Zijian Guo

CONTACT INFORMATION	Hill Center 110 Frelinghuysen Road Piscataway, NJ 08854	(848)445-2690 zijguo@stat.rutgers.edu http://statistics.rutgers.edu/home/zijguo/

RESEARCH INTERESTS

High-dimensional inference, causal inference, nonparametric inference, econometrics and applications to health and genetics data analysis.

- Inference for high-dimensional regression
- Instrumental variable methods
- Nonparametric methods
- Efficient Data Imputation
- Mediation analysis
- Heritability and co-heritability analysis in genomics
- Electronic health data analysis

POSITIONS

Assistant Professor   Sep 2017-present
Department of Statistics
Rutgers, the State University of New Jersey

ACADEMIC VISITS

Visiting Scholar   Sep 209
Department of Biostatistics, TH Chan School of Public Health, Harvard University
Host: Tianxi Cai

Visiting Scholar   Nov 2018
Forschungsinstitut für Mathematik, ETH, Zürich
Host: Peter Bühlmann

Visiting Scholar   Aug 2017
Center for Statistics in Big Data, Perelman School of Medicine, Upenn
Host: Hongzhe Li

EDUCATION

Ph.D. Statistics, University of Pennsylvania   2017
Thesis advisor: T. Tony Cai

B.S. Mathematics, The Chinese University of Hong Kong   2012

GRANTS

- National Science Foundation #DMS 1811857 "Inference in High-Dimensional Linear Models: Methods, Theory and Applications."
    - Amount $120,000; Period: Aug 2018 to July 2021.
    - Role: Principal Investigator

- National Institute of Health #R56-HL-138306-01 "Statistics Methods for Analyzing Electronic Health Record Data."
    - Amount $53,301; Period: June 2018 to Aug 2018.
    - Role: Co-Investigator

- Upenn Medical School "Statistics Methods for Analyzing Electronic Health Record Data" Subcontract.
    - Amount $12,778; Period: June 2019.
    - Role: Senior Investigator

PUBLICATION   Published/Accepted Papers (* indicates alphabetical ordering authorship, citation=204)

1. *Cai, T. T., & **Guo, Z.** (2019). Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications. *Journal of the Royal Statistical Society: Series B*, to appear.

2. **Guo, Z.**, Kang, H., Cai, T. T., & Small, D. S. (2018). Testing Endogeneity with High Dimensional Covariates. *The Journal of Econometrics*, to appear.

3. **Guo, Z.**, Kang, H., Cai, T. T., & Small, D. S. (2018). Confidence Interval for Causal Effects with Invalid Instruments using Two-Stage Hard Thresholding. *Journal of the Royal Statistical Society: Series B*, to appear.

4. **Guo, Z.**, Wang, W., Cai, T. T., & Li, H. (2017). Optimal estimation of genetic relatedness in high-dimensional linear models. *Journal of the American Statistical Association*, to appear.

5. *Cai, T. T., & **Guo, Z.** (2017). Accuracy assessment for high-dimensional linear regression. *Annals of Statistics*, 46(4), 1807-1836.

6. *Cai, T. T., & **Guo, Z.** (2017). Confidence intervals for high-dimensional linear regression: Minimax rates and adaptivity. *Annals of Statistics*, 45(2), 615-646.

7. **Guo, Z.**, & Small, D. S. (2016). Control function instrumental variable estimation of nonlinear causal effect models. *Journal of Machine Learning Research*, 17(100), 1-35.

8. **Guo, Z.**, Small, D. S., Gansky, S. A., & Cheng, J. (2016). Mediation analysis for count and zero-inflated count data without sequential ignorability and its application in dental studies. *Journal of the Royal Statistical Society: Series C*, to appear.

9. Cheng, J., Cheng N. F., **Guo, Z.**, Gregorich, S., Amid I. I., & Gansky, S. A. (2016). Mediation analysis for count and zero-inflated count data. *Statistical Methods in Medical Research*, to appear.

10. **Guo, Z.**, Cheng, J., Lorch, S. A., & Small, D. S. (2014). Using an instrumental variable to test for unmeasured confounding. *Statistics in Medicine*, 33(20), 3528-3546.

11. **Guo, Z.**, Kogan, R., Qiu, H., & Strichartz, R. S. (2014). Boundary value problems for a family of domains in the Sierpinski gasket. *Illinois Journal of Mathematics*, 58(2), 497-519.

Technical Reports

12. *Cai, T. , Cai, T. T., & **Guo, Z.** (2019). Individualized Treatment Selection: An Optimal Hypothesis Testing Approach In High-dimensional Models. Under revision at *Journal of the Royal Statistical Society: Series B*.

13. **Guo, Z.** & Zhang, C. (2019). Extreme Nonlinear Correlation for Multiple Random Variables and Stochastic Processes with Applications to Additive Models. Under revision at *Stochastic Processes and their Applications*.

14. **Guo, Z.** & Zhang, C. (2019). Local Inference in Additive Models with Decorrelated Local Linear Estimator. Submitted to *Annals of Statistics*.

15. **Guo, Z.**, Renaux, C., Bühlmann, P., & Cai, T. T. (2019). Group Inference in High Dimensions with Applications to Hierarchical Testing. Submitted to *Journal of the American Statistical Association*.

16. **Guo, Z.**, Herman, D., and Chen, J. (2019). Inference for Case Probability in High-dimensional Logistic Regression. Submitted to *Journal of the American Statistical Association*.

SOFTWARE   **Two Stage Hard Thresholding (TSHT)**
R code is available at `http://stat.wharton.upenn.edu/~zijguo/Software.html`.

Functional Debiased Estimator (FDE)
R code is available at `http://statgene.med.upenn.edu/software.htm`.

TEACHING EXPERIENCE	**Instructor**

Instructor
- Rutgers University

FSRM 588: Financial Data Mining	Fall 2019
STAT 594: Advanced Modern Statistical Inference II	Spring 2019
Instructor Rating: 4.82 out of 5.0	
FSRM 588: Financial Data Mining	Fall 2018
Instructor Rating: 4.71 out of 5.0	
FSRM 588: Financial Data Mining	Fall 2017
Instructor Rating: 4.82 out of 5.0	

- The Wharton School, University of Pennsylvania

STAT 111 : Introductory Statistics	Summer 2016
Instructor Rating: 3.6 out of 4.0	

Recitation Instructor   Fall 2014
The Wharton School, University of Pennsylvania

STAT 111: Introductory Statistics

Teaching Assistant
The Wharton School, University of Pennsylvania

STAT 102: Business Statistics	Spring 2017
STAT 970: Mathematical Statistics	Fall 2016
STAT 622: Statistical Modeling	Spring 2016
STAT 550: Mathematical Statistics	Fall 2015

STUDENTS SUPERVISION

PhD Thesis Advisor: Prabrisha Rakshit (expected 2023)

PhD Thesis Committee: Sai Li (2018); Yisha Yao (expected 2020)

HONORS AND AWARDS

• ICSA New Researcher Awards, ICSA 2019	Dec. 2019
• IMS travel Award, JSM	Aug. 2017
• President Gutmann Leadership Award, University of Pennsylvania	Apr. 2017
• J. Parker Bursk Prize	Sept. 2016
Awarded by the Statistics Department at the Wharton School for excellence in research.	
• Statistics in Epidemiology Young Investigator Award, JSM	Aug. 2013
Awarded by the American Statistical Association section on Statistics in Epidemiology for the paper "Using an instrumental variable to test for unmeasured confounding."	
• Chung Chi College Departmental Prize, CUHK	2011
• Dr. Chao Yong Chi-hsing Scholarship in Mathematics, CUHK	2011
• Chung Chi Traveling Award in Mathematics, CUHK	2011
• Chung Chi Ivy League Exchange Scholarship, CUHK	2010
• Caring Alumni Student Exchange Scholarship, CUHK	2010
• Dean's List, College of Arts and Science, UPenn	2010
• Dean's Honors List, Faculty of Science, CUHK	2008, 2009
• Chung Chi College Scholarship, CUHK	2009
• Honors at Entrance to the Chinese University of Hong Kong (4 years)	2008

ACADEMIC SERVICE	• Department Retreat Chair (2019-2020), Department of Statistics, Rutgers

• Department Retreat Chair (2019-2020), Department of Statistics, Rutgers

• Department Seminar Chair (2018-2019), Department of Statistics, Rutgers

• Other Rutgers Committee service: Department retreat (2017-2018); FSRM (2017-2018, 2018-2019, 2019-2020); Ph.D. Exam (2019-2019, 2019-2020); Graduate Curriculum (2019-2020);

• Program Committee for ICSA 2019 11th International Conference

• Local Organizing Committee for 2018 ICSA Applied Symposium.

• Session organizer for 2019 Hangzhou Data Science Conference

• Session organizer for 2018 ICSA Applied Symposium.

• Reviewer for the following journals: *Annals of Statistics*, *JASA*, *JRSSB*, *Biometrica*, *Statistica Sinica*, *IEEE International Symposium on Information Theory*, *Journal of Applied Statistics*, *Biometrics*, *Journal of Machine Learning*, *COLT*.

TALKS

• Department seminar, Department of Statistics, East China Normal University, Hong Kong, China, *"Individualized Treatment Selection: A Hypothesis Testing Approach In High-dimensional Models"*, June. 2019

• Invited talk, 2019 Hangzhou Data Science Conference, Hangzhou, China, *"Local Inference in High-dimensional Sparse Additive Modeling"*, May. 2019

• Department seminar, School of Data Science, City University of Hong Kong, Hong Kong, China, *"Individualized Treatment Selection: A Hypothesis Testing Approach In High-dimensional Models"*, May. 2019

• Department seminar, ISOM, HKUST, Hong Kong, China, *"Local Inference in High-dimensional Sparse Additive Modeling"*, May. 2019

• Department seminar, Department of Statistics, University of Virginia, USA, *"Local Inference in High-dimensional Sparse Additive Modeling"*, March. 2019

• Invited Speaker, 2019 ICSA Data Science Conference, Xishuangbanna, Yunnan, China. *"Individualized Treatment Selection: A Hypothesis Testing Approach In High-dimensional Models"*, Jan. 2019

• Young Research Session, Memorial Workshop for Lawrence D. Brown, University of Pennsylvania, USA. *"Individualized Treatment Selection: A Hypothesis Testing Approach In High-dimensional Models"*, Nov. 2018

• Seminar for Statistics, Department of Mathematics, ETH, Swiss, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, Nov. 2018

• Department seminar, Department of Mathematics, NJIT, USA, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, Nov. 2018

• Department seminar, ORFE, Princeton, USA, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, Oct. 2018

• Department seminar, ISOM, HKUST, Hong Kong, China, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, July. 2018

• Department seminar, Department of Statistics, Naikai University, China, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, July. 2018

• Invited talk, IMS Asia Pacific Rim Meeting, Singapore, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, June. 2018

• Invited talk, HongKong EcoStat Conference, Hong Kong, China, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, June. 2018

• Invited talk, ICSA Symposium 2018, New Brunswick, USA, *"Semi-supervised Inference for*

Explained Variance in High-dimensional Linear Regression and Its Applications", June. 2018

• Invited talk, Purdue Symposium on Statistics, USA, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, June. 2018

• Invited talk, 2018 Hangzhou Data Science Conference, Hangzhou, China, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, May. 2018

• Invited talk, Lorentz Center, Leiden University, Netherlands, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, Apr. 2018

• Department seminar, Department of Statistics, Columbia University, *"Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications"*, Apr. 2018

• Topic contributed talk, Joint Statistical Meetings, Baltimore, USA, *"Optimal Estimation of Co-Heritability in High-Dimensional Linear Models"*, Aug. 2017

• Invited talk, Statistical Foundations of Uncertainty Quantification for Inverse Problem, Cambridge, *"Inference for Functionals in High-dimensional Linear Models"*, June. 2017

• Seminar, Center for Statistical Methods in Big Data, University of Pennsylvania, *"Inference with High-dimensional Covariates and Possibly Invalid Instruments"*, Apr. 2017

• Seminar, Institute of Data science, Fox Business School, Temple University, *"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Feb. 2017

• Department seminar, Department of Biostatistics, UC Berkeley, *"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Feb. 2017

• Department seminar, Department of Statistics & Biostatistics, Rutgers, *"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Feb. 2017

• Department seminar, Department of Statistics, University of Michigan,*"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Jan. 2017

• Department seminar, Department of Statistics, University of Minnesota, *"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Jan. 2017

• Department seminar, Department of Statistics, UIUC,*"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Jan. 2017

• Department seminar, DPMMS, University of Cambridge, *"Inference for High Dimensional Linear Regression: Fundamental Limits and Algorithms"*, Jan. 2017

• Department seminar, Department of Statistics, UC Santa Barbara, *"Inference for High Dimensional Linear Models: Fundamental Limits and Algorithms"*, Jan. 2017

• Invited talk, Mathematical Meeting in Statistics, Fréjus, France, *"Optimal Estimation of Genetic Correlation in High-dimensional Linear Models"*, Dec. 2016

• Econometrics Lunch, Department of Economics, University of Pennsylvania, *"Confidence Intervals for Treatment Effects in High-Dimensional Linear Models"*, Nov. 2016

• Contributed talk, Joint Statistical Meetings, Chicago, USA, *"Accuracy Assessment for High-dimensional Linear Regression"*, Aug. 2016

• Contributed talk, Eastern North American Region, Austin, USA, *"Confidence Intervals for High-Dimensional Linear Regression: Minimax Rates and Adaptivity"*, Mar. 2016

• Poster presentation, John W. Tukey Conference, Princeton University, *"Confidence Intervals for High-Dimensional Linear Regression: Minimax Rates and Adaptivity"*, Sept. 2015

• Contributed talk, Joint Statistical Meetings, Seattle, USA, *"Distance Matrix Estimation from Noisy Observation of Low Rank Position Matrix"*, Aug. 2015

• Contributed talk, Joint Statistical Meetings, Boston, USA, *"Instrumental Variable Approach for Mediation Analysis of Count Model"*, Aug. 2014

• Topic Contributed talk, Joint Statistical Meetings, Montreal, Canada, *" Instrumental Variable*

Approach for Mediation Analysis of Zero-Inflated Count Model", Aug. 2013

• Poster presentation, Atlantic Causal Inference Conference, Harvard University, *"Control Function Instrumental Variable Estimation of Nonlinear Causal Effect Models"*, May. 2013

MEMBERSHIPS
- American Statistical Association
- Institute of Mathematical Statistics
- International Chinese Statistical Association
- The Econometric Society