Wenbo Zhang

PhD Student of Statistics

Department of Statistics
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Education

2021–present **PhD of Statistics**, *University of California, Irvine*.

2019–2021 **Master of Science, Biostatistics**, *University of Washington*.

2015–2019 **Bachelor of Science, Applied Mathematics**, *Xi'an Jiaotong-Liverpool University*.

Publications & Preprints

Under Review & Preprints

Wenbo Zhang, Yunhao Gou, Yuepeng Jiang, and Yu Zhang. Advae-flow: Adversarial vae with normalizing flows for multi-dimensional classification. *(Prepare to submit)*.

Eardi Lila, **Wenbo Zhang**, and Swati Rane. Interpretable discriminant analysis for functional data supported on random non-linear domains. *(Preprint in **arxiv**)*.

Lars Van Der Laan, **Wenbo Zhang**, and Peter Gilbert. Efficient nonparametric estimation of the covariate-adjusted threshold-response function, a support-restricted stochastic intervention. *(under review in **Biometrics**)*.

Youyi Fong, Ying Huang, Bhavesh Borate, Lars Wim, Paul van der Laan, **Wenbo Zhang**, Lindsay N. Carpp, Iksung Cho, Greg Glenn, Louis Fries, Raphael Gottardo, and Peter B. Gilbert. Antibody correlates of severe rsv disease in a vaccine efficacy trial. *(under review in **PNAS**)*.

Conference Papers

2021 **Wenbo, Zhang**, Kwun Chuen Gary Chan, Dean Shibata, and David Haynor. Finding atrophy patterns of grey matter through orthonormal non-negative factorization. In *Medical Imaging 2021: Image Processing*. SPIE, 2021.

2018 **Wenbo Zhang**, Sifan Song, Tianming Bai, Yanxin Zhao, Fei Ma, Jionglong Su, and Limin Yu. Chromosome classification with convolutional neural network based deep learning. In *2018 11th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics (CISP-BMEI)*, pages 1–5. IEEE, 2018.

Journal Articles

2021 Sifan Song, Tianming Bai, Yanxin Zhao, **Wenbo Zhang**, Chunxiao Yang, Jia Meng, Fei Ma, and Jionglong Su. A new convolutional neural network architecture for automatic segmentation of overlapping human chromosomes. *Neural Processing Letters*, pages 1–17. Springer, 2021.

2021 McDermott A Fong Y Benkeser D Deng W et al. on behalf of the Immune Assays Team; the Moderna Inc. Team; the Coronavirus Vaccine Prevention Network (CoVPN)/Coronavirus Efficacy (COVE) Team; Gilbert PB, Montefiori DC and the United States Government (USG)/CoVPN Biostatistics Team. Immune correlates analysis of the mrna-1273 covid-19 vaccine efficacy clinical trial. *Science*, page eab3435. American Association for the Advancement of Science, 2021.

Research & Work Experience

Apr,2021 – Aug,2021 ***Multi-dimensional Classification with Generative based Methods***.

- Conducted literature reviews about deep generative models and multi-task learning
- Utilized **PyTorch** to develop a novel framework for multi-dimensional classification based on VAE and normalizing flows, which creates a flexible shared latent space for features and labels

Role & Place — Research Assistant, *Department of Computer Science and Engineering at Southern University of Science and Technology*

Sep,2020 – Mar,2021 — ***Functional Data Analysis for Neuroimaging Diagnosis***.
- Developed a functional penalized regression method over two-dimensional manifolds with a smooth surface penalty; proposed an iterative optimization algorithm to solve this problem
- Coded scripts of the approach and data pre-processing using **Python and R**

Role & Place — Research Assistant, *Department of Biostatistics at University of Washington*

June,2020 – Sep,2020 — ***Correlation Study of Antibody Markers with Causal Inference***.
- Implemented an ensemble machine learning model to calculate the vaccine surrogate by using **R**
- Sped up the modeling computation with the parallel computing on the **Linux** cluster
- Helped to develop a non-parametric model based on Causal Inference techniques to estimate immune response threshold of risk

Role & Place — Research Assistant, *Fred Hutchinson Cancer Research Center*

Oct,2019 – June,2020 — ***Finding Atrophy Patterns of Grey Matter through Non-negative Matrix Factorization***.
- Proposed an orthogonal non-negative matrix factorization based approach in **Matlab and R** to obtain biologically meaningful components of the brains
- Extended this framework for longitudinal measurements; helped radiologists compare the disease group and the control group by their long-term patterns

Role & Place — Research Assistant, *Department of Biostatistics at University of Washington*

Apr,2018 – Sep,2018 — ***Chromosome Classification and segmentation with Deep Learning based approaches***.
- Utilized **Python (Keras)** to develop a deep convolutional encoder-decoder architecture based on U-Net to segment overlapped chromosomes
- Proposed a CNN model to classify each pair of chromosomes and automatically generated images

Role & Place — Research Assistant, *Department of Applied Mathematics at XJTLU*

Fellowships & Awards

2021 — ***School of Public Health's Outstanding MS Student Award***, awarded to one master student in Department of Biostatistics every year, University of Washington.

2020 — ***UW Summer Institutes Scholarship***, University of Washington.

2018 — ***University Academic Achievement Award***, awarded to 10% of all undergraduates, XJTLU.

Skills

Programming Languages — Python (PyTorch), R, SQL, Linux, Matlab, Java