's Disease Progression Prediction | *Python* **May 2023 – Jun 2023**

- Engineered time-aware clinical features from high-dimensional proteomic data, reducing 1,200+ variables to 25 informative predictors, enhancing model interpretability and performance.
- Developed a hybrid model combining LightGBM (multi-class classification) and a neural network and applied strict time-series cross-validation to ensure robust generalization on future patient visits.

Covariate-Adaptive Randomization in Group Sequential Design | *R, Rcpp* **Feb 2023 – Dec 2023**

- Proposed a general procedure of multiarm covariate-adaptive randomization (CAR) with unequal allocation ratio. Provided theoretical properties (variance and asymptotic normality) of observed and unobserved covariates imbalance.
- Incorporated covariates in a multivariate regression analysis to aid in estimating the variance of treatment effects, further optimizing the efficiency of interim analysis and reducing the expected sample size.
- Conducted numerical simulation experiments to compare the test efficiency of clinical trials under different α spending functions and covariate regression methods to obtain the optimal design plan.

Deep Reinforcement Learning | *Python (PyTorch)* **Oct 2022 – Dec 2022**

- Developed AI-driven algorithms employing CNN architectures (e.g., AlexNet, VggNet, ResNet) for enhanced interactive game image analysis, incorporating data augmentation and transfer learning techniques to boost model robustness.
- Utilized reinforcement learning strategies, specifically the Q-learning algorithm, to continuously train and refine the model based on dynamic game scenarios, resulting in improved decision-making and adaptability.

Honors & Awards

- Outstanding Graduate of Renmin University of China **Apr 2024**
- Graduate Excellent First Class Scholarship, Renmin University of China **Oct 2023**
- Honorary Title of Outstanding Student Cadre, Renmin University of China **Oct 2023**

Technical Skills

Programming: R (dplyr, tidyverse, ggplot2); Python (Numpy, Pandas, PyTorch); Rcpp; SAS; Git; Linux

Languages: Chinese(Native); English(Fluent - TOEFL: 100 (R28 L26 S22 W24))