Bikram Karmakar

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Academic Appointments

July 2025 –	Assistant Professor, Department of Statistics, University of Wisconsin, Madison, USA.
July 2025 –	Courtesy Professor, Department of Statistics, University of Florida, USA.
Aug 2019 – June 2025	Assistant Professor, Department of Statistics, University of Florida, USA.

Research Interests

Causal inference; observational studies; application of statistics to social sciences, public policy and marketing.

Editorial boards

Biometrics, Associate editor (June 2025 –).

Sankhya A, Associate editor (April 2025 –).

Education

2019 Ph.D. in Statistics

School:	The Wharton School, University of Pennsylvania, USA
Advisor:	Prof. Dylan S. Small
Dissertation title:	Evidence factors in observational studies: Design, analysis and computation

2019 M.A. in Statistics

School:	The Wharton School, University of Pennsylvania, USA
Advisor:	Prof. Dylan S. Small
Dissertation title:	Effect of demonetization on digital payments in India: Causal inference in the absence of controls

2013 Master of Statistics, *with distinction*

School:	Indian Statistical Institute, India
Specialization:	Mathematical Statistics and Probability
Advisor:	Prof Nikhil R Pal
Master's thesis title:	How to make a neural network say don't know?

2011 Bachelor in Statistics, *with distinction*
School: Indian Statistical Institute, India
Specialization: Mathematical Statistics and Probability

Pre-print articles (* indicates graduate student)

32. B. Karmakar and B. Pareek. "Leaf nodes of decision trees as balancing score in observational studies with multiple treatments."

31. Z. Qin* and B. Karmakar. (2023). "Causal inference with confounded treatment by calibrating resistant population's variance." https://arxiv.org/pdf/2312.16439.

Journal Articles under Revision in Peer-Review Process(* indicates graduate student)

Peer-Reviewed and Referred Publications(* indicates graduate student)

30. M. Ennes, (2026). The development and validation of a teaching self-efficacy assessment for informal science educators, *Research in Science Education*, to appear.

29. R. Yu†, B. Karmakar†, J. Vandeleest, and E. Bimla Schwarz. (2026) Using a Two-Parameter Sensitivity Analysis Framework to Efficiently Combine Randomized and Non-randomized Studie, https://arxiv.org/abs/2412.03731 *Journal of the Royal Statistical Society - Series B.* († indicates equal contributions)

28. B. Karmakar. (2026) Regression to the mean in regression discontinuity design: Bias and sensitivity analysis. *Journal of Causal Inference*.

27. A. Ghosh*, N. Deb, B. Karmakar, and B. Sen. (2026) Robustness and Efficiency of Rosenbaum's Rank-based Estimator in Randomized Trials: A Design-based Perspective. *Biometrika*.

26. Christensen, D., Shin, Y.S., Wang, J. …, B. Karmakar, S. A. Coombes, M. W. Mosconi & Z. Wang. (2025) Subcortical brain volume variations in autistic individuals across the lifespan. *Molecular Autism*, 16, 46 (2025).

25. C. Doubeni, C. D. Jensen, M. I. Elsaid, W. K. Zhao, H. K. Jones, K. Cannavale, N. Udaltsova, Y. Kweon, B. Karmakar, A. I. Hahn, and A. G. Zauber, (2025). Effect of fecal immunochemical test screening on colorectal cancer mortality risk: Case-cohort analysis. *Gastroenterology*, 169(1), pp.S-1032.

24. Y. Ohnishi*, B. Karmakar and A. Sabbaghi. "Degree of interference: A general framework for causal inference under interference." *Journal of Machine Learning Research, to appear*.

23. S. Bhattacharya and B. Karmakar. (2025). "Discussion of 'Matrix Completion When Missing Is Not at Random and Its Applications in Causal Panel Data Models' by Choi & Yuan." *Journal of the American Statistical Association, to appear*.

22. Y. Ohnishi*, W. Kar and B. Karmakar. (2024). "Inferring causal effect of a digital communication strategy under a latent sequential ignorability assumption and treatment noncompliance." *Journal of the American Statistical Association*, doi:10.1080/01621459.2024.2435655.

21. B. Karmakar, G. Mukherjee and W. Kar. (2024). "Using penalized synthetic controls on truncated data: A case study on effect of marijuana legalization on direct payments to

physicians by opioid manufacturers." *Journal of the American Statistical Association*, doi: 10.1080/01621459.2024.2406583.

20. B. Karmakar, A. G. Zauber, A. I. Hahn, Y. K. Lau, D. A. Corley, C. A. Doubeni and M. M. Joffe. (2024). "Bias due to coarsening of time intervals in the inference for the efficiency of colorectal cancer screening." *International Journal of Epidemiology*, dyae096. doi: 10.1093/ije/dyae096.

19. Y. Lee,, C. Tan, and B. Karmakar. (2024). "Constructing multiple, independent analyses in the regression discontinuity design with multiple cutoffs." *Observational Studies* 10(2), 63–91.

18. B. Karmakar and D. S. Small. (2023). "Constructing independent evidence from regression and instrumental variables with an application to the effect of violent conflict on altruism and risk preference." *Biostatistics & Epidemiology*, Available from: https://doi.org/10.1080/24709360.2022.2109910.

17. B. Karmakar. (2022). "An approximation algorithm for blocking of an experimental design." *Journal of the Royal Statistical Society - Series B*, 84(5), 1726–1750.

16. A. Zhao, Y. Lee, D. S. Small and B. Karmakar†. (2022). "Evidence factors from multiple, possibly invalid, instrumental variables." *The Annals of Statistics*, 50(3), 1266–1296. († indicates the corresponding author).

15. B. Karmakar, P. Liu, G. Mukherjee, H. Che and S. Dutta. (2022). "Improved retention analysis in freemium role-playing games by jointly modeling players' motivation, progression and churn." *Journal of the Royal Statistical Society - Series A*, 185, 102–133.

14. B. Karmakar, D. S. Small, and P. R. Rosenbaum. (2021). "Reinforced designs: Multiple instruments plus control groups as evidence factors in an observational study of the effectiveness of Catholic schools." *Journal of the American Statistical Association*, 116(533), 82–92.

13. B. Karmakar, C. A. Doubeni, and D. S. Small. (2020). "Evidence factors in a case-control study with application to the effect of flexible sigmoidoscopy screening on colorectal cancer." *The Annals of Applied Statistics*, 14, 829–849.

12. B. Karmakar and D. S. Small. (2020). "Assessment of the extent of corroboration of an elaborate theory of a causal hypothesis using partial conjunctions of evidence factors." *The Annals of Statistics*, 48(6), 3283–3311.

11. B. Karmakar, D. S. Small, and P. R. Rosenbaum. (2020). "Using evidence factors to clarify exposure biomarkers." *American Journal of Epidemiology*, 189(3), 243-249.

10. B. Karmakar, B. French, and D. S. Small. (2019). "Integrating the evidence from evidence factors in observational studies." *Biometrika*, 1066, 353–367.

9. B. Karmakar, D. S. Small, and P. R. Rosenbaum. (2019). "Using approximation algorithms to build evidence factors and related designs for observational studies." *Journal of Computational and Graphical Statistics*, 28(3), 698–709.

8. B. Karmakar, S. Das, S. Bhattacharya, R. Sarkar, and I. Mukhopadhyay. (2019). "Tight clustering for large data sets with an application to gene expression data." *Nature, Scientific Reports*, vol. 9, no. 1, 3053.

7. B. Karmakar, R. Heller, and D. S. Small. (2018). "False discovery rate control for effect modification in observational studies." *Electronic Journal of Statistics*, 12(2), 3232–3253.

6. B. Karmakar and N. R. Pal. (2018). "How to make a neural network say "Don't know"?" *Information Sciences*, vol. 430-431, 444–466.

5. B. Karmakar and I. Mukhopadhyay. (2018). "Risk efficient sequential estimation of multivariate random coefficient autoregressive process." *Sequential Analysis*, 38(1), 26–45.

4. B. Karmakar and I. Mukhopadhyay. (2018). "Risk efficient estimation of fully dependent random coefficient autoregressive models of general order." *Communications in Statistics - Theory and Methods*, 47(17), 4242–4253.

3. B. Karmakar, K. Dhara, K. K. Dey, A. Basu, and A. K. Ghosh. (2015). "Tests for statistical significance of a treatment effect in the presence of hidden sub-populations." *Statistical Methods & Applications*. (2015) 24(1), 97–119.

Book Chapters

2. B. Karmakar (2023) "Evidence factors." In: J.R. Zubizarreta, E.A. Stuart, D.S. Small, P.R. Rosenbaum (Eds.), *Handbook of Matching and Weighting Adjustments for Causal Inference*, Chapman and Hall/CRC, pp. 583–609. doi:10.1201/9781003102670-26.

1. B. Karmakar and I. Mukhopadhyay (2016). "An efficient partition-repetition approach in clustering of big data." In: S. Pyne, B.L.S. Prakasa Rao, S.B. Rao (Eds.), *Big data analytics: Methods and applications*, Springer India, New Delhi, 2016, pp. 75–93. doi:10.1007/978-81-322-3628-3 5.

Grants

Current support:

Grant no. R01EB034692 Gong, Kuang (PI) 7/15/2024-4/30/2028
Funder: National Institute of Health **Funding amount:** $1,733,543
Title: Deep Learning Methods for Improving Gallium 68-Based PET Imaging.
Role: Co-Investigator.
NIH RePORTER link: https://reporter.nih.gov/project-details/10979633

Grant no. 1R01AG086493 Wang, Zheng (PI) 6/1/2024-2/28/2029
Funder: National Institute of Health **Funding amount:** $3,350,797
Title: Quantification of the neurocognitive, brain, and plasma biomarkers of dementia in middle-aged autistic adult.
Role: Co-Investigator.
NIH RePORTER link: https://reporter.nih.gov/project-details/10860023

Grant no. R01NS121120 Wang, Zheng (PI) 05/01/2021-04/30/2026
Funder: National Institute of Health/National Institute of Neurological Disorders and Stroke **Funding amount:** $1,874,101
Title: Cerebellar and Basal Ganglia Markers Underlie Neuromotor Impairments in Adults with Autism Spectrum Disorder (ASD).
Role: Co-Investigator- effort .3 calendar months.
NIH RePORTER link: https://reporter.nih.gov/project-details/10619012

Completed grants:

Grant no. DMS-2015250- Karmakar, Bikram (PI) 7/1/2020-6/30/2024
Funder: National Science Foundation **Funding amount:** $147,856.00
Title: Development of Methodologies to Formalize the Informal Rules of Causal Inference from Observational Studies Using Evidence Factors and Modern Optimization.
Additional Research Experiences for Undergraduates (REU) supplemental support.
Role: Solo Principal Investigator.
Link: https://www.nsf.gov/awardsearch/showAward?AWD_ID=2015250

Grant no. 5R01CA213645-05 Doubeni, Chyke (PI) 04/01/2020-03/31/2022
Funder: National Institute of Health/National Cancer Institute **Funding amount:** $599,148.00
Title: Effectiveness of Screening for Colorectal Cancer in Aaverage Risk Adults: Colonoscopy vs FIT.
Role: Co-Investigator (Principal Investigator of UF subaward).
NIH RePORTER link: https://reporter.nih.gov/project-details/9905394

Grant no. R21AG065621-01A1 Wang, Zheng (PI) 09/15/2020-08/31/2022
Funder: National Institute of Health/National Institute on Aging **Funding amount:** $228,750.00
Title: Cerebellar and Basal Ganglia Contributions to Neuromotor Issues in Adults with Autism Spectrum Disorder (ASD).
Role: Co-Investigator- effort .6 calendar months.
NIH RePORTER link: https://reporter.nih.gov/project-details/10056961

Software

Github: https://github.com/bikram12345k includes code to implement the proposed methods in the published papers. Other software packages are listed below.

struncatedP	R package for implementing the smoothed truncated product method. [github.com/bikram12345k]
BlockingAlgo	Implementation of approximation algorithms for blocking of an experimental design. [github.com/bikram12345k]
blockingChallenge	R package for creating blocks or strata of units with similar covariates in each stratum. [CRAN, github.com/bikram12345k]
approxmatch	R package for creating approximately optimal fine balance matching with multiple groups. [CRAN]
evidenceFactors	R package for reporting tools for sensitivity analysis of evidence factors in observational studies. [CRAN]

Teaching Experience

Instructor (at UW-Madison)

STAT311	Introduction to Theory and Methods Fall 2025 of Mathematical Statistics I, Fall 2025.

Instructor (at UF)

STA7934	Modern Methods for Causal Inference (Special topics course for Statistics Ph.D. students), Fall 2023 (enrollment 20).
STA6208	Basic Design and Analysis of Experiments (compulsory course for first year Statistics Ph.D. students), Spring 2022, Spring 2023, Spring 2024.
STA6166	Statistical Methods in Research I, Fall 2021, Fall 2022, Spring 2024.
STA4322	Introduction to Statistical Theory, Spring 2021, Fall 2022, Spring 2023, Fall 2023.
STA6126	Statistical Methods in Social Research I, Fall 2020, Fall 2021.
STA4321/5325	Fundamentals of Probability, Fall 2019, Spring 2020.
STAT111	Introduction to Statistics, Summer 2017 (at UPenn).

Teaching Assistant

(While at the University of Pennsylvania)

STAT475/920	Sample Survey Design, Spring 2018 and Fall 2018.
STAT521	Applied Econometrics II, Spring 2015 and Spring 2016.
STAT613 (MBA)	Regression Analysis for Business, Fall 2015.
STAT111	Introductory Statistics (recitation), Fall 2016 and Spring 2017.

Professional Experience

2014–2019 Teaching Assistant, Department of Statistics, *The Wharton School*.

Address : 400 Jon M. Huntsman Hall
3730 Walnut Street
Philadelphia, PA 19104-6340.
215-898-8222; Fax: 215-898-1280

Duties : Included holding regular office hours; exam review classes; and recitation classes for couple of courses, and grading exams.

2013–2014 Analyst in Algo Analytics group at *Morgan Stanley Advantages Services*.

Address : Bldg. 5, Sector 30, Mind Space, Goregaon (West), Floor 06
Mumbai, India 400090.
+91 22 6641-1584; Fax: +91 22 6641-1011

Duties : Regular duties included updating and maintaining analytics dashboard, and participating and reporting in business meetings. The longer term project was on the performance analysis of, with an aim to significantly improve, the algorithmic hedging tool.

Awards and Fellowships

New Researcher Travel Award, *Institute of Mathematical Statistics*, 2020.

Student Paper Award, Social Statistics, Government Statistics, and Survey Research Methods Sections (SRMS/GSS/SSS), *American Statistical Association*, 2019.

Donald S. Murray Award for excellence in teaching, *The Wharton School*, 2018.

Deming Student Scholar Award, Deming Conference on Applied Statistics, *American Statistical Association*, 2018.

Student Paper Award, Social Statistics, Government Statistics, and Survey Research Methods Sections (SRMS/GSS/SSS), *American Statistical Association*, 2018.

Student travel award, Wharton Doctoral Programs, *George James Term Fund*, 2016, 2017.

Research and teaching fellowship, *The Wharton School, University of Pennsylvania*, 2015–2019.

Poster presentations

Parks, E.M., Qu, H., Christensen, D., Gemmell, H.M., Wetherington, K.E., Orlando, A.M., Romero, R.A., **Karmakar, B.**, Vaillancourt, D.E., & Wang, Z. Atypical visually guided precision grip control and its association with perceived physical health quality in middle-aged and older autistic adults. Poster presentation at Society for Neuroscience (SfN) Neuroscience 2025; Nov 15-19; San Diego.

Qu, H., Terza, M., Gemmell, H. M., Shirley, D. J., Orlando, A.-M., **Karmakar, B.**, & Wang, Z. (2025). Persistent deviations in non-constrained walking and grooved pegboard test performance in middle-aged and older autistic adults. The Annual Meeting of the Society for Neuroscience (SfN 2025). San Diego, CA USA, November 15th – 19th, 2025.

Simpson, J, Wang, J, Terza, M, Palmero, M, Shirley, DJ, McKinney, WS, Orlando, AM, Romero, R, **Karmakar, B**, Mosconi, MW & Wang, Z. Gait variations in autism spectrum disorder across the lifespan. Poster accepted at Society for Neuroscience (SfN) Neuroscience 2023; 2023 Nov 11-15; Washington DC.

Shafer, R. L., Wang, Z., **Karmakar, B.**, & Mosconi, M. W. Visual and proprioceptive feedback mechanisms of fine and gross motor control in ASD. International Meeting for Autism Research (IMFAR) annual conference. (May 2022). Austin, TX.

Wang, Z., Coombes, S.A., Vaillancourt, D.E., Shirley, D.J., Valcante, G., Orlando, A-M., Romero, R.A., **Karmakar, B.**, Wagle Shukla, A. A., Mosconi, M.W. Atypical cortical and subcortical brain activation associated with precision visuomotor control in autistic adults. International Meeting for Autism Research (IMFAR) annual conference. (May 2022). Austin, TX.

Shirley, D.J., Shafer, R.L., McKinney, W.S., **Karmakar, B.**, Mosconi, M.W., Wang, Z. Effects of visual and proprioceptive inputs on postural stability in individuals with autism spectrum disorder (ASD). Society for Neuroscience (SfN) annual conference (November 2021). Chicago, IL.

Wang, Z., Coombes, S.A., Vaillancourt, D.E., Shirley, D.J., Valcante, G., Orlando, A-M., Romero, R.A., **Karmakar, B.**, Wagle Shukla, A. A., Mosconi, M.W. Atypical cortical and subcortical brain activation associated with precision visuomotor control in autistic adults. Society for Neuroscience (SfN) annual conference (November 2021). Chicago, IL.

Invited Talks

– Department of Statistical Science, Duke University, 13 Feb, 2025.
– Department of Statistics, University of Wisconsin-Madison, 5 Feb, 2025.
– Department of Statistics, Florida State University, 12 September, 2025.
– Joint Statistical Meetings 2025, Nashville, USA, 2–6 August, 2025.
– CMStatistics 2023, Berlin, Germany, 16–18 December, 2023.
– Department of Marketing, University of Florida, Gainesville, 22 September, 2023.
– EcoSta 2023, Tokyo, Japan, 1–3, August 2023.
– International Chinese Statistical Association (ICSA) Applied Statistics Symposium 2023, Ann Arbor, Michigan, 11–14 June, 2023.
– International Indian Statistical Association (IISA) 2022 Conference, Bangalore, India, Dec 26–30, 2022.

– INFORMS Annual Meeting, Indianapolis, IN, Oct 16–19, 2022.
– Joint Statistical Meetings, Washington, DC, Aug 6–11, 2022.
– Understanding early adoption of hybrid cars via a new multinomial probit model with multiple spatial weights, Indian Institute of Management, Bangalore, 18th July 2022.
– Brief Introduction to Modern Causal Inference, Indian Institute of Management, Bangalore, 16th July 2022.
– Department of Biostatistics, University of Florida, Gainesville, FL, April 15, 2022.
– Biostatistics Seminar Series, Ohio State University, Columbus, OH, March 11, 2022.
– CMStatistics 2021, King's College London, UK, 18-20 December 2021.
– Statistics Department, Bowling Green State University, Sep 10, 2021.
– ISI World Statistics Conference (ISI WSC) 2021 Conference, July 16, 2021.
– International Indian Statistical Association (IISA) 2021 Conference, May 20, 2021.
– As Discussant in International Seminar on Selective Inference, organized by Rina Barber, Will Fithian, Daniel Yekutieli, and Lihua Lei, 4 March 2021.
– Causal Inference Working Group, Johns Hopkins University, 25 February 2021.
– IEU Seminar, MRC Integrative Epidemiology Unit, University of Bristol, UK, 27 October 2020.
– CMStatistics 2020, King's College London, UK, 19-21 December 2020.
– EcoSta 2020 Yonsei University, Seoul, South Korea, 20-22 July 2020. (Canceled due to covid)
– Annual Meeting of the Statistical Society of Canada. Ottawa, May 31–June 3, 2020. (Canceled due to covid)
– International Indian Statistical Association (IISA) Conference, Dec. 2019, Mumbai, India.
– INFORMS Annual Meeting, Oct. 2019, Seattle, WA.
– Department of Biostatistics, Penn State University, Hershey, PA, 15 Mar 2019.
– Statistics Group, Data Sciences and Operations, USC Marshall, LA, Jan 2019.
– Statistics Department, University of North Carolina, Chapel-Hill, Jan 2019.
– Department of Biostatistics, Yale University, Jan 2018, New Haven, CT.
– Department of Statistics, University of Florida, Dec 2018, Gainesville, FL.

Advising

Undergraduate students:

– Hannah J Fechtel (Senior thesis advisor, UF, graduated Fall 2021), now researcher at Norman Fixel Institute for Neurological Diseases.
– Samuel Michael Thomas (Research mentor, Senior thesis advisor, UF, graduated Spring 2023), now data scientist at IBM.
– Ali Hussain (Senior thesis advisor, UF, graduated Fall 2022).

Graduate students:

– Zikun Qin (Research supervisor, Statistics Department, UF, Fall 2020–ongoing).
– Jaewoong Joo (Ph.D. co-adviser, ongoing).
– Animesh Mitra (Ph.D. co-adviser, ongoing).

Fulbright Fellow:

– Jana Furstova (Ongoing, previously at Olomouc University Social Health Institute (OUSHI), Czech Republic).

Professional Services

Reviewer:

Journals: *American Journal of Agricultural Economics, Annals of Applied Statistics, Biometrical Journal, Biometrics, Electronic Journal of Statistics, IEEE Journal of Cybernetics, Journal of the American Statistical Association, Journal of the Royal Statistical Society–Series B, Journal of Causal Inference, Journal of Computational and Graphical Statistics, Journal of Machine Learning Research, Lifetime Data Analysis, Operations Research, Observational Studies, PLOS Genetics, Sankhyā A, Stat, Statistical Science, Statistica Sinica, etc.*

Books: *Chapman & Hall/CRC Press (3).*

Academic community:

– Publication Officer of the Statistics in Epidemiology section of the American Statistical Association (2022 –).

– Co-organizer, Winter Workshop 2024 on Causal inference and its applications at UF (19-20 January, 2024).

– Faculty adviser, Indian Graduate Student Association, UF (2020 – 2025).

Internal service:

– Co-organizer, Mark C. K. Yang event on the collaboration of UF Statistics and Biostatistics department (27 October, 2023).

– Organizer, UF statistics department seminar series (Fall 2021, Spring 2022).

– Lecturer search committee, UF statistics department (2021); led to two hires.

– **Thesis committee:** David Lindberg (Doctoral, Department of Statistics, UF, now Lecturer at UF), Xiran Fan (Doctoral, Department of Statistics, UF, currently a Research Scientist with Visa, CA), Zikun Qin (Doctoral, Department of Statistics, UF, graduated spring 2024, now Data Scientist at Google), Jhonti Chakraborty (Doctoral, Department of Chemistry, UF, graduated spring, 2023, now postdoctoral researcher at the University of California, Riverside), Wei Hsieh (Masters, Statistics Department, UF, graduated 2020), Manan Singh (Doctoral, College of Design Construction and Planning, UF, ongoing, now at the Pacific Northwest National Laboratory), Jaeyoung Park (Doctoral, Industrial and Systems Engineering, UF, graduated 2022, now principal researcher at the University of Chicago Booth School of Business), Yang Li (Doctoral, Department of Statistics, UF, ongoing), Lei Yang (Doctoral, Department of Statistics, UF, ongoing), Yue Xu (Doctoral Student, Research and Evaluation Methodology, UF).