Sameer K. Deshpande

May 2024

CONTACT

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RESEARCH INTERESTS

Bayesian hierarchical modeling. Bayesian treed regression. Model selection. Causal inference. Applications in public health and sports.

EMPLOYMENT

University of Wisconsin–Madison, Dept. of Statistics — Madison, WI
Assistant Professor — August 2021 – present

Massachusetts Institute of Technology, CSAIL — Cambridge, MA
Postdoctoral Associate — September 2018 – August 2021
Supervisor: Tamara Broderick

EDUCATION

University of Pennsylvania, The Wharton School — Philadelphia, PA
Ph.D., Statistics — May 2018
Thesis Title: "Bayesian model selection and estimation without MCMC"
Thesis Supervisors: Ed George and Veronika Ročková

Massachusetts Institute of Technology — Cambridge, MA
S.B., Mathematics — June 2013

PRE-PRINTS

Kokandakar, A.H., Lin, Y., Jin, S., Weiss, J. Rabinowitz, A.R., Buford may, R.A., Small, D., and **Deshpande, S.K.**. (2024). "Adolescent sports participation and health in early adulthood: An observational study"

Alexandr, Y., Bakenhus, M., Curiel, M., **Deshpande, S.K.**, Gross, E., Gu, Y., Johnson, J., Kagy, B., Karwa, V., Li, J., Lyu, H., Petrovic, S., Rodriguez, J.I. (2024+). "New directions in algebraic statistics: Three challenges from 2023." [arXiv:2402.13961].

Deshpande, S.K.. (2024+). "flexBART: Flexible Bayesian regression trees with categorical predictors." [arXiv:2211.04459].

Shen, Y. and **Deshpande, S.K.**. (2024+). "On the posterior contraction of the multivariate spike-and-slab LASSO." [arXiv:2209.04389].

Deshpande, S.K., Bai, R., Balocchi, C., Starling, J.E., and Weiss, J. (2024+). "VCBART: Bayesian trees for varying coefficients." [arXiv:2003.06416].

PUBLICATIONS

Shen, Y., Solís-Lemus, C., and **Deshpande, S.K.**. (2024). "Estimating sparse direct effects in multivariate regression with the spike-and-slab LASSO." *Bayesian Analysis* (accepted). [arXiv:2207.07020]. DOI:10.1214/24-BA1430

Deshpande, S.K., Ghosh, S., Nguyen, T.D., and Broderick T. (2024). "Are you using test log-likelihood correctly?" *Transactions of Machine Learning Research* (accepted). [arXiv:2212.00219].

Kokandakar, A.H., Lin, Y., Jin, S., Weiss, J. Rabinowitz, A.R., Buford may, R.A., Small, D., and **Deshpande, S.K.** (2024). "Pre-analysis protocol for an observational study on the effects of adolescent sports participation on health in early adulthood." *Observational Studies.* (accepted). [arXiv:2211.02104].

Yee, R. and **Deshpande, S.K.**(2023). "Evaluating plate discipline in Major League Baseball with Bayesian Additive Regression Trees." *Journal of Quantitative Analysis in Sports.* [arXiv:2305.05752]. DOI:10.1515/jqas-2023-0048.

Brill, R.S., **Deshpande, S.K.**, Wyner, A.J. (2023). "A Bayesian analysis of the time through the order penalty in baseball." *Journal of Quantitative Analysis in Sports.* [arXiv:2210.06724]. DOI:10.1515/jqas-2022-0116.

Smoliga, J., **Deshpande, S.K.**, and Binney, Z.O. (2023). "Interaction of surface type, temperature, and week of season on concussion risk in the National Football League: A Bayesian analysis." *Epidemiology.* DOI:10.1097/EDE.0000000000001657.

Kokandakar, A.H., Kang, H., and **Deshpande, S.K.**. (2023). "Sensitivity of Bayesian causal forests to modeling choices: A re-analysis of the 2022 ACIC Data Challenge." *Observational Studies.* 9(3):29–41. Journal link. [arXiv:2211.02020].

Balocchi, C., **Deshpande, S.K.**, George, E.I., and Jensen, S.T. (2022). "Crime in Philadelphia: Bayesian clustering with particle optimization." *Journal of the American Statistical Association.* 118(542):818–829. DOI:10.1080/01621459.2022.2156348. [arXiv:1912.00111]. Winner of 2023 *JASA* Reproducibility award.

Trippe, B.L., **Deshpande, S.K.**, and Broderick, T. (2022). "Confidently comparing estimators with the c-value." *Journal of the American Statistical Association.* (in press). DOI:10.1080/01621459.2022.2153688. [arXiv:2102.09705].

Lin, Y., Heng, S., Anand, S., **Deshpande, S.K.**, and Small, D.S. (2022). "Hemoglobin levels among male agricultural workers: analyses from the Demographic and Health Surveys to investigate a marker for chronic kidney disease of uncertain etiology." *Journal of Occupational and Environmental Medicine.* 64(12): e805–e810. [medRxiv:2021.09.14.21263584. DOI:10.1097/JOM.0000000000002703

Stephenson, W.T., Ghosh, S., Nguyen, T.D., Yurochkin, M, **Deshpande, S.K.**,and Broderick, T. (2022). "Measuring the robustness of Gaussian processes to kernel choice." *AISTATS 2022.* [arXiv:2106.06510]

Jin, S., Rabinowitz, A.R., Weiss, J., **Deshpande, S.K.**, Gupta, N., May, R.A.B., and Small, D.S. (2021). "Retrospective survey of youth sports participation: development and assessment of reliability using school records." *PLOS ONE.* 16(9): e0257487. DOI:10.1371/journal.pone.0257487.

Weiss, J., Rabinowitz, A.R., **Deshpande, S.K.**, Hasegawa, R.B., and Small, D.S. (2021). "Participation in collision sports and cognitive aging among Swedish Twins." *American Journal of Epidemiology.* 190(12): 2604–2611. DOI:10.1093/aje/kwab177.

Ghosh, S., Stephenson, W.T., Nguyen, T.D., **Deshpande, S.K.**, and Broderick, T. (2020). "Approximate cross-validation for structured models." *NeurIPS 2020* [arXiv:200612669].

Hasegawa, R.B, **Deshpande, S.K.**, Rosenbaum, P.R., Small, D.S. (2020). "Causal

inference with two versions of treatment." *Journal of Educational and Behavioral Statistics*. 45(4): 426 – 445. DOI: 10.3102/1076998620914003. [arXiv:1705.03918]

Deshpande, S.K., Hasegawa, R.B., Weiss, J., and Small, D.S. (2020). "The association between football participation in adolescence and mental health in early adulthood." *PLOS ONE*. 15(3): 1–14. DOI: 10.1371/journal.pone.0229978.

Deshpande, S.K.and Evans, K.E. (2020). "Expected hypothetical completion probability." *Journal of Quantitative Analysis in Sports*. 16(2): 85–94.
DOI: 10.1515/jqas-2019-0050. [arXiv:1910.12337].

Gaulton, T.G., **Deshpande, S.K.**, Small, D.S., Neuman, M.D. (2020). "Observational study of the association between participation in high school football and self-rated health, obesity, and pain in late adulthood." *American Journal of Epidemiology*. 186(6): 592–601. DOI: 10.1093/aje/kwz260.

Deshpande, S.K., Ročková, V., George, E.I. (2019) "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." *Journal of Computational and Graphical Statistics*. 28(4): 921–931. DOI:10.1080/10618600.2019.1593179. [arXiv:1708.08911].

Deshpande, S.K.and Wyner, A.J. (2017). "A hierarchical Bayesian model of pitch framing." *Journal of Quantitative Analysis in Sports*. 13(3): 95–112. **Editor's Choice article**. DOI: 10.1515/jqas-2017-0027. [arXiv:1704.00823].

Deshpande, S.K., Hasegawa, R.B., Rabinowitz, A.R., Whyte, J., Roan, C.L., Tabatabaei, A., Baiocchi, M., Karlawish, J.H., Master, C.L., and Small, D.S. (2017). "Association of playing high school football with cognition and mental health later in life." *JAMA Neurology*. 74(8): 909–918. DOI:10.1001/jamaneurol.2017.1317.

Deshpande, S.K.and Jensen, S.T. (2016). "Estimating an NBA player's impact on his team's chances of winning," *Journal of Quantitative Analysis in Sports*. 12(2): 51–72. **Editor's Choice article**. DOI:10.1515/jqas-2015-0027.[arXiv:1604.03186]

HONORS & AWARDS

JASA Reproducibility Award 2023.
Awarded for our article "Crime in Philadelphia: Bayesian clustering with particle optimization."

Significant Contributor Award, ASA Section on Statistics in Sports (2021).

Third Prize, Ruth and William Silen, M.D. Poster Award, New England Science Symposium (2019).

Finalist, National Football League Big Data Bowl (2019).

Deming Student Scholar Award, Deming Conference on Applied Statistics (2017).

J. Parker Bursk Memorial Award for excellence in research, Statistics Department, Wharton (2017).

Donald S. Murray Prize for excellence in teaching, Statistics Department, Wharton (2016).

Wharton Doctoral Program Fellowship, Wharton (2013).

Travel Awards: O'Bayes (2017), BNP12 (2019), O'Bayes (2019), Bayes Comp (2020)

TEACHING **University of Wisconsin – Madison**

STAT 628: *Data Science Practicum*	Spring 2024
STAT 775: *Bayesian Statistics*	Spring 2022, Fall 2022, Spring 2024
STAT 992: *Bayesian nonparametrics*	Fall 2023
STAT 775: *Introduction to Bayesian Decision and Control I*	Spring 2022, Fall 2022
STAT 479: *Introduction to Bayesian Data Analysis*	Fall 2021

DEPARTMENT SEMINARS

20 March 2024 "Beyond axis-alignment: Realizing the power of Bayesian Additive Regression Trees in general spaces." Seminario de probabilidad y procesos estocásticos, National Autonomous University of Mexico.

17 Oct. 2023 "Sparse regression and graphical modeling with the spike-and-slab LASSO". Dept. of Plant Pathology, University of Wisconsin–Madison.

12 Oct. 2023 "Beyond axis-alignment: Realizing the power of Bayesian Additive Regression Trees in general spaces." Dept. of Statistics, University of South Carolina.

28 Aug. 2023 "Revisiting pitch framing with BART." Data-Oriented Mathematical and Statistical Sciences Seminar, Arizona State University

3 Feb. 2023 "A new BART prior for flexible modeling with categorical covariates." Dept. of Statistics, Purdue University

13 Dec. 2022 "A new BART prior for structured categorical inputs." Dept. of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania.

8 Dec. 2022 "A new BART prior for structured categorical inputs." Econometrics & Statistics Colloquium, University of Chicago Booth School of Business

19 Sept. 2022 "A new BART prior for flexible modeling with categorical covariates." Dept. of Statistics, Iowa State University

28 Oct. 2021 "The Multivariate Spike-and-Slab LASSO." Dept. of Mathematics & Statistics, Loyola University of Chicago.

22 Sept. 2021 "Revisiting pitch framing with Bayesian Additive Regression Trees." Sports Analytics Lab, University of Virginia.

19 Feb. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, University of California, Santa Cruz.

9 Feb. 2021 "VCBART: Bayesian trees for varying coefficients." Kaiser Permanente Washington Health Research Institute.

1 Feb. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, University of Wisconsin–Madison.

5 Feb. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Mathematics. Texas State University.

22 Jan. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, Texas A&M University.

21 Jan. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, University of California, Irvine.

19 Jan. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, National University of Singapore.

19 Jan. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics and Data Science, Yale University.

15 Jan. 2021 "VCBART: Bayesian trees for varying coefficients." Dept. of Statistics, University of Washington.

14 Dec. 2020 "VCBART: Bayesian trees for varying coefficients." Dept. of Biostatistics, Boston University

7 Dec. 2020 "VCBART: Bayesian trees for varying coefficients." Dept. of Mathematics, Wake Forest University.

30 Nov. 2020 "VCBART: Bayesian trees for varying coefficients." Dept. of Biostatistics, St. Jude Children's Research Hospital.

18 Sept. 2020 "Estimating the health consequences of playing football using observational data." Applied Probability and Statistics Seminar, University of St. Thomas.

Jan. 2020 "Bayesian clustering with particular optimization." Dept. of Statistics and Data Science, University of Texas at Austin.

13 Jan. 2020 "Bayesian clustering with particular optimization." Dept. of Biostatistics, Louisiana State University

CONFERENCE TALKS *: invited lecture.

December 2023 "BART for network-linked data." ICSDS, Lisbon, Portugal.

December 2023* "BART for network-linked data." CMStatistics, Berlin, Germany.

August 2023* "A new BART prior for flexible modeling of areal spatial data." AMMCS VI in Waterloo, Canada.

August 2023* "Updating the first graduate Bayesian course: Balancing foundations, applied modeling, and computing." Joint Statistical Meetings in Toronto, Canada.

July 2023* "Sparse Gaussian chain graphs with the spike-and-slab LASSO." EcoSta 2023 in Tokyo, Japan.

July 2023* "Sparse Gaussian chain graphs with the spike-and-slab LASSO." ISI World Statistics Congress in Ottawa, Canada.

June 2023* "A new BART prior for flexible modeling with categorical predictors." WNAR in Anchorage, Alaska.

June 2023* "Estimating heterogeneous treatment effects on binary outcomes with noncompliance using Bayesian additive regression trees." IISA in Golden, Colorado.

March 2023* "A new BART prior for flexible modeling with categorical predictors." BayesComp in Levi, Finland

December 2022* "A new BART prior for flexible modeling with categorical predictors." CMStatistics in London, U.K.

October 2022 "Measuring the sensitivity of Gaussian processes to kernel choice." 13th International Conference on Bayesian Nonparametrics in Puerto Varas, Chile

July 2022* "Revisiting pitch framing with Bayesian Additive Regression Trees". EURO in Espoo, Finland

July 2022* "A new BART prior for flexible modeling with categorical predictors." ISBA in Montreal, Canada.

September 2021 "VCBART: Bayesian trees for varying coefficients." European Seminar on Bayesian Econometrics (online)

August 2021 "VCBART: Bayesian trees for varying coefficients." SBIES (online)

August 2021* "Revisiting pitch framing with Bayesian Additive Regression Trees." Award talk. Joint Statistical Meetings (online)

November 2019* "Expected hypothetical completion probability." CMU Sports Analytics Conference at Carnegie Mellon University

August 2019* "Estimating the health consequences of playing football using observational data." Joint Statistical Meetings in Denver, Colorado.

June 2019 "Approximate multiple shrinkage for clustered regression." 12th International Conference on Bayesian Nonparametrics at Oxford University.

June 2019* "Estimating the health consequences of playing football using observational data." Workshop on Bayesian causal inference at the Ohio State University.

May 2019 "Estimating the health consequences of playing football using observational data." New England Statistics Symposium in Hartford, Connecticut.

November 2018* "Estimating the health consequences of playing football using observational data." CMU Sports Analytics Conference at Carnegie Mellon University.

August 2018 "Bayesian spatial clustering with particle optimization." Joint Statistical Meetings in Vancouver, Canada.

July 2018* "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." ISBA in Edinburgh, Scotland.

July 2018* "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." EcoSta in Hong Kong.

May 2018 "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." Seminar on Bayesian Inference in Econometrics at Stanford University.

March 2018* "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." BayesComp in Barcelona, Spain

December 2017* "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." CMStatistics in London, U.K.

August 2017 "Simultaneous variable and covariance selection with the multivariate spike-and-slab LASSO." Joint Statistical Meetings in Baltimore, Maryland

August 2016 "A hierarchical model of pitch framing." Joint Statistical Meetings in Chicago, Illinois

September 2015 "A Bayesian hierarchical model to estimate the framing ability of Major League Baseball catchers." New England Symposium on Statistics in Sports at Harvard University

January 2015 "Estimating an NBA player's impact on his team's chances of winning." Joint Mathematics Meetings in San Antonio, Texas.

August 2014 "Estimating an NBA player's impact on his team's chances of winning." Joint Statistical Meetings in Boston, Massachusetts.

SERVICE

Student supervision: Yunyi Shen, Paul Nguyen, Ryan Yee, Mingya Huang, Saloni Bhogale, Ajinkya Kokandakar (UW–Madison)

Ph.D. dissertation committee: Chan Park, Peng Yu, Tun Lee Ng, Yanbo Shen, Kehui Yao (UW–Madison).

Professional organizations

Secretary, Wisconsin Chapter of the ASA September 2023–present.

Workshop organizer:

Your model is wrong: robustness & misspecification in probabilistic modeling
NeurIPS 2021 Workshop December 2021

Perspectives in statistical modeling and inference
A workshop in honor of Ed George's 70th birthday December 2021

Journal Reviewer: Journal of the American Statistical Association, Annals of Applied Statistics, Journal of Machine Learning Research, Journal of Computational and Graphical Statistics, Bayesian Analysis, Spatial Statistics, Journal of Multivariate Analysis, Statistics and Computation, Journal of Quantitative Analysis in Sport, Australian & New Zealand Journal of Statistics, PLOS ONE, Harvard Data Science Review, STAT.

Conference Reviewer: BNP@NeurIPS 2018, UAI 2019, AAAI 2020, NeurIPS (2019–2022), AISTATS (2019–2022), ICML (2019, 2022).