

# JINGRU ZHANG

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## Contact Information

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## Employment

09/2019- Postdoctoral Fellow, Biostatistics  
University of Pennsylvania  
Advisors: Professors Hongzhe Li and Haochang Shou

## Education

09/2013- 07/2019 PhD, Computational Mathematics  
Beijing International Center for Mathematical Research,  
Peking University, Beijing, China  
Advisors: Professors Weinan E and Wei Lin  
09/2016-09/2017 Visiting Student  
Department of Statistics,  
University of California, Davis  
Advisor: Professor Hao Chen  
09/2009-07/2013 B.S., Applied Mathematics  
School of Mathematical Sciences,  
Nankai University, Tianjin, China  
Advisor: Professor Jishou Ruan

## Teaching Experience

03/2016-06/2016 Teaching Assistant, School of Mathematical Sciences, Peking University:  
Multivariate Statistical Analysis (graduate course)  
09/2015-01/2016 Teaching Assistant, School of Mathematical Sciences, Peking University:  
Mathematical Statistics (undergraduate course)  
03/2015-06/2015 Teaching Assistant, School of Mathematical Sciences, Peking University:  
Algorithms of Big Data Analysis (graduate course)  
03/2014-06/2014 Teaching Assistant, School of Mathematical Sciences, Peking University:  
Probability Theory (undergraduate course)  
09/2013-01/2014 Teaching Assistant, School of Mathematical Sciences, Peking University:  
Linear Algebra (undergraduate course)

## Honors and Awards

2019 Zhong Jiaqing outstanding paper award  
2018 Outstanding research award, Peking University  
2017 Outstanding research award, Peking University

## Talks

- “Empirical likelihood tests for variance components in linear mixed-effects models”, (online) JSM,

August 2021.

- “Two-sample tests for repeated measurements with applications to wearable device data”, (online) JSM, August 2020.
- “Principal subspace analysis for high-dimensional compositional data”, Beijing, Tianjin, and Hebei Youth Probability and Statistics Conference, University of International Business and Economics, Beijing, China, June 2019.
- “Graph-based two-sample tests for discrete data”, ICSA Applied Statistics Symposium, Rutgers University, New Jersey, USA, June 2018.

## Research Interests

High-dimensional statistics; Big and complex object data analysis; Compositional data analysis; Mobile health study and wearable device data; Collaborative biomedical research.

## Publications – papers published/accepted/under revision

1. **Jingru Zhang**, Kathleen R. Merikangas, Hongzhe Li, and Haochang Shou (2021). Two-sample tests for multivariate repeated measurements of histogram objects with applications to wearable device data. [arXiv preprint, arXiv:2106.12768](https://arxiv.org/abs/2106.12768). (Under 2<sup>nd</sup> revision for the *Annals of Applied Statistics*)
2. **Jingru Zhang** and Hao Chen (2020). Graph-based two-sample tests for data with repeated observations. [Statistica Sinica, DOI:10.5705/ss.202019.0116](https://doi.org/10.5705/ss.202019.0116).
3. **Jingru Zhang** and Wei Lin (2019). Scalable estimation and regularization for the logistic normal multinomial model. [Biometrics, 75\(4\), 1098-1108](https://doi.org/10.1111/biomet.12108).

## Manuscripts Submitted/in Preparation

1. **Jingru Zhang**, Hao Chen, and Xiao-Hua Zhou (2020). A new nonparametric test for multivariate paired data and pair matching. [arXiv preprint arXiv:2007.01497](https://arxiv.org/abs/2007.01497). (*Submitted*)
2. Xin Zhao, **Jingru Zhang**, and Wei Lin (2021). Clustering multivariate count data via Dirichlet-multinomial network fusion. (*Submitted*)
3. **Jingru Zhang** and Wei Lin (2021). Principal subspace analysis for high-dimensional compositional data. [arXiv preprint arXiv:2109.04657](https://arxiv.org/abs/2109.04657). (This paper won the 2019 Zhong Jiaqing outstanding paper award.)
4. **Jingru Zhang**, Mathias Basner, Christopher W. Jones, David F. Dinges, Haochang Shou, and Hongzhe Li (2021). Causal treatment effect estimation for outcomes measured with uncertainty. (*To be submitted*)
5. **Jingru Zhang**, Wei Guo, Joanne S. Carpenter, Nicholas G. Martin, Ian B. Hickie, Andrew Leroux, Kathleen R. Merikangas, Haochang Shou, and Hongzhe Li (2021). Empirical likelihood tests for variance components in linear mixed-effects models. (*To be submitted*)
6. **Jingru Zhang**, Wei Guo, Joanne S. Carpenter, Nicholas G. Martin, Ian B. Hickie, Andrew Leroux, Kathleen R. Merikangas, Haochang Shou, and Hongzhe Li (2021). Non-transient heritability inference based on repeated measures wearable device data. (*To be submitted*)

## Software (R Package)

gTests: Graph-based two-sample tests.

gTestsPair: Nonparametric tests for multivariate paired data and pair matching.

## Computer Skills

R, MATLAB, C/C++, Linux.