# ZHENBANG JIAO

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## EDUCATION

**The Ohio State University** starting from 08/2020
Ph.D. in Statistics

**University of Michigan, Ann Arbor** 09/2018 - 05/2020
M.S. in Applied Statistics GPA: 4/4
Finished all required PhD courses in Applied Statistics and Theoretical Statistics

**Jilin University** 08/2014 - 07/2018
B.S. in Statistics GPA: 89.8/100, Ranking: 3/81
Real Analysis: 94; Mathematical Analysis: 96, 97; Advanced Algebra: 91, 96; Stochastic Process: 93

## SKILLS

Python (NumPy, pandas, PyTorch, scikit-learn, Scrapy)
R (tidyverse, Shiny), SQL, git, Julia, LaTeX, MATLAB

## RESEARCH EXPERIENCE

**Blue Sky Project: Solar Flares Prediction** 01/2019 - Present
*Graduate Student Research Assistant, Advisor: Prof. Yang Chen* *Dep of Statistics, UMich*

- Developed Hierarchical Multi-Scale LSTM and LSTM mixture models (combining classification and regression together) to predict solar flare intensity based on the JSOC data set
- Performed SVM and imagine processing techniques (edge detection, non maximum suppression and density based clustering) on video data to find the polarity inversion line (PIL) of each active region on the Sun
- Conducted case studies, ROC, cross validation and importance ranking for inference purpose

**Enrichment test on vaccination data** 06/2019 - 08/2019
*Research Assistant, Advisor: Prof. Lili Zhao* *Dep of Biostatistics, UMich*

- Firstly applied multiple GSEA (Gene Set Enrichment Analysis) algorithms on vaccination data and made corresponding modifications based on characteristics of the new data
- Designed simulation experiments to test the superiority of each algorithms

**An outlier-insensitive SVM algorithm using Sigmoid function** 12/2017 - 05/2018
*Undergraduate Thesis* *Mathematics School, Jilin University*

- Optimized SVM algorithm by substituting linear slack variables with Sigmoid function.
- Proved that new algorithm has better performance than C-SVM while processing datasets with more outliers

**A Study on the College Students' Public Opinion based on Data Mining** 05/2016 - 05/2017
*Research Project* *Mathematics School, Jilin University*

- Wrote crawlers using Python to retrieve large amounts of word vectors as training data from the college students BBS on the internet
- Cleansed the data and did Chinese word segmentation based on the corpus
- Used machine learning algorithms (Naive Bayes, AdaBoost) to analyze the data and filtered altitude and theme words from them

## WORK EXPERIENCE

**dMed Biopharmaceutical Co., Ltd., Shanghai, China** Summer 2017
*Statistical Analyst*

- Project: An R shiny application: DDCP (data-driven conditional power)
  - Employed Bayesian reasoning, predictive power, conditional power
  - Developed an APP to predict the success rates of clinical trials (including continuous, discrete and time-to-event types) using R Shiny
- Project: Verification of Phase II, III Seamless Design of a drug against Glioblastoma
  - Utilized group sequential design on sample size and information stage calculation
  - Applied Cox hazard proportional model to simulate the results and verify the safety and efficacy of the proposed clinical trial design
- Project: A clinical simulation of an ovarian cancer drug

**Jiangsu Provincial CDC, Nanjing, China** Summer 2016
*Research Assistant*

- Project: The application of immune-enzymatic technique on the diagnosis of SFTSV infection
  - Used TG-ROC to determine the cut-off value in a double antigen sandwich ELISA for the diagnosis of SFTSV infection
- Project: Detection of Shiga toxin 2 and its variants in Shiga toxin-producing Escherichia coli strains by a time-resolved fluorescence immunoassay
  - Proved the superiority of TRFIA compared to ELISA by performing regression analysis

**Product Dept. China Life Insurance Co., Ltd., Nanjing, China** 02/2017 - 03/2017
*Assistant Actuary Intern*

- Project: Travel inconvenience insurance pricing
  - Built short-term collective risk model to predict the sums of claims based on flight delay records collected from Nanjing Lukou International Airport
- Project: Post-sale survey of a short-term life insurance product in Yancheng

## PUBLICATIONS

1. **Jiao, Z.**, ..., Chen, Y., *Solar Flare Intensity Prediction with Machine Learning Models* accepted by *Space Weather* [arXiv:1912.06120]
2. Sun, H., Manchester, W., **Jiao, Z.**, ..., *Interpreting LSTM prediction on Solar Flare Eruption with Time-series Clustering* submitted to *Space Weather* [arXiv:1912.12360]
3. Wang, X., ..., **Jiao, Z.**, ..., *Predicting solar flares with machine learning: investigating solar cycle dependence* [arXiv:1912.00502]

(See details in **zbjiao.github.io/publications**)

## TEACHING EXPERIENCE

GSI (Graduate Student Instructor) for **STATS 426**: Introduction to Theoretical Statistics in 2020 Winter semester at UMich.