

# Zhichao Jiang

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## POSITIONS

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*Assistant Professor* (Sep 2019 – )

Department of Biostatistics and Epidemiology, School of Public Health and Health Sciences  
University of Massachusetts, Amherst

*Postdoctoral Fellow* (Sep 2018 – Sep 2019)

Department of Government and Department of Statistics, Harvard University  
Advisor: Prof. Kosuke Imai

*Postdoctoral Research Associate* (Sep 2016 – Sep 2018)

Department of Politics and Center for Statistics and Machine Learning, Princeton University  
Advisor: Prof. Kosuke Imai

*Visiting Student* (Sep 2013 – Sep 2014)

Department of Epidemiology, Harvard T.H. Chan School of Public Health  
Advisor: Prof. Tyler J. VanderWeele

## EDUCATION

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*Ph.D., Statistics* – Peking University, 2016

Dissertation: Identification of principal stratification causal effects and surrogate evaluation  
Advisor: Prof. Zhi Geng

*B.S., Statistics, B.A., Economics* – Peking University, 2011

## RESEARCH INTERESTS

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Algorithmic fairness;  
Instrumental variable approaches: latent confounders, identifiability;  
Principal stratification: non-compliance, surrogate, truncation-by-death;  
Randomization-based analysis of experiments;  
Interference: spillover effect, contagious effect and infectiousness effect;  
Measurement error and misclassification in causal inference;  
Missing data: non-ignorable missing data mechanisms.

## GRANT SUPPORT

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- National Science Foundation (2021–2023). Evaluating the Impacts of Machine Learning Algorithms on Human Decisions. (Methodology, Measurement, and Statistics Program). Co-PI (with Kosuke Imai and James Greiner)
- Cisco Systems, Inc. (2020–2022). Evaluating the Impacts of Algorithmic Recommendations on the Fairness of Human Decisions. (Ethics in AI). Subcontract PI (with Kosuke Imai and James Greiner)

- UMass Interdisciplinary Faculty Research Awards (2020-2022). Intelligent 3D Optical Coherence Tomography for Assessment of Transplant Organ Viability. Co-PI (with Yu Chen and Xian Du)

## PUBLICATIONS

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\* Corresponding authorship

### Preprints

- Imai, K. and **Jiang, Z.** Principal Fairness for Human and Algorithmic Decision-Making. *Under review at Statistical Science.*
- **Jiang, Z.\***, Chen, S. and Ding, P. An Instrumental Variable Method for Point Processes: Generalized Wald Estimation Based on Deconvolution. *Submitted to Biometrika.*
- **Jiang, Z.** and Imai, K. Statistical Inference and Power Analysis for Direct and Spillover Effects in Two-Stage Randomized Experiments. *Technical report available at <https://arxiv.org/abs/2109.11679>*
- Ben-Michael, E., Greiner, J. Imai, K. and **Jiang, Z.** Safe Policy Learning Through Extrapolation: Application to Pre-Trial Risk Assessment. *Technical report available at <https://arxiv.org/abs/2011.07677>.*

### Refereed Journal Articles

20. **Jiang, Z.**, Yang, S. and Ding, P. (accepted). Multiply Robust Estimation of Causal Effects Under Principal Ignorability. *Journal of the Royal Statistical Society: Series B (Statistical Methodology).*
19. Imai, K., **Jiang, Z.**, Greiner, J., Halen, R. and Shin, S. (accepted). Experimental Evaluation of Algorithm-Assisted Human Decision-Making: Application to Pretrial Public Safety Assessment (With Discussion). *Journal of the Royal Statistical Society: Series A (Statistics in Society).*
18. **Jiang, Z.** and Ding, P. (2021). Identification of Causal Effects Within Principal Strata Using Auxiliary Variables. *Statistical Science*, **36**, 493–508.
17. Imai, K., **Jiang, Z.\*** and Malani, A. (2021). Causal inference with interference and noncompliance in the two-stage randomized experiments. *Journal of the American Statistical Association*, **116**, 632–644.
16. **Jiang, Z.** and Ding, P. (2020). Measurement errors in the binary instrumental variable model. *Biometrika*, **107**, 238–245.
15. Imai, K. and **Jiang, Z.\*** (2020). Identification and sensitivity analysis of contagion effects with randomized placebo-controlled trials. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, **183**, 1637–1657.
14. Imai, K. and **Jiang, Z.** (2019). Comment: The Challenges of Multiple Causes. *Journal of the American Statistical Association*, **114**, 1605–1610.
13. **Jiang, Z.** and VanderWeele, T. J. (2019). Causal mediation analysis in the presence of a misclassified binary exposure. *Epidemiologic Methods.*
12. Imai, K., and **Jiang, Z.\*** (2018). A sensitivity analysis for missing outcomes due to truncation-by-death under the matched-pairs design. *Statistics in Medicine*, **37**, 2907–2922.

11. **Jiang, Z.** and Ding, P. (2018). Using missing types to improve partial identification with application to a study of HIV prevalence in Malawi. *Annals of Applied Statistics*, **12**, 1831–1852.
10. Li, W., **Jiang, Z.**, Geng, Z. and Zhou, XH. (2018). Identification of causal effects in the presence of measurement error and latent confounding. *Biometrical Journal*, **60**, 498–515.
9. **Jiang, Z.** and Ding, P. (2017). The Directions of Selection Bias. *Statistics and Probability Letters*, **125**, 104–109.
8. **Jiang, Z.**, Ding, P. (2016). Robust modeling using non-elliptically contoured multivariate  $t$  distributions. *Journal of Statistical Planning and Inference*, **177**, 50–63.
7. **Jiang, Z.**, Ding, P. and Geng, Z. (2016). Principal causal effect identification and surrogate endpoint evaluation by multiple trials. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, **78**, 829–848.
6. **Jiang, Z.** and VanderWeele, T. J. (2015). When is the difference method conservative for mediation? (With discussion). *American Journal of Epidemiology*, **182**, 105–108.
5. **Jiang, Z.** and VanderWeele, T. J. (2015). Bounds or sensitivity analysis? Which to prefer for mediation? (Rejoinder to discussion). *American Journal of Epidemiology*, **182**, 115–117.
4. **Jiang, Z.**, Ding, P. and Geng, Z. (2015). Qualitative evaluation of associations by the transitivity of the association signs. *Statistica Sinica*, **25**, 1065–1079.
3. **Jiang, Z.** and VanderWeele, T. J. (2015). Causal mediation analysis in the presence of a mismeasured outcome. *Epidemiology*, **26**, e8–e9.
2. **Jiang, Z.**, VanderWeele T. J. (2015). Additive interaction in the presence of a mismeasured outcome. *American Journal of Epidemiology*, **181**, 81–82.
1. **Jiang, Z.**, Chiba, Y. and VanderWeele, T. J. (2014). Monotone confounding, monotone treatment selection, and monotone treatment response. *Journal of Causal Inference*, **2**, 1–12.

## INVITED PRESENTATIONS

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- Statistical Inference and Power Analysis for Direct and Spillover Effects in Two-Stage Randomized Experiments  
*Joint Statistical Meetings, virtual conference, invited, Aug 2021*
- Experimental Evaluation of Computer-Assisted Human Decision Making  
*Pacific Causal Inference Conference, virtual conference, Sep 2020*  
*ICSA Applied Statistics Symposium, virtual conference, Sep 2021*  
*Department of Statistics, University of Illinois Urbana-Champaign, Nov 2021*  
*Department of Biostatistics, Peking University, Nov 2021*  
*IMS Workshop: Causal Inference with Big Data, virtual, Dec 2021*  
*Southwestern University of Finance and Economics, March 2022*  
*School of Mathematical Sciences, Xiamen University, April 2022*  
*BIRS workshop, May 2022*
- Causal Inference with Interference and Noncompliance in the Two-Stage Randomized Experiments  
*Applied Statistics Workshop, Harvard University, Nov 2018*  
*Joint Statistical Meetings, Vancouver, Canada, Aug 2018*  
*Peking University, Beijing, China, Jul 2018*  
*Atlantic Causal Inference Conference, Pittsburgh, PA, May 2018*

- Using Missing Types to Improve Partial Identification with Missing Binary Outcomes  
*NESS, Hartford, CT, May 2019*  
*ENAR, Philadelphia, PA, Mar 2019*  
*EcoSta, HongKong, Jun 2018*
- Measurement errors in the binary instrumental variable model  
*EcoSta, Taichung, Jun 2019*
- Principal Surrogate Evaluation Using Multiple Trials  
*Department of Mathematics and Statistics, University of Massachusetts Amherst, Nov 2019*  
*Joint Statistical Meetings, virtual conference, topic-contributed, Aug 2020*

## PROFESSIONAL ACTIVITIES

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**Journal reviews:** *American Journal of Epidemiology, Annals of Applied Statistics, Annals of Statistics, Biometrics, Biometrika, Biostatistics, Biostatistics & Epidemiology, Computational Statistics and Data Analysis, Epidemiologic Methods, Journal of the American Statistical Association, Journal of the Royal Statistical Society, Statistics in Medicine, Statistical Methods in Medical Research, Scandinavian Journal of Statistics, Journal of Causal Inference, Journal of Business & Economic Statistics, International Journal of Epidemiology, Proceedings of the National Academy of Sciences, The Review of Economics and Statistics.*

**Consultant:** The Program for Quantitative and Analytical Political Science at Princeton University, 2017–2018

**Seminar organizer:** Causal reading group, Harvard University, 2018

**Session organizer:** Causal inference with interference, *Atlantic Causal Inference Conference*, Pittsburgh, PA, May 2018; Causal inference under interference, *Joint Statistical Meetings*, virtual, Aug 2021

**Session chair:** Recent developments for causal effect estimation in observational studies, *ICSA Applied Statistics Symposium*, New Brunswick, NJ, Jun 2018

## TEACHING

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Causal inference: special topics, *Instructor*, Spring 2020, Spring 2022, University of Massachusetts Amherst.

Introduction to data science using R, *Instructor*, Fall 2020, Spring 2021, Fall 2021, University of Massachusetts Amherst.