P. Richard Hahn

Arizona State University
School of Mathematical and Statistical Sciences
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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

2024-now Professor, Arizona State University
2017-2024 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.

Papers

Journal articles

2025 Komura, Toshiaki, P. Richard Hahn, and Kosuke Inoue. "Heterogeneity in the Depression Risk Associated with Spousal Cardiovascular Events." SSM-Mental Health.

2023 Meijia Wang, P. Richard Hahn, and Jingyu He. "Local Gaussian process extrapolation for BART models with applications to causal inference." *Journal of Computational and Graphical Statistics.*

2023 Nikolay Krantsevich, Jingyu He, and P. Richard Hahn. "Stochastic tree ensembles for estimating heterogeneous effects." *Artificial Intelligence and Statistics.*

2023 Demetrios Papakostas, P. Richard Hahn, Jared Murray, Frank Zhou, and Joseph Gerakos. "Do forecasts of bankruptcy cause bankruptcy? A machine learning sensitivity analysis." *Annals of Applied Statistics.*

2023 Chelsea Krantsevich, P. Richard Hahn, Yi Zheng, and Charles Katz. "Bayesian decision theory for tree-based adaptive screening tests with an application to youth delinquency." *Annals of Applied Statistics.*

2021 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.*

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

2025 Herren, Andrew, P. Richard Hahn, Jared Murray, and Carlos Carvalho. "StochTree: BART-based modeling in R and Python." arXiv preprint arXiv:2512.12051.

2025 Andrew Herren and P. Richard Hahn. "True versus estimated propensity scores with discrete controls: a finite sample analysis"

2025 Alcantara, Rafael, P. Richard Hahn, Carlos Carvalho, and Hedibert Lopes. "A Bayesian Additive Regression Tree Model for Learning Conditional Average Treatment Effects in Regression Discontinuity Designs"

Unpublished technical reports

2024 Meijia Wang, Ignacio Martinez, and P. Richard Hahn. "LongBet: Heterogeneous Treatment Effect Estimation in Panel Data."

2022 Andrew Herren and P. Richard Hahn. "Statistical Aspects of SHAP: Functional ANOVA for Model Interpretation."

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

2023 P. Richard Hahn and Andrew Herren. Invited Discussion of "Causal inference under mis-specification: adjustment based on the propensity score" by Stephens, et al. *Bayesian Analysis*.

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.*

Book Chapters

2022 Hugh Chipman, Edward I. George, P. Richard Hahn, Robert E. McCulloch, Matthew Pratola, Rodney Sparapani. "Computational Approaches to Bayesian Additive Regression Trees." *Computational Statistics in Data Science.* Chapter 21, pages 297 - 324.

2021 Carlos M. Carvalho, Edward I. George, P. Richard Hahn, Robert E. McCulloch. "Variable Selection and Interaction Detection with Bayesian Additive Regression Trees." *Handbook of Bayesian Variable Selection.*

Software

2024 Stochastic Trees (stochtree) `R` and Python packages.

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

04/2024 Sandia National Laboratories Statistics Group.

05/2023 University of California Santa Barbara Department of Statistics.

05/2023 Francesca Domenici Lab, Harvard School of Public Health.

04/2023 Machine Learning Day, Arizona State University West Campus.

04/2023 University of Arizona Department of Epidemiology and Biostatistics.

01/2023 Purdue University Statistics Department.

01/2023 Brigham Young University Statistics Department.

011/2022 Rice University Statistics Department.

08/2022 Google Economics Working Group.

07/2022 Foundation Medicine Statistics Working Group.

05/2022 Salem Center for Policy, University of Texas.
07/2021 Purdue University Krannert-Statistics Workshop on Machine Learning and Causal Inference.
07/2021 Lawrence Livermore National Laboratory Data Science Summer Institute.
06/2021 International Society for Bayesian Analysis.
06/2021 Google Economics Working Group.
04/2021 Arizona State University Machine Learning Day.
03/2021 Arizona State University Center for Technology, Data, and Society.
01/2021 University of Connecticut, Department of Statistics.
10/2021 University College London, Department of Statistical Science.
09/2020 Bayesian Analysis Discussion Paper.
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

Graduate level Bayesian 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
2016 Christina Fan, University of Chicago, Physical Science Division
2016 Jingyu He, University of Chicago, Department of Statistics

Training grant advisees

2024 Ernest Agyemang Duah. SoMSS, summer block grant
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

Doctoral students

2020 Jingyu He, University of Chicago Booth School of Business.
2023 Andrew Herren, SoMSS
2023 Chelsea Krantsevich, SoMSS
2023 Demetrios Papakostas, SoMSS
2023 Nikolay Krantsevich, SoMSS
2023 Meijia Wang, SoMSS (2024)
2024 Palak Jain, SoMSS (2024)
2025 Xiangwei Peng, SoMSS (expected)
2025 Qijia Yun, SoMSS (expected)

Undergraduate honors theses

2023 Sophia Blavatsky, ASU, Barrett Honors College
2022 Raphael David, ASU, Barrett Honors College
2020 Oliver Risch, ASU, Barrett Honors College
2019 CiCi McCallester, ASU, Barrett Honors College
2018 Joel Krukar, ASU, Barrett Honors College

Service

Editorial

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

Refereeing

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.

Conference organizing

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

Departmental

2023 - now Organized Data-Oriented Mathematics and Statistics Seminar.
2020 - now Graduate Committee Statistics Group representative.
2021 Chair of Search Committee for Data Science Clinical Assistant Professor position.
2021 Chair of Data Science Steering committee.
2019-2020 Developed Curriculum for New Data Science Degree (with Rob McCulloch and Don Jones)
2018-2020 Organized Statistics Seminar Series
2019 Judged for The Institute for Social Science Research Poster Contest
2018 Participated in ASU Open Door Event