# ZEYU (JERRY) WEI

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## RESEARCH INTERESTS

- Statistics: topological data analysis, nonparametric statistics
- Machine Learning: cluster analysis, manifold learning

## EDUCATION

**University of Washington, Seattle** 09/2019 – Present
**Ph.D. Student**
Advisor: Yen-Chi Chen

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

## RELEVANT COURSEWORK

Advanced Theory of Statistical Inference, Advanced Probability, Stochastic Modeling, Advanced Regression Methods, Statistical Learning Theory, Manifold Geometry
- Preliminary Exam: Sparse Subspace Clustering 06/2020
- Statistical Consulting: Project on mixed effect model 12/2020

## HONORS AND AWARDS

**R. Creighton Buck Scholarship** 2019
Awarded to graduating math major who has completed the best capstone experience as determined by the awards committee in Department of Mathematics, University of Wisconsin-Madison

**Phi Beta Kappa Honors Society Member** 2018
inducted as Junior, 5%

**3rd place in Midwest Undergraduate Data Analysis Competition** 2017

## RESEARCH EXPERIENCE

**Department of Statistics University of Washington, Seattle** 09/2019-present
Ph.D. student, Advisor: Yen-Chi Chen
- Working on a clustering framework that can deal with large-scale high-dimensional data with fast computation
- Recovers meaningful low-dimensional representation for high-dimensional data
- Proposed new density-based similarity measure that avoids curse of dimensionality
- Preliminary R package at https://github.com/JerryBubble/skeletonClus

**Undergrad Honor Thesis in Statistics** 07/2018-05/2019
Advisor: Zhengjun Zhang
- Modeling maxima series with Autoregressive Conditional Fréchet (AcF) Model, which incorporates dynamic components into generalized extreme value model
- Conduct data experiments on S&P 500 constituents with AR(1) and GARCH(1,1) filters

**Fields Undergraduate Summer Research Program** 07/2018-08/2018
Advisor: Mark Chignell
- Used cluster-boosted regression to improve predictions and deidentify confidential data
- Carried out Monte Carlo Simulation experiments to determine distributional properties that influence the boosting effect in cluster-boosted regression
- Drafted scientific report *Effectiveness of Cluster-Boosted Regression*

**UW Madison Summer School in Harmonic Analysis** 05/2018-07/2018
Advisor: Tess Anderson
- Paper published on *Mathematische Annalen*
- Generalized the notion of distinct dyadic system Provided classification criteria for distinct grids

**Wisconsin Policy Analysis Lab** 01/2018-05/2018
Advisor: Jason Fletcher
- Wrote report *Change in Distance to Nearest Abortion Facility in Wisconsin Change in Distance to Nearest Abortion Facility in Wisconsin, 2010 to 2017*

**National Council on Crime & Delinquency** 2017.05-2017.08
Data Analyst Intern
- Managed oracle database and generated data analytics reports to help coordinate agencies working for child welfare and juvenile justice cases
- Worked on modularizing reports for system conversion

**Data Analyst at BerbeeWalsh Department of Emergency Medicine** 2017.02-2017.10
PI: Shah, Manish N.
- Performed database management for the study on *Paramedic Coached ED Care Transitions to Help Older Adults Maintain Their Health*

**Applied Demography Research** 2017.01-2017.05
Advisor: Katherine Curtis
- Conducted final project with the Applied Population Laboratory and wrote a report on *Health Insurance Coverage in Wisconsin*, analyzed at county level

## TEACHING EXPERIENCE

**University of Washington, Seattle** 09/2019-present
**Teaching Assistant**, Department of Statistics
-STAT 390: Statistical Methods in Engineering and Science (with Caren Marzban, Fall 2020)
-STAT 221: Statistical Concepts and Methods for the Social Science (with William Brown, Summer 2020)

-STAT 220: Statistical Reasoning (with William Brown, Winter 2020)
-STAT 311: Elements of Statistical Methods (with Ranjini Grove, Fall 2019; with Tamre Cardoso, Spring 2020)

## PUBLICATIONS

***Publications***
Anderson, T.C., Hu, B., Jiang, L., Olson, C., Wei, Z. *On the translates of general dyadic systems on R.* Math. Ann. 377, 911–933 (2020). https://doi.org/10.1007/s00208-019-01951-z

***Technical Reports***
Fletcher, J., Madden, J., Romell, E., & Wei, Z. (2018*). Change in Distance to Nearest Abortion Facility in Wisconsin Change in Distance to Nearest Abortion Facility in Wisconsin, 2010 to 2017.* http://www.lafollette.wisc.edu/research-public-service/publications

***Preprint***
Wei, Z., Chen, Y. *The Skeleton Clustering: Methods, Theory, and Application*. Preliminary R package at https://github.com/JerryBubble/skeletonClus

## PRESENTATIONS

-*Graph Laplacian and Linear Smoother*, UW Geometric Data Analysis Group, Feb 2020

-*Autoregressive Conditional Fréchet (AcF) Model*, Undergraduate Symposium at the University of Wisconsin-Madison, May 2019

-*On the translates of general dyadic systems on R*, Undergraduate Mathematics Symposium, University of Illinois at Chicago, November 2018

## SERVICES

**Mentor for Directed Reading Program Project,** UW SPA 12/2020-

**Student Representative at Undergrad Statistics Committee,** UW-Madison 09/2017-05/2019

**Executive of the Undergraduate Statistics Club**, UW-Madison 01/2017-05/2019
**President** of the club since 05/2018

**Organizer** of UW-Madison Data Science Challenge 2018 11/2018
The first data challenged in UW-Madison

## COMPUTER SKILLS AND LANGUAGES

**Programming**: Proficient in R, Python, Matlab. Familiar with Java, SQL, C++, Mathematica

**Software**: Proficient in Excel. Familiar with ArcGIS, SPSS, STATA, SAS, GraphPad

**Languages:** English, Chinese (native)