

# Zijian Guo

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CONTACT INFORMATION	Hill Center 110 Frelinghuysen Road Piscataway, NJ 08854	(848)445-2690 zijguo@stat.rutgers.edu <a href="http://statistics.rutgers.edu/home/zijguo/">http://statistics.rutgers.edu/home/zijguo/</a>
RESEARCH INTERESTS	High-dimensional inference, causal inference, econometrics, nonparametric inference and applications to health and genetics. <ul style="list-style-type: none"><li>• Inference in high-dimensional regression</li><li>• Robust instrumental variable methods</li><li>• Mediation analysis</li><li>• Nonparametric methods</li><li>• Semi-supervised Inference</li><li>• Heritability and co-heritability analysis in genomics</li><li>• Electronic health data analysis</li></ul>	
POSITIONS	<i>Assistant Professor</i> Department of Statistics Rutgers, the State University of New Jersey	Sep 2017-present
ACADEMIC VISITS	<i>Visiting Scholar</i> Department of Biostatistics, TH Chan School of Public Health, Harvard University <i>Host:</i> Tianxi Cai	Sep 2019
	<i>Visiting Scholar</i> Forschungsinstitut für Mathematik, ETH, Zürich <i>Host:</i> Peter Bühlmann	Nov 2018
	<i>Visiting Scholar</i> Center for Statistics in Big Data, Perelman School of Medicine, Upenn <i>Host:</i> Hongzhe Li	Aug 2017
EDUCATION	Ph.D. Statistics, University of Pennsylvania <i>Thesis advisor:</i> T. Tony Cai	2017
	B.S. Mathematics, The Chinese University of Hong Kong	2012
GRANTS	<ul style="list-style-type: none"><li>• National Science Foundation #DMS 1811857 “Inference in High-Dimensional Linear Models: Methods, Theory and Applications.”<ul style="list-style-type: none"><li>- Period: Aug 2018 to July 2021.</li><li>- Role: Principal Investigator</li></ul></li><li>• National Science Foundation #DMS 2015373 “Repro Sampling Method: A Transformative Artificial-Sample-Based Inferential Framework with Applications to Discrete Parameter, High-Dimensional Data, and Rare Events Inferences”<ul style="list-style-type: none"><li>- Period: July 2020 to June 2023.</li><li>- Role: Co-Principal Investigator</li></ul></li><li>• National Institute of Health #R56-HL-138306-01 “Statistics Methods for Analyzing Electronic Health Record Data.”<ul style="list-style-type: none"><li>- Period: June 2018 to Aug 2018.</li><li>- Role: Co-Investigator</li></ul></li></ul>	

- Upenn Medical School “Statistics Methods for Analyzing Electronic Health Record Data” Subcontract.
  - Period: June 2019.
  - Role: Senior Investigator

PUBLICATION Published/Accepted Papers (\* indicates alphabetical ordering authorship)

1. \*Cai, T. T., & **Guo, Z.** (2020). Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 82(2), 391-419.
2. **Guo, Z.**, Wang, W., Cai, T. T., & Li, H. (2019). Optimal estimation of genetic relatedness in high-dimensional linear models. *Journal of the American Statistical Association*, 114(525), 358-369.
3. **Guo, Z.**, Kang, H., Cai, T. T., & Small, D. S. (2018). Testing Endogeneity with High Dimensional Covariates. *The Journal of Econometrics*, 207(1), 175-187.
4. **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 (Statistical Methodology)*, 80(4), 793-815.
5. \*Cai, T. T., & **Guo, Z.** (2018). Accuracy assessment for high-dimensional linear regression. *Annals of Statistics*, 46(4), 1807-1836.
6. **Guo, Z.**, Small, D. S., Gansky, S. A., & Cheng, J. (2018). 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 (Applied Statistics)*, 67(2), 371-394.
7. Cheng, J., Cheng N. F., **Guo, Z.**, Gregorich, S., Amid I. I., & Gansky, S. A. (2018). Mediation analysis for count and zero-inflated count data. *Statistical Methods in Medical Research*, 27(9), 2756-2774.
8. \*Cai, T. T., & **Guo, Z.** (2017). Confidence intervals for high-dimensional linear regression: Minimax rates and adaptivity. *Annals of Statistics*, 45(2), 615-646.
9. **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.
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, Tianxi, 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.**, Renaux, C., Bühlmann, P., & Cai, T. T. (2019). Group Inference in High Dimensions with Applications to Hierarchical Testing. *Technical Report*.
15. **Guo, Z.** & Zhang, C. (2019). Local Inference in Additive Models with Decorrelated Local Linear Estimator. *Technical Report*.
16. **Guo, Z.**, Rakshit, P., Herman, D., & Chen, J. (2019). Inference for Case Probability in High-dimensional Logistic Regression. *Technical Report*.
17. **Guo, Z.**, Cévid, D., & Bühlmann, P. (2020). Doubly Debiased Lasso: High-Dimensional Inference under Hidden Confounding and Measurement Errors. *Technical Report*.

18. \*Cai, T. T., **Guo, Z.**, & Ma, R. (2020). Statistical Inference for High-Dimensional Generalized Linear Models with Binary Outcomes. *Technical Report*.

SOFTWARE R codes are available at <https://statistics.rutgers.edu/home/zijguo/Software.html>

1. **Two Stage Hard Thresholding (TSHT)**
2. **Functional Inference in High-dimensional Regression (FIHR)**

TEACHING  
EXPERIENCE

**Instructor**

- Rutgers University
  - FSRM 588: Financial Data Mining Spring 2020
  - FSRM 588: Financial Data Mining Fall 2019
  - Instructor Rating:* 4.75 out of 5.0
  - 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 Students and Post Doc Mentor<sup>1</sup>:** Domagoj Cevic (ETH); Jue Hou (Harvard); Molei Liu (Harvard); Lu Wang (Upenn); Rong Ma (Upenn); Claude Renaux (ETH); Ye Tian (Rutgers); Zheshi Zheng (Rutgers).

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

**Master Thesis Advisor:** Yankun Xu (2018); Yangdi Li (2018); Guanyu Huang (2018); Haoze Tang (2018); Wenzhe Zhang (2018); Yaran Su (2018); Xinyi Zhang (2018); Yuan Liang (2019); Hequan Zhang (2019); Qiaochu Chen (2019); Jiamin Deng (2019); Zeen Huo (2019); Jianyu Li (2020); Junjie Chen (2020).

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<sup>1</sup>I am mentoring these PhD students or Post Doc for one or multiple projects but not their advisor

HONORS AND AWARDS	• ICSA New Researcher Award, ICSA 2019	Dec. 2019
	• IMS travel Award, JSM	Aug. 2017
	• President Gutmann Leadership Award, University of Pennsylvania	Apr. 2017
	• J. Parker Bursk Prize <i>Awarded by the Statistics Department at the Wharton School for excellence in research.</i>	Sept. 2016
	• Statistics in Epidemiology Young Investigator Award, JSM <i>Awarded by the American Statistical Association section on Statistics in Epidemiology for the paper “Using an instrumental variable to test for unmeasured confounding.”</i>	Aug. 2013
	• 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 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 (2018-2019, 2019-2020); Graduate Curriculum (2019-2020);	
	• Organizing Committee for 2019 Rutgers Statistics Symposium	
	• 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: <i>Annals of Statistics, JASA, JRSSB, Biometrika, Statistica Sinica, IEEE International Symposium on Information Theory, Journal of Applied Statistics, Biometrics, Journal of Machine Learning, COLT.</i>	
TALKS	• Invited talk (virtual), JSM 2020, Philadelphia, USA, “ <i>Doubly Debiased Lasso: High-Dimensional Inference under Hidden Confounding and Measurement Errors.</i> ”, Aug 2020	
	• Department seminar (virtual), Department of Statistics, UC Davis, USA “ <i>Doubly Debiased Lasso: High-Dimensional Inference under Hidden Confounding and Measurement Errors.</i> ”, May 2020	
	• Upenn causal reading group (virtual), Upenn, USA, “ <i>Doubly Debiased Lasso: High-Dimensional Inference under Hidden Confounding and Measurement Errors.</i> ”, May 2020	
	• Department seminar, Department of Statistics, East China Normal University, Shanghai, China, “ <i>Group Inference in High Dimensions with Applications to Hierarchical Testing</i> ”, Dec 2019	
	• Invited talk, 11th ICSA International Conference, Hangzhou, China, “ <i>Group Inference in High Dimensions with Applications to Hierarchical Testing</i> ”, Dec 2019	
	• Invited talk, International Statistical Conference in Memory of Professor Sik-Yum Lee, Hong	

Kong, China, “*Group Inference in High Dimensions with Applications to Hierarchical Testing*”, Dec 2019

- Causal reading group (led by James Robins), School of Public Health, Harvard University “*Semi-supervised Inference for Explained Variance in High-dimensional Linear Regression and Its Applications*”, Sep. 2019
- Department seminar, Department of Statistics, East China Normal University, Shanghai, 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 Infer-*

ence 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, 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