Wenrui Zhao

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Education

Ph.D. in Epidemiology (EPID Track) — Sep 2024 – Present
University of North Texas Health Science Center (UNTHSC) — *Fort Worth, TX, USA*

M.S. in Biostatistics — Sep 2022 – Sep 2023
University of Michigan — *Ann Arbor, MI, USA*

B.S. in Mathematics & Actuarial Science — Sep 2017 – May 2021
The Ohio State University — *Columbus, OH, USA*

Research Interests

Developing and evaluating multi-ancestry polygenic risk score (PRS) methods to improve genetic risk prediction and equity, with a primary focus on Alzheimer's disease and neurodegenerative disorders. Exploring the interface between statistical genetics and public health, including translation of risk models into clinically meaningful tools and evaluation of their ethical and epidemiological implications.

Publications

Peer-Reviewed Publications

1. **Zhao, W.** (2024). Study of CITE-seq protein expression prediction method based on LSTM. *The 3rd International Conference on Biotechnology, Life Science and Medical Engineering (BLSME 2024).*
2. **Zhao, W.** (2022). Predicting the malignant breast cancer using tumor tissue features. *The 11th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2022).*
3. Xie, S., Yu, Z., **Zhao, W.**, & Lu, X. (2021). Recombinant expression of rabies single chain antibody fusing shuttle peptide in *E. coli* and neutralization activity analysis. *Chinese Journal of Experimental and Clinical Virology*, 35(2).
4. Fan, M., Yuan, W., **Zhao, W.**, Xu, M., Wang, S., Gao, X., & Li, L. (2020). Joint prediction of breast cancer histological grade and Ki-67 expression level based on DCE-MRI and DWI radiomics. *IEEE Journal of Biomedical and Health Informatics*, 24(6), 1632–1642.

Manuscripts in Preparation

1. **Zhao, W.**, Andrews, S., Xing, C., Okorie, M., O'Bryant, S., Phillips, N., Barber, R., Khandakar, I., & Zhou, Z. A comparative evaluation of multi-ancestry polygenic risk score methods in Alzheimer's disease research.
2. Khandakar, I., Meeker, K., Petersen, M., Johnson, L., O'Bryant, S., Phillips, N., Barber, R., Zhang, K., **Zhao, W.**, Mendoza, E., & Zhou, Z. Predicting cognitive decline in cognitively unimpaired adults using a tiered machine learning framework.

Conference Presentations

1. **Zhao, W.**, Andrews, S., Xing, C., Okorie, M., O'Bryant, S., Phillips, N., Barber, R., Khandakar, I., & Zhou, Z. (2026, November). *A comparative evaluation of multi-ancestry polygenic risk score methods in Alzheimer's disease research.* Lightning presentation, Session 3068.0: Biological Determinants of Alzheimer's Disease and Related Dementias and Cognition Function (Aging & Public Health Program). American Public Health Association (APHA) 2026 Annual Meeting and Expo, San Antonio, TX.

Teaching Experience

Graduate Teaching Assistant, BIOS 5300: Principles of Biostatistics Fall 2026
University of North Texas Health Science Center, School of Public Health *Fort Worth, TX, USA*

- Support instruction in a graduate-level introductory biostatistics course through grading, written feedback, and office hours.
- Assist students with statistical concepts, software-based assignments, and data analysis projects.
- Help the course instructor with course preparation, organization, and student engagement.

Research Experience

Bioinformatics Researcher Jun 2023 – Nov 2023
LSTM-based CITE-seq Protein Expression Prediction *Columbus, OH, USA*

- Developed and optimized an LSTM model to predict protein expression from CITE-seq data; reported accuracy $\sim$95%.
- Handled large-scale biomedical data with batch effects and sparsity; processed mRNA/antibody sequences using Python toolchains.
- Authored a paper on applying LSTM for protein expression prediction from CITE-seq data.

Machine Learning Researcher Jul 2021 – Mar 2022
Tumor Tissue Feature Analysis *Columbus, OH, USA*

- Built logistic regression and random forest models for breast cancer diagnosis with EDA, feature selection, and ROC evaluation (R).
- Utilized the Wisconsin Breast Cancer dataset; performed preprocessing and robust model validation distinguishing benign vs. malignant tissue.
- Wrote the paper "Predicting the Malignant Breast Cancer Using Tumor Tissue Features" summarizing analysis and ML insights.

Researcher & Co-author Sep 2018 – Nov 2019
Breast Cancer Prognosis Prediction *Columbus, OH, USA*

- Contributed to a multitask learning framework for joint prediction of Ki-67 and tumor grade in breast cancer.
- Assisted radiomics feature extraction from DCE-MRI/DWI; supported analysis and interpretation for publication.

Technical Skills

Statistical & Programming: R, Python, SQL, STATA, SPSS, MATLAB, Java, C, C++
Tools & Environments: Linux, GitHub, Google Colab, Eclipse