

Lan Liu

CONTACT INFORMATION	School of Statistics University of Minnesota at Twin Cities 224 Church St Minneapolis 55455, USA	<i>Phone:</i> (919) 593-8505 <i>E-mail:</i> liux3771@umn.edu
RESEARCH INTERESTS	Causal inference, missing data analysis, clinical trials, doubly robust inference, Bayesian analysis, surrogate outcomes, measurement error, mediation analysis.	
POSITION	University of Minnesota at Twin Cities , Minneapolis, Minnesota, USA Assistant Professor, School of Statistics	Sept 2015–present
EDUCATION	Harvard University , Boston, MA, USA Postdoctoral Fellow, Causal Inference Program Biostatistics & Epidemiology Topic: Causal Inference with Instrumental Variable Advisor: Eric Tchetgen Tchetgen, PhD	Aug 2015
	University of North Carolina at Chapel Hill , Chapel Hill, North Carolina, USA Ph.D., Biostatistics Dissertation Topic: Causal Inference in the Presence of Interference Advisor: Michael G. Hudgens, PhD	Jul 2013
	University of Science and Technology of China , Hefei, Anhui, China B.S., Mathematics	Jul 2010
HONORS & AWARDS	ICSA Student Paper Award International Chinese Statistics Association ORISE Fellowship Food and Drug Administration Outstanding Students Scholarship University of Science and Technology of China	2013 June 2012 Summer 2006–2009

GRANTS

- “Unravel the Brain Activities With Novel Statistics Methods,” PI, single semester leave, College of Liberal Arts, University of Minnesota. full pay, 2018 fall
- “Efficient Regression Analysis for Brain Imaging Data,” PI, College of Liberal Arts, University of Minnesota. \$36,840, 2018 Jan–2019 June
- “Health, Neighborhood Context, and Mobility,” co-investigator, NICHD, NIH, Sep 19th 2017– May 31st 2021
- “The Efficient Boosting in Task-evoked fMRI Study,” PI, neuro imaging grant, College of Liberal Arts, University of Minnesota. \$8000, 2017 summer–2018 summer

PUBLICATIONS

* indicates student, visiting student;

† indicates corresponding author if not first author

Methodology

Published:

1. **L. Liu**, M. G. Hudgens, “Large Sample Randomization Inference of Causal Effects in the Presence of Interference”, (2014) *Journal of the American Statistical Association (JASA) Theory and Methods Section*, 109(505):288-301.
2. **L. Liu**, M. G. Hudgens, S. Becker-Dreps, (2016) “On Inverse Probability Weighted Estimators in the Presence of Interference”, *Biometrika*, 103 (4), 829-842.
3. Y. Yin*, **L. Liu**[†], Z. Geng, (2017+) “Assessing the Treatment Effect Heterogeneity with a Latent Variable”, accepted, in press at *Statistica Sinica*.
4. B. Sun, **L. Liu**, J. M. Robins, E. Tchetgen Tchetgen (2017+) “Doubly Robust Instrumental Variable Estimation in Missing not at Random Problems”, in press at *Statistica Sinica*.
5. **L. Liu**, W. Miao, B. Sun, J. M. Robins, E. Tchetgen Tchetgen (2017+) “Instrumental Variable Estimation of the Marginal Effect of Treatment on the Treated”, in press at *Statistica Sinica*.
6. **L. Liu**[†], M. G. Hudgens, B. Saul “Doubly Robust Estimation in Observational Studies with Interference”, in press at *Stat*.
7. Y. Yin*, **L. Liu**[†], Z. Geng, P. Luo “Optimal Criteria to Exclude the Surrogate Paradox and Sensitivity Analysis”, in press at *Scandinavian Journal of Statistics*.

Invited to make revision:

8. L. Ma*, Y. Yin*, **L. Liu**[†], Z. Geng “On the Individual Surrogate Paradox”, submitted to *Biostatistics*.
9. W. Miao, **L. Liu**, E. Tchetgen Tchetgen, Z. Geng “Identification and Doubly Robust Estimation of Data Missing Not at Random with an Ancillary Variable”, invited revision
10. W. Li*, Y. Gu, **L. Liu**[†] “Demystifying the Multiple Robustness”, submitted to *Biometrika*.
11. **L. Liu**, E. Tchetgen Tchetgen “Indirect Adjustment for Homophily Bias with a Negative Control Variable in Peer Effect Analysis”, submitted to *Biometrics*.

Submitted:

12. Z. Sun*, **L. Liu**[†] “Semiparametric Inference with Missing Not at Random Confounders”, submitted to *Statistica Sinica*
13. L. Ma*, **L. Liu**[†], Wei Y. “Envelope Methods with Ignorable Missing Data”, submitted to *JASA, Theory and Methods*
14. **L. Liu**, W. Li*, Z. Su, D. Cook, L. Vizioli, E. Yacoub, “The Efficiency Boosting via Envelope Chain for task-invoked fMRI study”, submitted to *JASA, Case Study*

Applications

1. S. Becker-Dreps, E. Amaya, **L. Liu**, G. Moreno, J. Rocha, R. Briceño, J. Alemán, M.G. Hudgens, C.W. Woods, D.J. Weber, (2014) “Changes in Childhood Pneumonia and Infant Mortality Rates Following Introduction of the 13-valent Pneumococcal Conjugate Vaccine in Nicaragua”, *The Pediatric Infectious Diseases Journal*, 33(6):637-642.
2. S. Becker-Dreps, M. Meléndez, **L. Liu**, L. E. Zambrana, M. Paniagua, D. J. Weber, M. G. Hudgens, M. Cáceres, R. Achi, C. Källestål, D. R. Morgan, F. Espinoza, R. Peña, (2013) “Community Diarrhea Incidence Before and After Rotavirus Vaccine Introduction in Nicaragua”. *The American Journal of Tropical Medicine and Hygiene*, 89(2), 246-250.
3. S. Becker-Dreps, F. Bucardo, S. Vilchez, L. E. Zambrana, **L. Liu**, D. J. Weber, R. Peña, L. Barclay, J. Vinjé, M. G. Hudgens, J. Nordgren, L. Svensson, D. R. Morgan, F. Espinoza, M. Paniagua, (2014) “Etiology of Childhood Diarrhea Following Rotavirus Vaccine Introduction: A Prospective, Population-based Study in Nicaragua”. *The Pediatric Infectious Disease Journal*, 33(11), 1156-1163.
4. S. Becker-Dreps, E. Amaya, **L. Liu**, J. Rocha, R. Briceño, G. Moreno, J. Aleman, M. G. Hudgens, C. W. Woods, D. Weber, (2015) “Impact of a combined pediatric and adult pneumococcal immunization program on adult pneumonia incidence and mortality in Nicaragua”. *Vaccine*, 33(1), 222-227.

5. N. Franceschini, R. Tao, **L. Liu**, S. Rutherford, K. Haack, L. Almasy, H. HH. Göring, S. Laston, E.T. Lee, L.G. Best, R. Fabsitz, S. A. Cole, K.E. North (2014) “Mapping of a Blood Pressure QTL on Chromosome 17 in American Indians of the Strong Heart Family Study”, *BMC Cardiovascular Disorders*, 14(1), 158.
6. J. Lines, A. Covelo*, R.G. Garcia, **L. Liu**, A. Araque (2018+) “Astrocytes provide homeostatic plasticity in endocannabinoid modulation solely observed in individual synapses”, *Frontiers in Cellular Neuroscience*, In press.

ADVISING

Students

- Ruoyi Zhu (Master)
- Yannan Pan (Master)
- Ryan Lerch (undergrad, honor thesis)
- Shengyu Jiang (Master)
- Hao Yuan (Master)

Dissertation committee

- Lin Zhang (PhD) Statistics, UMN (Advisor: Yuhong Yang)
- Chenglong Ye (PhD) Statistics, UMN (Advisor: Yuhong Yang)
- Yang Yang (Master) Statistics, UMN (Advisor: Zack Almquist)
- Yu Zhou (PhD) Statistics, UMN (Advisor: Lan Wang)
- Yin-Ting Chou (Master) Statistics, UMN (Advisor: Aaron Rendahl)
- Jincheng Zhou (PhD) Biostatistics, UMN (Advisor: Haitao Chu)
- Danning Zhang (Master) Statistics, UMN (Advisor: Xiaoou Li)
- Yuchen Chen (Master) Statistics, UMN (Advisor: Yuhong Yang)
- Amy Ko (Master) Statistics, UMN (Advisor: Xiaoou Li)
- Yi Liu (Master) Statistics, UMN (Advisor: Aaron Rendahl)
- Brandon Koch (PhD) Biostatistics, UMN (Advisor: David Vock, Julian Wolfson)
- Gretchen Saunders (Master) Statistics, UMN (Advisor: Nate Helwig)
- Kaibo Gong (PhD), Statistics, UMN (Advisor: Snigdhanu Chatterjee)
- Yuanyuan Jin (Master), Biostatistics, UMN, (Advisor: Ying Zhang)

- Xinpeng Shen (Master), Statistics, UMN (Advisor: Xiaoou Li)
- Miao Yu (Master), Statistics, UMN (Advisor: Rui Zhang)
- Allen Clark (Master), Statistics, UMN (Advisor: Charles Geyer)
- Xiaowan Liu (Master), Statistics, UMN (Advisor: Xiaoou Li)
- Yiyi Yin (Phd), Statistics, UMN (Advisor: Hui Zou)
- Wenjun Lang (Phd), Statistics, UMN (Advisor: Hui Zou)

PRESENTATIONS

1. “Parsimonious Regressions in Repeated Measures Analysis,” UCLA, statistics, March 2019 (invited)
2. “Efficiency Boosting in fMRI studies,” JSM, Vancouver, Aug 2018 (poster)
3. “Efficiency Boosting in fMRI studies,” SER, June 2018 (poster)
4. “Efficient Estimation in fMRI studies,” Department of Statistics, Peking University, June 2018 (invited)
5. “Efficient Estimation in fMRI studies,” Department of Biostatistics, University of Pennsylvania, Mar 2018 (invited)
6. “On the Surrogate Paradox,” Fred Hutch Research Institute, Mar 2018 (invited)
7. “On the Surrogate Paradox,” Department of Statistics, University of Missouri, Nov 2017 (invited)
8. “Optimal Criteria to Exclude the Surrogate Paradox and Sensitivity Analysis,” ICSA, Chicago, June 2017. (invited)
9. “Novel Criteria to Exclude the Surrogate Paradox and Their Optimalities,” ACIC, North Carolina, May 2017. (invited)
10. “Regression-Based Adjustment for Homophily Bias in Peer Effect Analysis,” ENAR, DC, March 2017. (invited)
11. “Novel Criteria to Exclude the Surrogate Paradox and Their Optimalities,” Department of Biostatistics, Harvard University, Nov 2016. (invited)
12. “Novel Criteria to Exclude the Surrogate Paradox and Their Optimalities,” Department of Statistics, University of Alberta, Canada, Oct 2016. (invited)
13. “Novel Criteria to Exclude the Surrogate Paradox and Their Optimalities,” Department of Statistics, University of Wisconsin at Madison, Sept 2016. (invited)

14. "Identification and Inference about the Marginal Average Effect of Treatment on the Treated With an Instrumental Variable," the Joint Statistical Meetings (JSM), Chicago, IL, Aug 2016. (invited)
15. "Doubly Robust Estimation of a Marginal Average Effect of Treatment on the Treated With an Instrumental Variable," Eastern North Atlantic Region (ENAR), Austin, TX, Mar 2016. (invited)
16. "Doubly Robust Estimation of a Marginal Average Effect of Treatment on the Treated With an Instrumental Variable," New Researcher Conference, Seattle, WA, Aug 2015.
17. "Doubly Robust Estimation of a Marginal Average Effect of Treatment on the Treated With an Instrumental Variable," Western North Atlantic Region (WNAR), Boise, ID, Jun 2015. (invited)
18. "Instrumental Variable Estimation of Average Treatment Effect on the Treated," Department of Biostatistics, Johns Hopkins University, Baltimore, MD, Oct 2014.
19. "Instrumental Variable Estimation of Average Treatment Effect on the Treated," Western North Atlantic Region (WNAR), Honolulu, HI, Jun 2014. (invited)
20. "Instrumental Variable Estimation of Average Treatment Effect on the Treated," Atlantic Causal Inference Conference (ACIC), Providence, RI, May 2014. (Poster Presentation)
21. "On Inverse Probability Weighted Estimators in the Presence of Interference," Eastern North Atlantic Region (ENAR), Baltimore, MD, Mar 2014.
22. "Causal Inference with Interference," Department of Statistics, Peking University (PKU), Beijing, China, Jan 2014.
23. "Toward Causal Inference with Interference," Department of Statistics, University of Science and Technology of China (USTC), Hefei, Anhui, China, Dec 2013.
24. "Causal Inference with Interference," Joint Statistics Conference (ICSA), Bethesda, MD, Jun 2013. (invited)
25. "Large Sample Randomization Inference of Causal Effects in the Presence of Interference," the Joint Statistical Meetings (JSM), Montreal, QC, Canada, Aug 2013. (Poster Presentation)
26. "Large Sample Randomization Inference of Causal Effects in the Presence of Interference," Atlantic Causal Inference Conference (ACIC), Boston, MA, May 2013. (Poster Presentation)
27. "Causal Inference with Interference," Eastern North Atlantic Region (ENAR), Orlando, FL, Mar 2013. (Poster Presentation)

28. “Causal Inference in the Presence of Interference,” International Conference on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro, NC, Oct 2012. (invited)

TEACHING

School of Statistics UMN

STAT 4052: Introduction to Machine Learning Spring 2019

Spring 2017, Fall 2017

STAT 4051: Applied Statistics Fall 2016

STAT 5021: Introduction to Probability and Statistics Spring 2016

Department of Biostatistics UNC-CH

BIOS 665: Analysis of Categorical Data, (Grader) Fall 2012

BIOS 500: Introduction to Biostatistics (Teaching Assistant) Fall 2011

REFREE

Journal of American Statistical Association, Statistics and Probability Letters, Biostatistics, Statistics in Medicine, American Journal of Epidemiology, Biometrics, Biometrika, Biometrical Journal, Statistical Methods in Medical Research, Computational Statistics and Data Analysis, Scandinavian Journal of Statistics, International Journal of Biostatistics,

Grant review: Research Grants Council

COMPUTATIONAL SKILLS

Software: SAS, R, WinBUGS, Matlab, Origin, Mathematica
Language: C/C++

SERVICES

PhD qualify exam committee Spring 2016

PhD admission committee Spring 2017

School Seminar committee Spring 2018

Curriculum committee Spring 2019

MEMBERSHIPS

International Biometric Society (Eastern North American Region)

International Chinese Statistical Association