# Jitian Zhao

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## Education

- **University of Wisconsin-Madison** — Madison, WI
  *Ph.D. in Statistics; GPA: 3.91* — *Sep. 2020 – present*
  *Master of Science in Data Science; GPA: 4.00* — *Aug. 2019 – May. 2020*
  *Visiting Student; GPA: 4.00* — *Aug. 2018 – May. 2019*
- **Zhejiang University** — Hangzhou, China
  *Bachelor of Science in Statistics; GPA: 3.71* — *Aug. 2015 – Jun. 2019*

## Work and Research Experience

- **Applied scientist intern** — May. 2022 - Sep. 2022
  *Amazon Alexa AI* — *Bellevue, WA*
  - **Cascade multi-task language model**: Proposed a novel transformer-based cascading multi-task learning (MTL) framework to expedite label auto-generation and improve human labeling efficiency. The unique structure enables easy-to-hard connections between tasks, achieving a 30% increase in relative accuracy for hard tasks compared to traditional MTL language models.
  - **Applications**: Improved labeling efficiency using Cascade MTL model by providing adaptive label hints based on previous task label selection. Collaborated on an interactive labeling API product and won top 10% in an organization-wide hackathon.
- **End-to-end structured prediction error analysis** — Sep. 2022 - present
  *Advised by Prof. Fred Sala* — *Madison, WI*
  - **Two-stage structured prediction algorithm**: Developed a two-stage structured prediction algorithm which incorporates an embedding algorithm to learn complicated label space geometries, followed by geodesic regression that leverages both the learned embedding and given features.
  - **End-to-end error analysis**: Provided an innovative end-to-end error analysis by establishing error rate guarantee for the embedding algorithm and geodesic regression generalization error analysis.
- **Bitcoin transaction network analysis** — Sep. 2022 - present
  *Advised by Prof. Karl Rohe* — *Madison, WI*
  - **Large-scale data preparation**: Retrieve large-scale bitcoin transaction data from database using SQL queries. Conduct address linking by extracting connected components in transaction network. Leveraged external information to accurately identify organizational ownership of wallets.
  - **Graph spectral analysis**: Performed graph spectral analysis on the aggregated transaction network to effectively cluster wallets. Study people's behaviour under anonymous transaction setting.
- **Citation graph analysis on semantic scholar dataset** — Sep. 2020 - Dec. 2020
  *Advised by Prof. Karl Rohe* — *Madison, WI*
  - **Journal clustering**: Aggregated the citation network of 220 millions papers by journals. Applied VSP (vintage sparse PCA) on the citation graph and obtained journal field membership based on citation patterns.
  - **Analysis methods**: Focused on the Statistics-related journal cluster and zoomed into paper-wise citation graph. Applied VSP and bff (best feature function) to obtain clustered statistical methods. Selected statistical methods of interest and tracked their development over time based on the appearance in papers' abstract.

## Skills

- **Software**: Proficient in Python and R, experienced in SQL, Matlab and C
- **Packages**: Pytorch, Transformers, Networkx, Geomstats, Pandas, Numpy
- **Related Experience**: Co-authored chapter *Transformers–Improving Natural Language Processing with Attention Mechanisms*, Sebastian Raschka, Hayden Liu, and Vahid Mirjalili. Machine Learning with PyTorch and Scikit-Learn Birmingham, UK: Packt Publishing, 2022. ISBN: 978-1801819312.
- **Related Coursework**: Mathematical Statistics, Statistical Learning, Regression and Analysis of Variance, Nonlinear Optimization, Theoretical Machine Learning, Algorithms

## Honor and Awards

- **2015-2016**: Zhejiang University Academic Excellence Award
- **2017**: Winner of the 15th Statistical Modeling Contest at Zhejiang University
- **2018-2019**: Exchange & Visiting International Student Academic Excellence Award at University of Wisconsin-Madison (twice)