SIJIA LIAO

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EDUCATION

Doctorate Degree, University of Arizona — Aug. 2020 - May 2026 (Expected)
Statistics and Data Science, GPA: 4.0/4.0 — *Tucson, Arizona, USA*

Master of Science, Sun Yat-Sen University — Aug. 2017 - Jul. 2020
Probability and Mathematical Statistics, GPA: 4.0/4.0 — *Guangzhou, Guangdong, China*

Bachelor of Science, Sun Yat-Sen University — Aug. 2013 - Jul. 2017
Mathematics and Applied Mathematics, GPA: 3.6/4.0 — *Guangzhou, Guangdong, China*

EXPERIENCE

Research Scientist Intern — Jun. 2025 - Dec. 2025
TikTok Inc. — *Bellevue, Washington, USA*

- Developed and productionized an indicator- and rationale-augmented training framework for a Vision-Language Model to detect TikTok content violations, improving decision consistency/interpretability via rationale-based reasoning and delivering measurable F1 lift (+2-5%).
- Designed a dynamic EMA checkpoint ensembling algorithm to improve robustness across training snapshots; validated offline and adopted in the training pipeline, yielding +2–4% F1 and more stable performance on challenging slices.
- Performed hard-case mining and error analysis on model outputs to identify failure modes and drive model improvements.

Graduate Research Assistant/Associate — Jan. 2023 - May 2025
Mel and Enid Zuckerman College of Public Health, University of Arizona — *Tucson, Arizona, USA*

- Developed a **nonparametric** methodology for **high-dimensional data** analysis that integrates **variable selection and smoothing**, with rigorous support from theoretical analysis and simulation results.
- Developed an interpretable method for **scalar-on-image regression** models that captures spatially heterogeneous relationships (sparse and smooth) between the spatial predictors and scalar response.
- Designed an algorithm that achieves a 10% reduction on average in prediction error over P-splines and FPCR methods, while enhancing the identification rate of non-predictive regions by **90%**.

Graduate Teaching Assistant — Aug. 2021 - Dec. 2024
Department of Mathematics, University of Arizona — *Tucson, Arizona, USA*

- Aug. 2024 - Dec. 2024, Math/Stat 564 - Theory of Probability.
- Aug. 2022 - Dec. 2022, Math/Stat 263 - Introduction to Statistics and Biostatistics.
- Aug. 2021 - Dec. 2021, Jan. 2022 - May 2022, Math 112 - College Algebra Concepts and Applications.

PAPER

Interpretable Scalar-on-Image Linear Regression Models via the Generalized Dantzig Selector, Sijia Liao, Xiaoxiao Sun, Ning Hao, Hao Helen Zhang. Submitted, under review.[arXiv].

High-Dimensional Analysis of COSSO in Additive Models, Sijia Liao, Hao Helen Zhang. Working paper.

HONOR AND AWARDS

Finalist, 2025 ASA Nonparametric Statistics Section Student Paper Awards
"Interpretable Scalar-on-Image Linear Regression Models via the Generalized Dantzig Selector." Invited to present at the Joint Statistical Meetings (JSM) 2025, Nashville, Tennessee.

Honorable Mention, Outstanding Graduate Teaching Assistant (GTA) Awards
In recognition of the role as TA for the graduate level course Theory of Probability in Fall 2024.

TECHNICAL SKILLS

Languages/Software: R, Python, SAS, SQL, MATLAB, C/C++, AMPL
Libraries/Tools: xgboost, PyTorch, TensorFlow, scikit-learn, SciPy, NumPy; Gurobi, CPLEX, Git
Courses: Machine Learning Methodology, Regression Analysis, Design of Experiments, High Dimensional Statistics, Statistical Consulting, Statistical Computing, Bioinformatics and Functional Genomic Analysis, Large Scale Optimization, Applied Stochastic Process, Neural Network and Deep Learning