P. Richard Hahn

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Research areas

Bayesian methods, causal inference, regression trees, machine learning, semi-supervised learning, latent variable models, applications to social, behavioral and health sciences.

Employment

2017-now	Associate Professor, Arizona State University
2015-2017	Associate Professor, University of Chicago Booth School of Business
2011-2015	Assistant Professor, University of Chicago Booth School of Business

Education

2007-2011	PHD in Statistical Science, Duke University.
2005-2006	MSc in Mathematics, New Mexico Institute of Mining and Technology.
2002-2005	BA in Economics and Philosophy, Columbia University.

Grants

Funded

2019-2021	Facebook grant "Fast multilevel regression trees for heterogeneous effect estimation." Investigator recognition: $49,859.
2019-2024	DARPA project "Diagnostic Epigenetics of Infectious agents and Chemical Toxicity." Head of the modeling team. Investigator recognition: $256,135.

Unfunded

2019	U.S. Department of Education. "Statistical tools for identifying subgroups that are most likely to benefit from educational interventions." Investigator recognition: $265,208.
2019	National Science Foundation. "Tree-based regression methods for scientific inference: experiments, implementation, and theory." Investigator recognition: $337,983.
2019	National Science Foundation. "Statistical tools for identifying subgroups that are most likely to benefit from interventions." Investigator recognition: $394,306.
2019	National Institutes of Health. "Inference, Analytics, and the Training of 21st Century Behavioral and Social Science Researchers." Investigator recognition: $55,780.
2019	National Science Foundation."Efficient algorithms for Bayesian tree models for classification and regression." Investigator recognition: $183,938.
2018	National Science Foundation. "Accelerating Bayesian Tree Ensemble Models for Large-Scale Data Analysis." Investigator recognition: $775,026.

Papers

Journal articles

2020   Ruocheng Guo, Lu Cheng, Jundong Li, P. Richard Hahn, and Huan Liu. "A survey of learning causality with data: problems and methods." *ACM Computing Surveys.*

2020   Michelle Xia, P. Richard Hahn, and Paul Gustafson. "A Bayesian mixture of experts approach to covariate misclassification." *Canadian Journal of Statistics.*

2020   P. Richard Hahn, Jared Murray, and Carlos M. Carvalho. "Bayesian regression tree models for causal inference: regularization, confounding, and heterogeneous effects." *Bayesian Analysis.*

2019   David Yeager, et al. "A national experiment reveals where a growth mindset improves achievement." *Nature*, 573, 364-369.

2019   David Puelz, P. Richard Hahn and Carlos Carvalho. "Portfolio Selection for Individual Passive Investing." *Applied Stochastic Models in Business and Industry*

2019   Jingyu He, Saar Yalov, and P. Richard Hahn. "Accelerated Bayesian additive regression trees." In the *22nd International Conference on Artificial Intelligence and Statistics*, 1130-1138.

2019   Amir Bashir, Carlos M. Carvalho, P. Richard Hahn, and M. Beatrix Jones. "Post-processing posteriors over precision matrices to produce sparse graph estimates." *Bayesian Analysis.*

2018   P. Richard Hahn, Jingyu He, and Hedibert Lopes. "Efficient sampling for Gaussian linear regression with arbitrary priors." *Journal of Computational and Graphical Statistics*, 28 (1), 142-154.

2018   P. Richard Hahn, Stephen G. Walker, and Ryan Martin. "On recursive Bayesian predictive distributions." *Journal of the American Statistical Association*, 113:523, 1085-1093.

2017   P. Richard Hahn, Carlos M. Carvalho, Jingyu He, and David Puelz. "Regularization and confounding in linear regression for treatment effect estimation." *Bayesian Analysis*, 13 (1), 163-182.

2017   David Puelz, P. Richard Hahn, and Carlos M. Carvalho. "Variable selection in seemingly unrelated regressions with random predictors." *Bayesian Analysis*, 12 (4), 969-989.

2017   P. Richard Hahn, Jingyu He, and Hedibert Lopes. "Bayesian factor model shrinkage for linear IV regression with many instruments." *Journal of Business and Economic Statistics*, 36 (2), 278-287.

2016   P. Richard Hahn, Jared S. Murray, and Ioanna Manolopoulou. "A Bayesian partial identification approach to inferring the prevalence of accounting misconduct." *Journal of the American Statistical Association*, 111 (513), 14-26.

2015   P. Richard Hahn, Carl F. Mela, and Indranil Goswami. "A Bayesian hierarchical model for inferring player strategy types in a number guessing game." *Annals of Applied Statistics*, 9 (3), 1459-1483.

2015   P. Richard Hahn and Carlos M. Carvalho. "Decoupling shrinkage and selection in Bayesian linear models: a posterior summary perspective." *Journal of the American Statistical Association*, 110 (509), 435-448.

2013   P. Richard Hahn, Carlos M. Carvalho, and Sayan Mukherjee. "Partial factor modeling: predictor-dependent shrinkage for linear regression." *Journal of the American Statistical Association*, 108 (503), 999-1008.

2012   P. Richard Hahn, Carlos M. Carvalho, and James G. Scott. "A sparse factor analytic probit model for congressional voting patterns." *Journal of the Royal Statistical Society: Series C*, 61 (4), 619-635.

Under review

2020   Jingyu He and P. Richard Hahn. "Stochastic tree ensembles for regularized nonlinear regression." *Journal of the American Statistical Association.*

2020   Lane F. Burgette, P. Richard Hahn and David Puelz. "A symmetric prior for multinomial probit models." *Bayesian Analysis.*

Unpublished technical reports

2015   P. Richard Hahn. "Predictivist Bayes density estimation."
2015   Joseph Gerakos, P. Richard Hahn, Andrei Kovrijnykh, and Frank Zhou. "To what extent do going concern opinions induce bankruptcy?"
2013   P. Richard Hahn and Lane F. Burgette. "An approximate likelihood for simultaneous nonlinear quantile regression."
2011   P. Richard Hahn, Carl Mela, and Kristian Lum. "A semiparametric model for assessing cognitive hierarchy theories of beauty contest games."

Miscellaneous

2015   P. Richard Hahn. Review of "Bayesian inference in the social sciences". *Journal of the American Statistical Association*, 110 (512), 1819.
2018   P. Richard Hahn. Review of "Quantitative Social Science: An Introduction" by Kosuke Imai. *The American Statistician.*
2018   P. Richard Hahn. Op-ed "Statistics and data science degrees: Overhyped or the real deal?" *The Conversation.*

Software

2020   Accelerated Bayesian causal forests (xbcf) R package.
2019   Accelerated Bayesian additive regression trees (xbart) R and Python packages.
2018   Bayesian causal forests (bcf) R package.
2019   Bayesian linear models (bayeslm) R package.

Talks

03/2020   15th Brazilian Meeting of Bayesian Statistics, Maresias, Brazil.
07/2019   Joint Statistical Meetings, Denver, Colorado.
05/2019   Northwestern University, Department of Statistics.
12/2018   International Conference on Computational and Methodological Statistics, Pisa, Italy.
10/2018   University of Texas, Department of Statistics.
10/2018   Joint Statistical Meetings, Vancouver, British Columbia.
05/2018   Atlantic Causal Inference Conference.
12/2017   NIPS Workshop on Causal Inference and Machine Learning.
10/2017   Joint Statistical Meetings, Baltimore, Maryland.
06/2017   RAND corporation, Santa Monica, California.
06/2017   International Chinese Statistical Association Meeting, Chicago, Illinois.
06/2017   International Society for Business and Industrial Statisticas Conference at IBM, Armonk, New York.
01/2017   Virginia Tech, Department of Statistics.
12/2016   University of New Mexico, Department of Mathematics and Statistics.
10/2016   Arizona State University, Department of Mathematical and Statistical Sciences.
10/2016   Northern Illinois University, Department of Statistics.
08/2016   Joint Statistical Meetings, Chicago, Illinois.
04/2016   Seminar on Bayesian Inference in Econometrics and Statistics, University of Pennsylvania.
05/2016   University of Montreal, Department of Economics.
03/2016   University of Michigan, Interdisciplinary Seminar in Quantitative Methods.
02/2016   Brigham Young University, Department of Statistics.
01/2016   New Mexico Institute of Mining and Technology, Department of Mathematics.
01/2016   University of New Mexico, Department of Mathematics and Statistics.

12/2015	University of Wisconsin Milwaukee, Lubar School of Business.
08/2015	Joint Statistical Meetings, Seattle, Washington.
07/2015	Facebook Core Data Science Group.
11/2014	Indiana University, Department of Statistics.
06/2014	California Institute of Technology Microeconomics Seminar.
05/2014	Seminar on Bayesian Inference in Econometrics and Statistics, Chicago Illinois.
11/2013	University of Chicago, Statistics Department Consulting Seminar.
09/2013	Purdue University, Department of Economics.
06/2013	Classification Society Meeting, Milwaukee, Wisconsin.
05/2013	University of Southern California Marshall School of Business Statistics Seminar.
04/2013	University of Texas McCombs School of Business.
04/2013	University of Illinois Urbana-Champaign, Department of Statistics.
03/2013	Virginia Tech, Department of Statistics.
03/2013	Iowa State University, Department of Statistics.
06/2012	International Society for Bayesian Analysis World Meeting, Kyoto, Japan.
06/2010	International Society for Bayesian Analysis World Meeting, Benidorm, Spain.
05/2010	Seminar on Bayesian Inference in Econometrics and Statistics, Austin, Texas.
04/2010	Colorado School of Mines, Department of Mathematics and Computer Science.

Teaching

Courses

2017-now	Graduate level Causal inference, Arizona State University, SoMSS
2017-now	Graduate level Bayesian inference, Arizona State University, SoMSS
2017	Introduction to Data Science with R, University of Chicago, Booth School of Business
2016	Graduate level Bayesian inference, University of Chicago, Booth School of Business
2011-2017	Business statistics, University of Chicago, Booth School of Business

Mentoring

Masters students

2020	Austin Gregory, SoMSS
2019	Saar Yalov, SoMSS
2019	Kushal Kapadia, SoMSS
2019	Xiaoyang Ji, SoMSS
2016	Christina Fan, University of Chicago, Physical Science Division
2016	Jingyu He, University of Chicago, Department of Statistics

Training grant advisees

2019-2020	Andrew Herren. SoMSS Research Training Grant
2019	Nikolay Krantsevich. SoMSS summer block grant
2019	Meijia Wang. SoMSS summer block grant
2019-2020	Chelsea Kennedy. SoMSS Research Training Grant
2018-2019	Demetrios Papakostas. SoMSS Research Training Grant
2018-2019	Esther Boyle. SoMSS Research Training Grant
2018	Jinhui Xu, SoMSS, summer block grant

2020	Jingyu He, University of Chicago Booth School of Business.
2023	Xiangwei Peng, SoMSS (expected)
2024	Ashley Barth, SoMSS (expected)
2024	Andrew Herren. SoMSS (expected)
2023	Nikolay Krantsevich. SoMSS (expected)
2023	Chelsea Kennedy. SoMSS (expected)
2023	Demetrios Papakostas. SoMSS (expected)
2022	Meijia Wang. SoMSS (expected)
2022	Qijia Yun. SoMSS (expected)

2020	Oliver Risch, ASU, Barrett Honors College (expected)
2019	CiCi McCallester, ASU, Barrett Honors College
2018	Joel Krukar, ASU, Barrett Honors College

Service

2013 - now   Associate editor for *Journal of the American Statistical Association, Reviews.*

The American Statistician
Annals of Statistics
Annals of Applied Statistics
Artificial Intelligence and Statistics
Bayesian Analysis
Biometrics
Biometrika
Brazilian Journal of Probability and Statistics
Canadian Journal of Statistics
Electronic Journal of Statistics
International Statistical Review
Journal of the American Statistical Association
Journal of Applied Econometrics
Journal of Business and Economic Statistics
Journal of Econometrics
Journal of Machine Learning Research
Journal of the Royal Statistical Society
Marketing Science
Neural Information Processing Systems
PLOS One
Statistics in Medicine
Statistical Science
Statistica Sinica.

2019	Design and Analysis of Experiments
2017	Atlantic Causal Inference Conference Data Analysis Challenge
2016	Center for Accounting Research and Education Conference on Fraud
2014	Seminar on Bayesian Inference in Econometrics and Statistics
2013	Artificial Intelligence and Statistics