

F. Richard Guo

CONTACT	Department of Statistics C-314 Padelford Hall University of Washington Seattle, WA 98195, United States	☎ +1-919-599-8219 ricguo@uw.edu http://unbiased.co.in
RESEARCH INTERESTS	Causal inference: selection of causal models, non-asymptotic and uniform inference, inference under irregularity, partial identification, graphical models and its relation to efficiency theory, Bayes and empirical Bayes methods.	
EDUCATION	University of Washington , Seattle, WA, USA Ph.D., Statistics Sept 2017 – June 2021 (expected) <ul style="list-style-type: none">• Thesis Topic: <i>Likelihood analysis of causal models</i>• Candidacy: <i>On testing marginal versus conditional independence</i> (Z.W. Birnbaum award)• Advisor: Thomas S. Richardson Massachusetts Institute of Technology , Cambridge, MA, USA Graduate student, EECS 2016–2017 Duke University , Durham, NC, USA M.S., Computer Science 2016 University of Electronic Science and Technology of China , Chengdu, China B.Eng., Computer Science and Technology 2013	
AWARDS	Department of Statistics, University of Washington <ul style="list-style-type: none">• Z.W. Birnbaum award for outstanding candidacy/general exam, 2019–2020 Massachusetts Institute of Technology <ul style="list-style-type: none">• Ashar Aziz Presidential Fellowship, 2016–2017	
PREPRINTS	[1] F. R. Guo and Emilija Perković. Efficient least squares for estimating total effects under linearity and causal sufficiency. arXiv:2008.03481 , 2020. [2] F. R. Guo , James McQueen and Thomas S. Richardson. Empirical Bayes for large-scale randomized experiments: a spectral approach. arXiv:2002.02564 , 2020.	
PEER-REVIEWED PUBLICATIONS	[3] F. R. Guo and Emilija Perković. Minimal enumeration of all possible total effects in a Markov equivalence class. <i>International Conference on Artificial Intelligence and Statistics (AISTATS)</i> , 2021. [4] F. R. Guo and Thomas S. Richardson. Chernoff-type concentration of empirical probabilities in relative entropy. <i>IEEE Transactions on Information Theory</i> , 2020. DOI:10.1109/TIT.2020.3034539	

Last update: January 22, 2021

- [5] [F. R. Guo](#) and Thomas S. Richardson. On testing marginal versus conditional independence. *Biometrika*, 107(4):771-790, 2020. DOI:10.1093/biomet/asaa040
- [6] Song Qi, Demis Hassabis, Jiayin Sun, [F. Guo](#), Nathaniel Daw and Dean Mobbs. How cognitive and reactive fear circuits optimize escape decisions in humans. *Proceedings of the National Academy of Sciences*, **115** (12) 3186-3191, 2018. DOI:10.1073/pnas.1712314115
- [7] [F. Guo](#), Dan Yang, Zimo Yang, Zhi-Dan Zhao and Tao Zhou. Bounds of memory strength for power-law series. *Physical Review E*, **95**, 052314, 2017. DOI:10.1103/PhysRevE.95.052314
- [8] [F. Guo](#), Xiangyu Wang, Kai Fan, Tamara Broderick and David B. Dunson. Boosting variational inference. *NeurIPS Workshop on Advances in Approximate Bayesian Inference*, 2016.
- [9] [F. Guo](#), Charles Blundell, Hanna Wallach and Katherine Heller. The Bayesian Echo Chamber: modeling social influence via linguistic accommodation. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2015.
- [10] [F. Guo](#) and David B. Dunson. Uncovering systematic bias in ratings across categories: a Bayesian approach. *ACM Conference on Recommender Systems (RecSys)*, 2015.
- [11] Xiangyu Wang, [F. Guo](#), Katherine Heller and David B. Dunson. Parallelizing MCMC with random partition trees. *International Conference on Neural Information Processing Systems (NeurIPS)*, 2015.

INVITED TALKS

- [1] Causal effects in MPDAGs: identification and efficient estimation (with Emilija Perković). Machine learning virtual retreat and open house, University of Washington, Nov 2020.
- [2] Efficient least squares for estimating total causal effects. [Pacific Causal Inference Conference \(online\)](#), Sept 2020.
- [3] Possible causal effects: enumeration and estimation. [Statistics Seminar](#), University of Washington, May 2020.
- [4] Empirical Bayes for A/B testing and meta-analysis: a spectral approach. [CSSS Seminar](#), University of Washington, May 2020.
- [5] On testing marginal versus conditional independence. [Causal Inference Working Group](#), University of Washington, Oct 2019.
- [6] Boosting variational inference. [NeurIPS Workshop on Adaptive and Scalable Nonparametric Methods in Machine Learning](#), Dec 2016.

SOFTWARE

eff2: R package for efficiently estimating causal effects from observational data.
InvariantCausal.jl: Julia package for invariant causal prediction.

TEACHING
EXPERIENCE

University of Washington, Seattle

Instructor

Summer quarter, 2020

- STAT/MATH 394 (undergraduate Probability I): 3 credits, 48 students
- STAT/MATH 395 (undergraduate Probability II): 3 credits, 50 students

Teaching Assistant

Spring quarter, 2018

- STAT/MATH 395 (undergraduate Probability II)

PROFESSIONAL
SERVICE

Referee

- *Annals of Statistics*
- *Journal of Machine Learning Research*
- *Journal of the American Statistical Association*
- *Statistics and Computing*
- *Conference on Uncertainty in Artificial Intelligence (UAI)*
- *International Conference on Artificial Intelligence and Statistics (AISTATS)*
- *Neural Information Processing Systems (NeurIPS)*
- *International Conference on Machine Learning (ICML)*

INDUSTRY
EXPERIENCE

Amazon.com, Seattle

Research Scientist Intern

- Developed large-scale generative time series models based on quantile regression and neural networks Summer 2018
- Developed empirical Bayes methods for A/B testing Summer 2019

REFERENCES

Dr. Thomas S. Richardson (thomasr@uw.edu)

- Professor, Department of Statistics, University of Washington

Dr. Jon A. Wellner (jonw@uw.edu)

- Professor Emeritus, Department of Statistics, University of Washington

Dr. Mathias Drton (mathias.drton@tum.de)

- Professor and Chair, Mathematical Statistics, Technical University of Munich

Dr. Emilija Perković (perkovic@uw.edu)

- Assistant Professor, Department of Statistics, University of Washington