# Xiangyu Zhang

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## Education Background

**University of Minnesota, Twin Cities**                                                                                **MN**
*Ph.D., Statistics*                                                                              *Sep. 2020 - May. 2025 (Expected)*
**University of Minnesota, Twin Cities**                                                                                **MN**
*B.A., Mathematics, and Statistics, minor in Computer Science, with high distinction*                *Sep. 2016 - May. 2020*

## Experience

**Research Assistant**                                                                                            *Jun. 2021 - Present*
- **Distribution-free testing in parametric regression and goodness-of-fit tests**
  - Developed methods for testing mean function in a parametric regression setting when the distribution of the response/errors are unknown.
  - Similar methods are implemented to efficiently perform the goodness-of-fit tests against any postulated models and provided corrections of the models if the test get rejected.
  - Verified stochastic gravitational wave model postulated by physicists and achieved discovery of unknown astrophysical feathers on RT Cru star based on this method.
- **Spatial time series modeling for epidemic diseases**
  - Developed a new class of epidemiological spatial time series models for predicting the outbreaks and trends of epidemic diseases. Prediction and estimation of the model is mainly based on Sequential Monte Carlo and Extended Kalman filter.
  - Achieved early prediction of past pandemics (e.g. COVID-19) based on the wastewater data.

**Instructor and Teaching Assistant**                                                                         *Sep. 2020 - Present*
  - Instructor for an introductory-level course in statistical analyzing tools (Hypothesis Testing, Anova, etc.).
  - Teaching assistant for courses in machine learning, design of experiments, and statistical computing.

## Publications

- ***A novel approach to detect line emission under high background in high-resolution X-ray spectra***     *2023*

  - **Zhang X**., Algeri S., et al. Monthly Notices of the Royal Astronomical Society.

- ***Exhaustive goodness-of-fit via smoothed inference and graphics***     *2022*

  - Algeri S., **Zhang X**. Journal of Computational and Graphical Statistics.

- ***Rare disease awareness and perspectives of physicians in China: a questionnaire-based study***     *2021*

  - Li X., **Zhang X.**,et al. Orphanet Journal of Rare Diseases.

## Skills & Software

- Programming: R, Python, Pytorch, SAS, C, C++     ● Database: MySQL     ● Others: Algorithms, Data Structure, Unix, Git

- *LPbkg*, *Python package: Computationally tractable solutions for signal detection under background misspecification.*

- *LPsmooth*, *R package: Comprehensive implementation of the smooth tests of goodness-of-fit.*

## Honors & Awards

- Data Science Initiative-MnDRIVE Graduate Assistantship Award, $30,235 for outstanding Ph.D. candidate, 2023-2024.

- Summer Research Fellowship, $2,000 for first-year statistics Ph.D. students, 2021

- Buehler Memorial Scholarship, $2,000 for outstanding statistics undergraduate students, 2020

- Global Excellence Scholarship, $15,000 per year offered to excellent incoming students, 2016-2020

## Invited Talks

- Joint Statistical Meetings 2024, Portland, Oregon. August, 2024.

- International CHASC Astro-Statistics Collaboration, Harvard University, Cambridge, Massachusetts. February, 2024