

CURRICULUM VITAE

Wang Miao

Assistant Professor	Science Building 1
Department of Probability and Statistics	Peking University
School of Mathematical Sciences	Beijing 100871, China
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Education

Ph.D. Statistics	Peking University	2017
	Advisor: Zhi Geng	
B.S. Mathematics and Applied Mathematics		
Minor in Philosophy	Peking University	2012

Experience

Assistant Professor	
2020–	School of Mathematical Sciences, Peking University
Assistant Professor	
2018–2020	Guanghua School of Management, Peking University
Postdoctoral Fellow	
2017–2018	Department of Biostatistics, Harvard University
Visiting Scholar	
2014–2016	Department of Biostatistics, Harvard University

Awards and Honors

2016	The Zhong Jiaqing Award of Best Paper	Chinese Society of Probability and Statistics
2016	President Scholarship	Peking University
2015	Visiting Student Scholarship	Harvard University
2015	Honor of Merit Student	Peking University
2015	Huawei Scholarship	Peking University
2014	Chinese Government Scholarship	China Scholarship Council
2013	Guanghua Scholarship	Peking University

Teaching

Instructor

Semiparametric Model	Spring 2022
Selected Topics on Advanced Statistics I	Spring 2021
R Programming and Data Graphics	Fall 2020
Introduction to Probability and Statistics	Spring 2020
R Programming and Data Graphics	Fall 2019
Introduction to Probability and Statistics	Spring 2019
Statistical Culture and Practice	Fall 2018

Teaching Assistant

2012, 2013 Fall	Computational Statistics
2013 Spring	Multivariate Statistical Analysis
2014 Spring	Software for Statistics
2015 Fall	Introduction to Statistics

Short Courses

Causal inference and missing data analysis.	Fudan University, July 2021; DMED, October 2021; Beihang University, December 2021.
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Advisees

Ph.d. students Xinyu Li 2018–; Yilin Li 2019–

M.S. students Yujing Gao 2018–2020

B.S. students Xugao Chen, Hongzi Li, Peiyu He, Ping Zhang, Hongyu Chen, Chenghao Li

Conferences Organizing

1. Session organizer, Atlantic Causal Inference Conference, May 2018. Causal inference with unobserved confounders.
2. Session organizer, Atlantic Causal Inference Conference, May 2017. Addressing unmeasured confounding using negative controls.

Referee

Biometrika; JASA; JRSSB; JRSSA; Statistics in Medicine; Biometrics; Statistica Sinica; Annals of Statistics; Epidemiologic Methods; Journal of Machine Learning Research; American Journal of Epidemiology; Journal of Statistical Planning and Inference; Statistical Papers; AI STAT; Management Science; Environmental Research; IEEE; Journal of Multivariate Analysis; Canadian Journal of Statistics; UAI 2022; Journal of Business & Economic Statistics; Scandinavian Journal of Statistics; Biostatistics & Epidemiology Statistics and Probability; Computational Statistics and Data Analysis.

Research Interests

- Causal inference: Proximal inference and Negative control; Confounding; Instrumental variable; Observational study; Synthetic control; Mediation; Sensitivity analysis
- Missing data analysis: Callback data; Nonignorable missing data
- Doubly robust estimation and semiparametric inference
- Big data and artificial intelligence
- Application of statistics in economic, epidemiological, and biomedical researches

Funding

Causal modeling and inference for studies without controls and mediation analysis,
National Natural Science Foundation of China (12071015), PI

Statistical Theory for Deep Learning and Causality-Driven Methods for Artificial Intelligence,
Beijing Natural Science Foundation (Z190001), Co-PI

Statistical Theory for Over-Parametrized Models and Causal Learning,
Beijing Academy of Artificial Intelligence (BAAI2019ZD0106), Co-PI

Peer-Reviewed Papers

- Miao, W., P. Ding, and Z. Geng (2016). Identifiability of normal and normal mixture models with nonignorable missing data. *Journal of the American Statistical Association* 111, 1673–1683

Winner of the Zhongjiaqing Best Paper Award given by Chinese Society of Probability and Statistics.

- Miao, W. and E. Tchetgen Tchetgen (2016). On varieties of doubly robust estimators under missingness not at random with a shadow variable. *Biometrika* 103, 475–482
- Miao, W. and E. Tchetgen Tchetgen (2017). Invited commentary: Bias attenuation and identification of causal effects with multiple negative controls. *American Journal of Epidemiology* 185, 950–953
- Miao, W., Z. Geng, and E. Tchetgen Tchetgen (2018). Identifying causal effects with proxy variables of an unmeasured confounder. *Biometrika* 105, 987–993
- Miao, W. and E. Tchetgen Tchetgen (2018). Identification and inference with non-ignorable missing covariate data. *Statistica Sinica* 28, 2049–2067
- Sun, B., L. Liu, W. Miao, K. Wirth, J. Robins, and E. Tchetgen Tchetgen (2018). Semiparametric estimation with data missing not at random using an instrumental variable. *Statistica Sinica* 28, 1965–1983

- 苗旺, 刘春辰, and 耿直 (2018). 因果推断的统计方法. *中国科学: 数学* 48, 1753–1778
- Geng, Z., Y. Liu, C. Liu, and W. Miao (2019). Evaluation of causal effects and local structure learning of causal networks. *Annual Review of Statistics and Its Application* 6, 103–124
- Liu, L., W. Miao, B. Sun, J. Robins, and E. Tchetgen Tchetgen (2020). Identification and inference for marginal average treatment effect on the treated with an instrumental variable. *Statistica Sinica* 30, 1517–1541
- Kuang, K., L. Li, Z. Geng, L. Xu, K. Zhang, B. Liao, H. Huang, P. Ding, W. Miao, and Z. Jiang (2020). Causal inference. *Engineering* 6, 253–263
- Shi, X., W. Miao, J. C. Nelson, and E. Tchetgen Tchetgen (2020). Multiply robust causal inference with double negative control adjustment for categorical unmeasured confounding. *Journal of the Royal Statistical Society: Series B* 82, 521–540
- Li, H., W. Miao, Z. Cai, X. Liu, T. Zhang, F. Xue, and Z. Geng (2020). Causal data fusion methods using summary-level statistics for a continuous outcome. *Statistics in Medicine* 39, 1054–1067
- Shi, X., W. Miao, and E. Tchetgen Tchetgen (2020). A selective review of negative control methods in epidemiology. *Current Epidemiology Reports* 7, 190–202
- Miao, W., W. Li, W. Hu, R. Wang, and Z. Geng (2021). Invited commentary: Estimation and bounds under data fusion. *American Journal of Epidemiology*, in press
- Li, X., W. Miao, F. Lu, and X.-H. Zhou (2021). Improving efficiency of inference in clinical trials with external control data. *Biometrics*, in press

Winner of the Best Paper Award on the 2021 National Annual Biostatistics Conference.

- Miao, W., W. Hu, E. L. Ogburn, and X. Zhou (2021). Identifying effects of multiple treatments in the presence of unmeasured confounding. *Journal of the American Statistical Association*, in press
- Tchetgen Tchetgen, E., O. Dukes, X. Shi, W. Miao, and D. Richardson (2022). Errors-in-variables bias in synthetic controls: a cautionary note and a potential solution. *American Journal of Epidemiology*, in press

- Sun, B. and W. Miao (2022). On semiparametric instrumental variable estimation of average treatment effects through data fusion. *Statistica Sinica* 32, 1–32
- Cui, Y., H. Pu, X. Shi, W. Miao, and E. Tchetgen Tchetgen (2020). Semiparametric proximal causal inference *Revision invited by Journal of the American Statistical Association*.
- Tchetgen Tchetgen, E., A. Ying, Y. Cui, X. Shi, and W. Miao (2020). An introduction to proximal causal learning *Revision invited by Statistical Science*.

Preprints

- Wang, R., Q. Wang, W. Miao, and X. Zhou (2020). Sharp bounds for variance of treatment effect estimators in the finite population in the presence of covariates
- Miao, W., L. Liu, Y. Li, E. Tchetgen Tchetgen, and Z. Geng (2019). Identification and semiparametric efficiency theory of nonignorable missing data with a shadow variable
- Shi, X., Z. Pan, and W. Miao (2021). Data integration in causal inference
- Miao, W., X. Shi, and E. Tchetgen Tchetgen (2018). A confounding bridge approach for double negative control inference on causal effects
- Ying, A., W. Miao, X. Shi, and E. Tchetgen Tchetgen (2021). Proximal causal inference for complex longitudinal studies

Winner of the David P. Byar Award in Biometrics Section in JSM2022.

- Shi, X., W. Miao, M. Hu, and E. Tchetgen Tchetgen (2021). On proximal causal inference with synthetic controls
- Li, W., W. Miao, and E. Tchetgen Tchetgen (2021). Identification and estimation of nonignorable missing outcome mean without identifying the full data distribution
- Wang, R., Q. Wang, and W. Miao (2021). A robust fusion-extraction procedure with summary statistics in the presence of biased sources
- Miao, W., X. Li, and B. Sun (2021). A stableness of resistance model for nonresponse adjustment with callback

Presentations

- Proximal inference for confounding adjustment. 第二十一次全国统计科学讨论会. Peking University, December 2021.
- A stableness of resistance model for nonresponse adjustment with callback data. IMS Workshop: Causal Inference with Big Data. National University of Singapore, December 2021;
The 2021 International Workshop on Statistical Theory and Related Fields. East China Normal University, December 2021.
- Causal inference, observational studies, and the 2021 Nobel Prize in economics. Microsoft Research Asia, December 2021;
Peking University, November 2021;
Renmin University of China, October 2021;
East China Normal University, October 2021;
Beijing Academy of Artificial Intelligence, November 2021.
- The role of callback data in nonresponse adjustment. The Wharton School, October 2021.
- Semiparametric inference for nonignorable nonresponse with paradata. The 2020 Pacific Causal Inference Conference, September 2021.
- Proximal and Null Treatments Approaches for Confounding Adjustment. Carnegie Mellon University, July 2021.
- An Introduction to Negative Control and Proximal Causal Learning. MRC Integrative Epidemiology Unit, University of Bristol, February 2021;
- Identification of effects of multiple treatments in the presence of unmeasured confounding. The 2020 Pacific Causal Inference Conference, September 2020;
Renmin University of China, October 2020;
The Wharton School, February 2021;
Capital Normal University, May 2021;
Southwestern University of Finance and Economics, May 2021;
Lorentz Center, Leiden University, December 2021;
人工智能的数学基础研讨会。Tongji University, October 2021,
CMStatistics, December 2021.

- Inference on effects of multiple causes with an unobserved confounder. Shanghai University of Finance and Economics, December 2019; Sun Yat-Sen University, December 2019.
- A shadow variable approach for analysis of nonignorable missing data. Nankai University, June 2019; University of Hong Kong, July 2019; Northeast Normal University, October 2019; Xiamen University, November 2019.
- Removing unmeasured confounding in air pollution studies with negative controls. International Chinese Statistical Association (ICSA) Applied Statistics Symposium, June 2018.
- A confounding bridge approach for double negative control inference of causal effects. Wharton School, May 2018.
- Testing causative hypotheses in the presence of unmeasured confounding. Atlantic Causal Inference Conference (ACIC), May 2017.
- Job talks: Negative control analysis and its application to air-pollution studies. Peking University, January 2017
Tsinghua University, January 2017
The University of Hong Kong, March 2017
- Identifying causal effects with negative controls. 10th International Chinese Statistical Association (ICSA) Conference, December 2016.
- Identification and inference of nonignorable missing covariate data. 3rd Taihu International Statistics Forum, July 2016.
- Identifiability of normal and normal mixture models with nonignorable missing data. 20th Chinese Young Statisticians Conference, May 2016.
- Restoration of causal effects with proxy variables of an unmeasured confounder. Harvard University, April 2016.
- Identification and doubly robust estimation of data missing not at random. National Institute of Statistical Sciences Workshop on Data Not Missing at Random, November 2015.
- Instrumental variable estimation of the marginal average effect of treatment on the treated. Eastern North Atlantic Region (ENAR) Meetings, March 2015.

- Recent progress in the literature on direct and indirect effects. Center for Computational Systems Biology, Fudan University, December 2013.
- Causal inference without ignorability. Jiangsu Normal University, November 2013.