ZEYU (JERRY) WEI

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EDUCATION

University of Washington - Seattle   09/2019-Present
  Ph.D., Statistics
  Advisor: Yen-Chi Chen, Tyler H. McCormick

University of Wisconsin – Madison   09/2015-05/2019
  Major in Statistics (Honor), Math (Honor), Sociology (Concentration in Analysis and Research)
  Certificate in Computer Science

RESEARCH INTERESTS

Graph-Assisted Machine Learning, Geometric Data Analysis, Network Analysis, Nonparametric Statistics

TECHNICAL SKILLS

Python, SQL, R, Spark, Scala, AWS, Java, C++, MATLAB, Mathematica, Altair, Vega-Lite, Excel

PROFESSIONAL EXPERIENCE

Data Scientist Intern   06/2023-09/2023
Machine Learning and Optimization Team, Amazon DSP, *Amazon Ads*

- Design time and resource-efficient online experiment framework for Real Time Bidding algorithms under real data constraints
- Create a realistic bidding simulator based on real data logs (10M+ a day) for effective offline testing.
- Model and validate the contention effects between adlines for better performance measures and more informed business decisions.

RESEARCH EXPERIENCE

Graph-Assisted Machine Learning Methods with Applications in Biology and Epidemic Modeling

Graph Learning for Single-Cell RNA with Velocity   03/2023-Present
  Advisor: Yen-Chi Chen (UW Stats), Kevin Lin (UW Biostat)

- Train graphical representations on high-dimensional scRNA-seq data (~20,000 genes) with inferred RNA velocity vectors.
- Quantify the uncertainties on the learnt representation with proposed statistical measures.

Skeleton Regression: A Graph-Based Approach to Estimation on Manifold   08/2021-Present
  Advisor: Yen-Chi Chen

- Invent a novel regression framework to deal with noisy multivariate data lying around low-dimensional manifold structures.
- Extend nonparametric regression methods to inputs on graphs.
- Develop Python [link] and R package [link] with applications to image data.

Skeleton Clustering: Dimension-Free Density-Aided Clustering   12/2019-07/2022

- Propose a clustering framework on large-scale high-dimensional data with density-aided similarity measures that circumvent the curse of dimensionality.
- Learn data representation incorporating geometric information using graphs.
- Implement the R package [link] and create interactive visualizations [link] on astronomy data.
- Published in the *Journal of the American Statistical Association* (Top Statistics journal)

Non-Robustness of Estimates on Networks with Measurement Errors 09/2021-Present
  Advisors: Tyler McCormick (UW Stats & Sociology), Arun Chandrasekhar (Stanford Econ), Paul
  Goldsmith-Pinkham (Yale Management)

- Identify failure conditions for epidemic models on contact networks due to missingness and state the corresponding policy implications.
- Validate the analysis by simulating epidemic diffusion on networks including real data.

On the Translates of General Dyadic Systems on R 05/2018-07/2018
  Advisors: Theresa C. Anderson (UW-Madison & Purdue Math)

- Generalize the mathematical notion of distinct dyadic system and prove classification criteria.

Financial and Healthcare Projects

The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People
  PI: Ward R Drennan (UW Otolaryngology) 01/2020- 08/2020

- Apply Mixed Effects Models to identify indicators of subclinical hearing problems with experimental Audiology data.

Model Maxima Series with Autoregressive Conditional Fréchet Model 07/2018-05/2019
  Advisor: Zhengjun Zhang (UW-Madison Stats)

- Model maximum stock prices by incorporating dynamic components into a generalized extreme value model with applications to stock returns and foreign exchange trading.

PUBLICATIONS

Journal Publications

[1] **Wei, Z.**, Chen, Y. (2023*)* Skeleton Clustering: Dimension-Free Density-Aided Clustering, *Journal of the American Statistical Association* (Top Statistics journal)

[2] **Wei, Z.**, Chen, Y. Skeleton Regression: A Graph-Based Approach to Estimation on Manifold (manuscript submitted to Journal of Machine Learning Research, top ML journal)

[3] Anderson, T.C., Hu, B., Jiang, L., Olson, C., **Wei, Z.** On the translates of general dyadic systems on R. *Mathematische Annalen*. 377, 911–933 (2020). (Top Math journal)

Conferences

[4] **Wei, Z.**, Chen, Y. Skeleton Regression: A Graph-Based Approach to Estimation with Manifold Structure, *Joint Statistical Meeting 2023*

[5] **Wei, Z.**, Chen, Y. Skeleton Clustering: Graph-Based Approach for Dimension-Free Density-Aided Clustering, *NeurIPS 2022 Workshop, New Frontiers in Graph Learning*

[6] **Wei, Z.**, Chen, Y. Noval Graph-Assisted Approach to Estimation on Manifold, *Symposium on Data Science & Statistics, 2022*

[7] Drennan, W., Langley, L., **Wei, Z.** The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People, *182nd Meeting of the Acoustical Society of America, 2022*

HONORS & AWARDS

- Student & Early Career Travel Award by American Statistical Association 2022
- Graduate Student Conference Presentation Award by UW Graduate School 2022
- R. Creighton Buck Scholarship 2019
- Phi Beta Kappa honors society member 2018

SERVICES & VOLUNTEERS

-Organizer of the Geometric Data Analysis Reading Group, UW Statistics 10/2021-Present
-Lead Tutor, coordinating tutoring center in UW Statistics department 09/2021-06/2023