Yuyao Wang

PhD student
Department of Mathematic
University of California San Diego
La Jolla, CA 92093 U.S.A.

email: yuw079@ucsd.edu

Education

2019 - now *PhD*, Mathematics, University of California San Diego
2015 - 2019 *BS*, Mathematics, Xi'an Jiaotong University

Fellowships

2019 - 2023 Halicioglu Data Science Institute Graduate Prize Fellowship

Research Interests

Causal inference, survival analysis, semiparametric theory.

Publications and Preprints

2022 **Wang, Y.**, Ying, A., Xu, R. (2022) Doubly robust estimation under covariate-induced dependent left truncation. *arXiv preprint arXiv:2208.06836* (This paper won the award of the student paper competition in 2023 Lifetime Data Science Conference)

2023 Peng, Y., **Wang, Y.**, Xu, R. (2023). Measures of explained variation under the mixture cure model for survival data. *Statistics in Medicine*, 42(3), 228-245.

Presentations

2023 Doubly Robust Estimation under Covariate-induced Dependent Left Truncation. *Presentation at 2023 Lifetime Data Science Conference.*

2023 Multiply Robust Estimation of Treatment Effect for Time-to-event Outcome under Dependent Left Truncation. *Poster at 2023 American Causal Inference Conference.*

2023 Doubly Robust Estimation under Covariate-induced Dependent Left Truncation. *Poster at*

2023 Public Health Research Day at UCSD.

2022 Semiparametric Estimation for Non-randomly Truncated Data. *Poster at 2022 American Causal Inference Conference.*

2022 Semiparametric Estimation for Non-randomly Truncated Data. *Poster at 2022 Public Health Research Day at UCSD.*

Research Experience

2021 - now **Doubly robust Estimation under Covariates-induced Dependent Left Truncation**, UC San Diego

PhD Student (Supervisor: Ronghui Xu)

- Derived the efficient influence curve (EIC) for the expectation of an arbitrarily transformed survival time.
- Constructed EIC-based estimators that are shown to have favorable properties, including model double robustness, rate double robustness, and semiparametric efficiency.
- Provided technical conditions for the asymptotic properties that appear to not have been carefully examined in the literature for time-to-event data.
- Our work represents the first attempt to construct doubly robust estimators in the presence of left truncation.
- Applied our estimator to analyze a data set form a study on central nervous system (CNS) lymphoma and a data set from the Hanolulu Asia Aging study.
- Extended the doubly robust estimating function to estimate parameters in other settings, including estimating causal effects and estimating hazard ratio under a marginal Cox model.

2020 - 2022 **Measures of Explained Variation under the Mixture Cure Model**, UC San Diego

PhD Student (Supervisor: Ronghui Xu)

- Proposed two approaches to define explained variation under the mixture cure models. One based on the Kullback-Leibler information gain and the other based on residual sum of squares.
- Studied the property of the measures of explained variation both analytically and by simulation studies; applied the measures to the bone marrow transplant dataset and the SEER-medicare dataset.

2018 - 2019 **Posterior Consistency for Bayesian Method of Inverse Problems with Non-Gaussian Noise Assumption**, Xi'an Jiaotong University

Research assistant (Supervisor: Jianxiong Jia)

- Studied the methods and algorithms of Bayesian approach to inverse problems.
- Generalized the consistency result in *Posterior consistency for Bayesian inverse problems through stability and regression results* by Sebastian J Vollmer to Bayesian inverse problem with Gaussian mixture noise.

2018 **Active Subspace and Sliced Inverse Regression** Georgia Institute of Technology

Research assistant (Supervisor: Wenjing Liao)

- Proved two theorems for the error bounds of the estimated covariance matrix and the estimated projection matrix for the specific problem we studied when using active subspaces.
- Compared the performance of active subspace method with sliced inverse regression in simulation and analyzed convergence rates and find the optimal tuning parameter for active subspace method.

2017 - 2018 **Transfer Learning and Domain Adaptation** , Xi'an Jiaotong University
Research assistant (Supervisor: Limin Li)
- Reviewed the literature of transfer learning and domain adaptation.
- Implemented CNN, DAN and JAN and assessed these methods using Office-31 and Caltech-10 datasets.

Teaching Experience

UC San Diego

2023 High School Math Program (Probability and Statistics, advanced track), mentor, Summer 2023.
MATH 284: Lifetime Data Analysis, TA, Spring 2023
MATH 181B: Introduction to Mathematical Statistics, TA, Spring 2023
DSC 180B: Data Science Project II, TA, Winter 2023
2022 DSC 180A: Data Science Project I, TA, Fall 2022
MATH 181A: Introduction to Mathematical Statistics I, TA, Winter and Spring 2022
2021 MATH 10A: Calculus I, TA, Fall 2021
MATH 185: Introduction to Computational Statistics, TA, Spring 2021
MATH 189: Data Analysis and Inference, TA, Winter 2021
2020 MATH 11: Calculus-Based Probability and Statistics, TA, Fall 2020
MATH 189: Data Analysis and Inference, TA, Winter and Spring 2020
2019 MATH 10B: Calculus II, TA, Fall 2019

Outreach

2023 Presentation at the UCSD Halicioglu Data Science Institute research review event for industry partners
2023 Poster presentation at the UCSD Halicioglu Data Science Institute Open House for prospective PhD students
2022 Moderator for the Prospective International Graduate Student Panel in math department at UC San Diego
2022 Mentor in AWM undergrad mentorship program at UC San Diego
2020 - 2021 Mentor in math graduate mentorship program at UC San Diego

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