October 12, 2023

CURRICULUM VITAE

Abhirup Datta

PROFESSIONAL DATA

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Twitter: @dattascience

EDUCATION AND TRAINING

Degree	Year	Institution
PhD, Biostatistics	2016	University of Minnesota, Twin Cities, MN
MStat	2010	Indian Statistical Institute, Kolkata, India
(Specialization in Math-Stat-Probability)		
BStat (with Honors)	2008	Indian Statistical Institute, Kolkata, India,

PROFESSIONAL EXPERIENCE

Johns Hopkins University

- 2022 – present: Associate Professor, Department of Biostatistics, Johns Hopkins University.
- 2016 – 2021: Assistant Professor, Department of Biostatistics, Johns Hopkins University.
- 2017 – present: Affiliate Faculty, The Spatial Science for Public Health Center, Johns Hopkins University.

Other Non-JHU Professional Experience

- 2010 – 2012: Quantitative analyst, Morgan Stanley.

HONORS AND AWARDS

Research awards:

- (2023) Abdel El-Shaarawi Early Investigator's Award, The International Environmetrics Society (TIES). This award is given annually to an researcher within 12 years of completion of their PhD for their statistical contributions to Environmental Sciences.
- (2021) Young Statistical Scientist Award (YSSA), International Indian Statistical Association (IISA). This annual award recognizes most outstanding contributions in Applications and Statistical Practice by a person under 44 years.
- (2021) Early Investigator Award (EIA), American Statistical Association Section on Statistics and the Environment (ENVR). This annual award recognizes outstanding contributions to environmental statistics in the first 12 years after obtaining terminal degree.
- (2018) Honorable mention (Finalist): Savage Award (Applied Methodology), International Society for Bayesian Analysis (ISBA).
- (2017) ASA Outstanding Statistical Application Award, American Statistical Association.
- (2016) ENAR Distinguished Student Paper Award, International Biometric Society, Austin, TX.
- (2016) Delta Omega Honorary Society Student Inductee (Pi Chapter), Minneapolis, MN.
- (2014) JSM Student Paper Award, American Statistical Association, Section on Bayesian Statistical Science, Boston, MA. Also selected for best paper award in Statistics and the Environment Section
- (2014) Best Paper Award, Division of Biostatistics, University of Minnesota, Minneapolis, MN.
- (2016) Best Student Seminar Presentation Award, Division of Biostatistics, University of Minnesota, Minneapolis, MN.
- (2015) Inter-disciplinary Doctoral Fellowship 2015-16, Division of Biostatistics, University of Minnesota Graduate School, Minneapolis, MN.

Teaching, Advising, and Mentoring awards:

- (2020) JHU AMTRA Award (Advising, Mentoring, & Teaching Recognition) by JHSPH Student Assembly for 2019-2020.
- Excellence in Teaching awards, Johns Hopkins Bloomberg School of Public Health,

  (1) (2023, Term 4) Probability Theory IV

  (2) (2023, Term 3) Probability Theory III

  (3) (2022) Probability Theory IV

  (4) (2021) Probability Theory IV

  (5) (2018) Probability Theory IV

- (2014) Outstanding Teaching Assistant Award, Division of Biostatistics, University of Minnesota, Minneapolis, MN.

Grant awards as Principal Investigator :

- (2022-2026) National Institute of Environmental Health Sciences (NIEHS) R01 award (USD 1.3M) for *"Statistical methods for air-pollution studies using low-cost monitors"*

- (2021-2024) Bill & Melinda Gates Foundation award (USD 1.1M) for *"Broadening the applicability of minimally-invasive-tissue-sampling (MITS)-based verbal autopsy (VA) calibration to improve global mortality estimates"*
- (2019-2023) National Science Foundation (NSF) Division of Mathematical Sciences (DMS) award (USD 180K) for *"Highly multivariate geo-statistics using graphical models"*
- (2018-2019) Bloomberg American Health Initiative Spark award (USD 71K) for *"Statistical Maps of Air Quality in Baltimore City Using Low-Cost Monitoring Data"*

Peer review awards:

- (2018) Top 1% of reviewers in Mathematics, Publons.
- (2017) Top 1% of reviewers in Mathematics, Publons.

PUBLICATIONS *The white numbers in black boxes indicates manuscripts where Dr. Datta is the first author or senior/corresponding author; * indicates a mentored student or post-doctoral fellow of Dr. Datta; † indicates equal contributions.*

Statistical Methods

1 *Heffernan C, Peng RD, Gentner D, Koehler K, **Datta, A** (2023) A dynamic spatial filtering approach to mitigate underestimation bias in field calibrated low-cost sensor air-pollution data *Annals of Applied Statistics (Accepted)*

- Student paper award for C. Heffernan at the EnviBayes 2023 conference of the International Society for Bayesian Analysis (ISBA).

2 *Saha A, Basu S, **Datta A** (2023) Random forests for spatially dependent data *Journal of the American Statistical Association Theory and Methods 118.541 (2023): 665-683.*

3 Wang G, **Datta A**, Lindquist M (2023) Improved fMRI-based Pain Prediction using Bayesian Group-wise Functional Registration *Biostatistics (Accepted)* ArXiV

4 Rosenblum, M, Chin, ET, Ogburn, EL, Nishimura, A, Westreich, D, **Datta, A**, Vanderplas, S, Cuellar, M and Thompson, WC (2023) Misuse of Statistical Method Results in Highly Biased Interpretation of Forensic Evidence in Guyll et al. *Law., Probability, and Risk (Accepted pending revisions)*

5 *Dey D, **Datta A**, Banerjee S (2023) Modeling Multivariate Spatial Dependencies Using Graphical Models *New England Journal of Statistics and Data Science (Accepted)*

6 **Datta A.** (2023) Invited Discussion of "Saving Storage in Climate Ensembles: A Model-Based Stochastic Approach" *Journal of Agricultural Biological and Environmental Statistics 28.2 (2023): 352-357.*

7 *Dey D, **Datta A**, Banerjee S (2022) Graphical Gaussian Processes for highly multivariate spatial data *Biometrika, 109(4), 993-1014.*

- American Statistical Association Section on Bayesian Statistics (SBSS) student paper award for D. Dey at the Joint Statistical Meetings (2021).

8 Wikle CK, **Datta A**, Hari BV, Boone EL, Sahoo I, Kavila I, Castruccio S, Simmons SJ, Burr WS, Chang W (2022) An Illustration of Model Agnostic Explainability Methods Applied to Environmental Data *Environmetrics, 34(1), e2772.*

9 *Fiksel J, **Datta A**, Amouzou A, Zeger S. (2022) Generalized Bayes Quantification Learning under Dataset Shift *Journal of the American Statistical Association Theory and Methods, 117(540), 2163-2181.*

10 *Saha A, **Datta A**, Banerjee S Scalable Predictions for Spatial Probit Linear Mixed Models Using Nearest Neighbor Gaussian Processes *Journal of Data Science, 20(4), 533-544,*

11 *Saha A, Basu S, and **Datta A.**, (2022). RandomForestsGLS: An R package for Random Forests for dependent data *Journal of Open Source Software, 7(70), 3780*

12 Gao L., **Datta A**, Banerjee S (2022) Hierarchical Multivariate Directed Acyclic Graph Auto-Regressive (MDAGAR) Models for Spatial Diseases Mapping *Statistics in Medicine, 41(16): 3057–3075*

13 Finley AO, **Datta A**, Banerjee S. (2022) spNNGP R package for Nearest Neighbor Gaussian Process models *Journal of Statistical Software, 103(1), 1–40.*

14 *Fiksel J, Zeger S, **Datta A** (2021) A Transformation-free Linear Regression for Compositional Outcomes and Predictors *Biometrics, 78, 974– 987.*

15 **Datta A** (2021) Sparse nearest-neighbor Cholesky matrices in spatial statistics *Wiley Interdisciplinary Reviews: Computational Statistics, e1574.*

16 Wang G, **Datta A**, Lindquist M (2021) Bayesian Functional Registration of fMRI Data *Annals of Applied Statistics, , 16(3), 1676-1699.*

17 **Datta A**, *Pita, A, Rao, A, Sithole, B, Mnisi, Z, and Baral, S. (2020) Size Estimation of Key Populations in the HIV Epidemic in eSwatini using incomplete and misaligned capture-recapture data *Annals of Applied Statistics, 14(3), 1207–1241*

18 **Datta A**, *Fiksel J, Amouzou A, Zeger S. (2020) Regularized Bayesian transfer learning for population level etiological distributions *Biostatistics, ISSN 1465–4644*

19 **Datta A**, Zou H. (2019) A note on cross-validation for Lasso under measurement errors *Technometrics, 62(4), 549–556*

20 **Datta A**, Banerjee S, Hodges JS., Gao, L. (2019) Spatial disease mapping using Directed Acyclic Graph Auto-Regressive (DAGAR) models *Bayesian Analysis 14(4), 1221–1244*

21 Gao, L., **Datta A**, Banerjee S, (2020) Spatial Modeling for Correlated Cancers Using Bivariate Directed Graphs *Annals of Cancer Epidemiology 4, ISSN 2616-4213*

22 Taylor-Rodriguez D, Finley AO, **Datta A**, Babcock C, Andersen H, Cook BD, Morton DC, Banerjee S. (2019) Spatial Factor Models for High-Dimensional, Large Spatial Data: An Application in Forest Variable Mapping *Statistica Sinica 26(29) 1155–1180*

23 Zhang L, **Datta A**, Banerjee S. (2019) Practical Bayesian Inference for Massive Spatial Data on Modest Computing Environments *Statistical Analysis and Data Mining: The ASA Data Science Journal 12.3:197-209.*

24 Finley AO, **Datta A**, Cook BC, Morton DC, Andersen HE, Banerjee S. (2019) Efficient algorithms for Bayesian Nearest Neighbor Gaussian Processes *Journal of Computational and Graphical Statistics 28.2 (2019): 401-414.*

25 Heaton MJ, **Datta A**, Finley AO, Furrer R, Guhaniyogi R, Gerber F, Gramacy RB, Hammerling D, Katzfuss M, Lindgren F, Nychka DW, Sun F, Zammit-Mangion A. (2019) A Case Study Competition Among Methods for Analyzing Large Spatial Data *Journal of Agricultural, Biological and Environmental Statistics 24(3) 398–425.*

- Best Paper award for 2018-2019 in the Journal of Agricultural, Biological and Environmental Statistics by the International Biometric Society

26 **Datta A**, Lin W, Rao A, Diouf D, Kouame A, Edwards JK, Bao L, Louis TA, Baral SB (2019) Bayesian estimation of MSM population in Côte d'Ivoire *Statistics and Public Policy 6(1), 1-13.*

27 **Datta A**, Zou H, Banerjee S. (2019) Bayesian high-dimensional regression for change point analysis *Statistics and Its Interface 12(2), 253-264.*

28 *Saha A, **Datta A.** (2018) BRISC: Bootstrap for rapid inference on spatial covariances *Stat e184*

- American Statistical Association Section on Statistical Computing Student paper award for A. Saha at Joint Statistical Meetings, 2018.
- One of two papers selected for 'Highlights of the Stat journal' session at International Statistical Institute World Congress, 2019.

29 **Datta A**, Zou H. (2017) CoCoLasso for High-dimensional Error-in-variables Regression *Annals of Statistics 45(6): 2400-2426*

30 **Datta A**, Banerjee S, Finley AO, Hamm NAS, Schaap M. (2016) Non-separable Dynamic Nearest Neighbor Gaussian Process Models for Large Spatio-temporal Data with Application to Particulate Matter Analysis *Annals of Applied Statistics 10(3): 1286-1316*

- American Statistical Association Outstanding Statistical Application award (2017).
- Eastern North American Region (ENAR) distinguished student paper award for A. Datta (2016).

31 **Datta A**, Banerjee S, Finley AO, Gelfand AE. (2016) On nearest-neighbor Gaussian process models for massive spatial data *Wiley Interdisciplinary Reviews: Computational Statistics 8(5) 162-171*

32 **Datta A**, Banerjee S, Finley AO, Gelfand AE. (2016) Hierarchical Nearest Neighbor Gaussian Process models for Large Geostatistical Datasets *Journal of the American Statistical Association Theory and Methods 111(514) 800-812*

- One of top 5 most cited papers in the Journal of the American Statistical Association between 2016-2020.
- American Statistical Association Section on Bayesian Statistics (SBSS) student paper award for A. Datta at the Joint Statistical Meetings (2014).

Scientific Applications

33 *Fiksel J, *Gilbert B, Wilson E, Kalter H, Kante A, Akum A, Blau D, Bassat Q, Macicame I, Gudo E, Black R, Zeger S, Amouzou A, **Datta A** (2023) Correcting for verbal autopsy misclassification bias in cause-specific mortality estimates *American Journal of Tropical Medicine and Hygiene 108.5 Suppl: 66.*

34 Weber L, *Saha A, **Datta A**, Hansen K, Hicks S (2023) nnSVG: scalable identification of spatially variable genes using nearest-neighbor Gaussian processes *Nature Communications 14.1: 4059.*

35 Wilks M, Green T, Rule AM, Zamora ML, Buehler C, **Datta A**, Gentner DR, Putcha N, Hansel NN, Kirk GD, Raju S, McCormack M, Koehler K (2023) Evaluation of Calibration Approaches for Indoor Deployments of PurpleAir Monitors *Atmospheric Environment 119944.*

36 *Gilbert B, *Fiksel J, Wilson E, Kalter H, Kante A, Akum A, Blau D, Bassat Q, Macicame I, Gudo E, Black R, Zeger S, Amouzou A, **Datta A** (2023) Multi-cause calibration of verbal autopsy-based cause-specific mortality estimates of children and neonates in Mozambique *American Journal of Tropical Medicine and Hygiene 108.5 Suppl: 78.*

37 Levy-Zamora M, Buehler C, **Datta, A**, Gentner D, Koehler K (2023) Identifying optimal co-location calibration periods for low-cost sensors *Atmospheric Measurement Techniques 16.1: 169-179.*

38 Lin J, Buehler C, **Datta A**, Gentner D, Koehler K, Levy-Zamora M (2023) Laboratory and Field Evaluation of a Low-cost Methane Sensor and Key Environmental Factors for Sensor Calibration *Environmental Science: Atmospheres 3.4: 683-694.*

39 Ivalda M, Almamy K, Wilson E, *Gilbert B, Nhachungue S, Monjane C, Adriano A, Chicumbe S, Jani, l, Kalter H, **Datta A**, Zeger S, Black R, Samo G, Amouzou A (2023) Countrywide Mortality Surveillance for Action – COMSA - in Mozambique: Results from a national sample vital registration system for mortality and cause of death *American Journal of Tropical Medicine and Hygiene 108.5 Suppl: 5.*

40 Seal S, **Datta A**, Basu S (2022) Efficient Estimation of SNP Heritability using Gaussian Predictive Process in Large scale Cohort Studies *PLOS Genetics, 18(4): e1010151.*

41 Patton AN, **Datta A**, Levy-Zamora M, Buehler C, Xiong F, Gentner D, Koehler K (2022) Non-linear probabilistic calibration of low-cost environmental air pollution sensor networks for neighborhood level spatiotemporal exposure assessment *Journal of Exposure Science and Environmental Epidemiology 32.6: 908-916.*

42 Zamora ML, Buehler C, Lei H, **Datta A**, Xiong F, Gentner D, Koehler, K (2022) Evaluating the performance of using low-cost sensors to calibrate for cross-sensitivities in a multipollutant network *Environmental Science and Technology Engineering 2.5: 780-793.*

43 Butler EE, Wythers KR, Flores-Moreno, H, Ricciuto DM, **Datta A**, Banerjee A, Atkin OK, Kattge J, Thorton PE, Madhur A, Burrascano S, Byun C, Cornelissen JHC, Forey E, Jansen S, Kramer K, Minden V, and Reich PB (2022) Increasing functional diversity in a global land surface model illustrates uncertainties related to parameter simplification *Journal of Geophysical Research - Biogeosciences 127.3 (2022): e2021JG006606.*

44 Butler EE, Wythers KR, Flores-Moreno, H, Chen M, **Datta A**, Ricciuto DE, Atkin OK, Kattge J, Thorton PM, Banerjee A, Reich PB (2021) Updated respiration routines alter spatio-temporal patterns of carbon cycling in a global land surface model *Environmental Research Letters 16(10) p. 104015.*

45 **Datta, A,** *Saha, A, Levy-Zamora, M, Buehler, Colby, Hao, L, Xiong, F, Gentner DR, Koehler K (2020) Statistical field calibration of a low-cost PM2.5 monitoring network in Baltimore *Atmospheric Environment 242, 117761, ISSN 1352-2310*

46 Flores-Moreno H, Fazayeli F, Banerjee A, **Datta A**, Kattge J, Butler EE, Atkin O, Wythers K, Chen M, Anand M, Bahn M, Burrascano S, Byun C, Cornelissen J, Craine J, Gonzalez-Melo A, Hattingh W, Jansen S, Kraft N, Kramer K, Laughlin D, Minden V, Niinemets U, Onipchenko V, Penuelas J, Soudzilovskaia N, Reich PB. (2019) Robustness of trait connections between multiple plant organs across environmental gradients, growth forms *Global Ecology and Biogeography 28(12), 1806–1826*

47 Edwards JK, Hileman S, Donastorg Y, Sanchez R, Zadrozny S, Baral SB, Hargreaves J, Fearon E, Zhao J, **Datta A**, Weir SS. (2018) Estimating sizes of key populations at the national level: considerations for study design, analysis *Epidemiology 29(6): 795–803*

48 † Butler EE, † **Datta A.** / ··· 48 authors ··· / Reich, PB. (2017) Mapping local and global variability in plant trait distributions *Proceedings of the National Academy of Sciences 114(51): E10937–E10946*

Manuscripts Submitted

49 * Heffernan C, Koehler K, Levy-Zamora M, Buehler C, Gentner D, Peng RD, **Datta, A** A machine learning based interrupted time series framework for studying causal changes in air pollution due to policy interventions: A case study in COVID-19 lockdowns (Revision Invited)

- American Statistical Association Section on Statistics and the Environment student paper award for C. Heffernan at the Joint Statistical Meetings (2023)

50 *Zhan W, **Datta A** Neural networks for geospatial data (Revision Invited) ArXiV

51 Tang B, Zhao Y, Caffo B, **Datta A** Direct Bayesian Regression for Distribution-valued Covariates (Revision Invited) ArXiV

52 *Gilbert B, **Datta A** Visibility graph-based covariance functions for scalable spatial analysis in non-convex domains (Revision Invited) ArXiV

53 Bonas M, **Datta** A, Wikle CK, Boone EL, Alamri FS, Hari BV, Kavila I, Simmons SJ, Jarvis SM, Burr WS, Pagendam D, Chang W, Castruccio S Assessing Predictability of Environmental Processes with Statistical and Machine Learning Models (Revision Invited)

54 *Gilbert B, Ogburn EL, **Datta A** Consistency of common spatial estimators under spatial confounding ArXiV

55 *Gilbert B, **Datta A**, Casey JA, Ogburn EL A causal inference framework for spatial confounding ArXiV

56 *Dey D, **Datta A**, Banerjee S Graph-constrained Analysis for Multivariate Functional Data using Graphical Gaussian Processes ArXiV

57 *Saha A, **Datta A** Random forests for binary geospatial data ArXiV

58 Zhao Y, **Datta A**, Tang B, Zipunnikov V, Caffo B Density-on-Density Regression ArXiV

Published Open-access Software

1 **BRISC (2018) (**34253 **CRAN downloads as of Aug, 2023)**
BRISC is an R-package on CRAN for rapid estimation, prediction and inference for large spatial data in a frequentist setup. BRISC estimation and prediction relies on nearest neighbor approximations of the spatial Gaussian Process likelihood, and uses a scalable paramteric bootstrap to provide inference for all spatial parameters. To our knowledge, currently BRISC is the only R-package that provides confidence intervals in a frequentist setup for all parameters including the spatial variance and range of Gaussian Process. Inference from BRISC is highly competitive with those obtained on Bayesian approaches relying on MCMC, while being manifold times faster.

2 **spNNGP (2017) (**26846 **CRAN downloads as of Aug, 2023)**
spNNGP is an R package on CRAN for fully Bayesian analysis of massive spatial data. Spatial analysis of point process data is usually computationally expensive requiring memory and computations that are quadratic and cubic in the number of locations where data is observed. spNNGP implements a class of scalable Nearest Neighbor Gaussian Process models that uses memory and computations that are linear in the size of the data. spNNGP enables fast fully Bayesian inference of all parameters and proper uncertainty quantified predictions at new locations. An MCMC-free hybrid Bayesian conjugate NNGP is also included which is super fast even for spatial datasets with millions of locations. The new version of spNNGP also has the option to run Bayesian spatial GLM for binary spatial data using Nearest Neighbor Gaussian Processes.

3 **codalm (2020) (**18792 **CRAN downloads as of Aug, 2023)**
codalm is an R-package for linear modeling of compositional data (coda). It implements a simple transformation-free regression of a compositional outcome on a compositional prediction using an M-estimation method. Estimates of the regression-coefficient matrix, bootstrap-based confidence intervals are provided. A permutation based test of linear association is also offered.

4 **RandomForestsGLS (2021) (**16618 **CRAN downloads as of Aug, 2023)**
RandomForestsGLS is an R-package for fitting non-linear regression models on dependent data (spatial and temporal) with Generalised Least Square (GLS) based Random Forests (RF-GLS) detailed in Saha, Basu and Datta (2020). For spatial data, 'RandomForestsGLS' combines the strengths of Random Forest and Gaussian Process to estimate and predict non-linear functions using nearest neighbor Gaussian Process. For time-series data, 'RandomForestsGLS' uses the AR (auto-regressive) process covariance structure with Random Forests for estimation.

5 **calibratedVA (2018) (Github download stats not available)**
calibatedVA is an R-package on Github for local calibration of national and sub-national cause specific mortality (CSMF) estimates produced by algortihms based on verbal autopsy data. These computer coded verbal autopsy (CCVA) algorithms usually rely on non-local gold standard training data and can be inaccurate in a local context. calibratedVA uses the output of the CCVA algorithm and limited amount of local gold standard data to update the CSMF estimates using a fast Bayesian hierarchical model. calibratedVA also has an ensemble calibration option where outputs from multiple CCVA algorithms are used to produce an unified calibrated CSMF estimate. the package can also be used in other general contexts to calibrate any discrete classifier (or a set of classifiers) based on limited local labeled data.

MENTORING

PhD Advisees

Current:

1 Heffernan, Claire, Doctor of Philosophy, Biostatistics (2019 – present)

2 Zhang, Wentao, Doctor of Philosophy, Biostatistics (2020 – present, co-advised with Hongkai Ji)

3 Song, Jiafang, Doctor of Philosophy, Biostatistics (2021 – present)

4 Anik Burman, Doctor of Philosophy, Biostatistics (2022 – present)

Graduated:

5 Gilbert, Brian, Doctor of Philosophy, Biostatistics (2019 – 2023, co-advised with Betsy Ogburn).

- Currently Postdoctoral fellow at the New York University (NYU)

6 Dey, Debangan, Doctor of Philosophy, Biostatistics (2017 – 2022, co-advised with Vadim Zipunnikov)

- Currently Postdoctoral fellow at the National Institute of Mental Health (NIMH)

7 Saha, Arkajyoti, Doctor of Philosophy, Biostatistics (2016 – 2021, co-advised with Nilanjan Chatterjee).

- Currently Postdoctoral fellow at the Department of Statistics at University of Washington

8 Fiksel, Jacob, Doctor of Philosophy, Biostatistics (2015 – 2020).

- Currently at Vertex Pharmaceuticals, Boston, MA

ScM Advisees

1 Lin, Yi-Ting, Master of Science, Biostatistics (2022 – 2023)

2 Xiang, Chen, Master of Science, Biostatistics (2020 – 2021)

3 Pita, Andrew, Master of Science, Biostatistics (2017 – 2019)

Post-doctoral fellows

1 Dr. Sandipan Pramanik (2022 -)

2 Bora Jin (August, 2023 -)

JHU Diversity Summer Internship Program (DSIP) Mentorship

1 Thomas, Bella, Intern (Summer 2023)

2 Griffin, Karen, Intern (Summer 2022)

Other mentored students

1 Dr. Bohao Tang (PhD, 2023, Biostatistics, advisor: Brian Caffo)

2 Dr. Guoqing Wang (PhD, 2022, Biostatistics, advisor: Martin Lindquist)

3 Wenyi Lin (ScM, 2017, Biostatistics, advisor: Scott Zeger)

TEACHING

Classroom Instruction - Principal Instructor (JHSPH)

- 2018-2023, 140.724 Probability Theory IV (4^{th} term).
- 2023, 140.724 Probability Theory III (3^{rd} term).
- 2021, 140.850 Advanced Spatial Statistics (3^{rd} term).
- 2019, Biostatistics PhD seminar (3^{rd} term).
- 2018, 140.850 Advanced spatial statistics (3^{rd} term).
- 2017, 140.850 Scalable methods for large spatial data (4^{th} term).

Short Course

- Full day short course on Bayesian models for high dimensional spatial data, Joint Statistical Meetings (2017).

Classroom Instruction - Invited Guest Lecturer (JHSPH)

- 140.860.01 Current Topics in Biostatistics (2021)
- 140.651.01 Methods in Biostatistics I (2019)
- 340.680.01 Environmental and Occupational Epidemiology (2018).

Teaching Assistant

Division of Biostatistics, University of Minnesota

- Advanced Statistical Inference, Instructors: Dr. Cavan Reilly and Dr. David Vock, Spring 2015
- Probability Models for Biostatistics, Instructor: Dr. Baolin Wu, Fall 2014
- Bayes Decision Theory and Data Analysis, Instructor: Dr. Sudipto Banerjee, Spring 2014
- Advanced Statistical Inference, Instructors: Dr. Julian Wolfson and Dr. David Vock, Spring 2014
- Probability Models for Biostatistics, Instructor: Dr. Baolin Wu, Fall 2013
- Advanced Regression, Instructor: John Hughes, Ph.D, Spring 2012
- Statistical Methods for Correlated Data, Instructor: Dr. Julian Wolfson, Fall 2012

ACADEMIC SERVICE

Scientific Advisory Committees

2023 - Pathology-informed Reference Death Archive for the World Health Organization

Program Leadership

2023 - Program chair-elect 2024 for the American Statistical Association Section on the Statistics and the Environment

Editorial Boards

2020 - Journal of Computation and Graphical Statistics
2022 - Biometrics
2022 - Sankhya (Series B)
2023 - Journal of the Royal Statistical Society Series A
2023 - Journal of the Royal Statistical Society Series B

Peer Review Activities

1. Advances in Statistical Climatology Meteorology and Oceanography
2. American Journal of Epidemiology (AJE)
3. Artificial Intelligence and Statistics Conference 2021 (AISTATS 2021)
4. Annals of Statistics
5. Annals of Applied Statistics
6. Bayesian Analysis
7. Biometrics
8. Biometrika
9. Biostatistics
10. Brazilian Journal of Probability and Statistics
11. Canadian Journal of Statistics
12. Computational Statistics and Data Analysis (CSDA)
13. Electronic Journal of Statistics
14. Environmental Health Policy (EHP)

15. Environmental Science and Technology (ES&T)
16. Environmetrics
17. Harvard Data Science Review
18. IEEE Transactions on Pattern Analysis and Machine Intelligence
19. Journal of Agricultural Biological and Environmental Statistics (JABES)
20. Journal of the American Statistical Association Applications and Case Studies (JASA-ACS)
21. Journal of the American Statistical Association Theory and Methods (JASA-TM)
22. Journal of Computation and Graphical Statistics (JCGS)
23. Journal of Multivariate Analysis (JMVA)
24. Journal of the Royal Statistical Society Series B (JRSSB)
25. Journal of the Royal Statistical Society Series C (JRSSC)
26. New England Journal of Statistics and Data Science (NEJSDS)
27. Sankhya A
28. Scientific Reports
29. Spatial Statistics
30. Statistica Sinica
31. Statistics and Computing
32. Statistics in Medicine

Johns Hopkins Bloomberg School of Public Health

- Elected member of the Faculty Senate (2021 – 2023)

Department of Biostatistics, Johns Hopkins University

- Honors and Awards committee (2021 – present)
- Co-leader of the Bayesian Learning and Spatio-temporal (BLAST) modeling working group, (2020 – present)
- Graduate students admissions committee (2019 - present)
- Curriculum committee, Biostatistics Retreat (2018)
- Co-leader of the Spatial Statistics and Small area estimation (SAESS) working group, (2016 – 2018)
- Faculty Recruitment Committee (2017)
- Organizer, Biostatistics departmental seminars (2017)

External Letters of support for Promotion or Tenure

George Mason University

Grant Review Panels

- (2023) Faculty Innovation Fund Panel, Johns Hopkins Bloomberg School of Public Health
- (2020) National Science Foundation (NSF) Division of Mathematical Sciences (DMS)

Program Development

- 2023 Eastern North American Region (ENAR) conference Program Committee
- Ad-hoc committee of the International Society for Bayesian Analysis (ISBA) for early career awards (2021)
- Scientific Program Committee for the International Indian Statistical Association conference (IISA) (2021).
- Session Organizer, Joint Statistical Meetings (2022).
- Session Organizer, Joint Statistical Meetings (2019).
- Session Organizer, Joint Statistical Meetings (2018).

- Student paper award reviewer, Section on Bayesian Statistical Science, Joint Statistical Meetings (2021).
- Student poster competition judge, International Indian Statistical Association (IISA) INDSTAT conference (2019).
- Student paper award reviewer, Section on Bayesian Statistical Science, Joint Statistical Meetings (2019).
- Student paper award reviewer, Section on Bayesian Statistical Science, Joint Statistical Meetings (2018).

- Session chair for EcoSTA conference (2023).
- Session chair for International Indian Statistical Association conference (IISA) (2022).
- Session chair for Statistical Data Science Workshop (2022).
- Session Chair, SRCOS Conference (2022)
- Session Chair, Joint Statistical Meetings (2022).
- Session Chair, Joint Statistical Meetings (2020).
- Session Chair, International Indian Statistical Association (IISA) INDSTAT conference (2019).
- Session Chair, Joint Statistical Meetings (2019).
- Session Chair, Joint Statistical Meetings (2014).

Professional Memberships

- American Statistical Association
- International Biometric Society (Eastern North American Region (ENAR))
- International Indian Statistical Association (IISA)
- The International Environmetric Society (TIES) of the International Statistical Institute (ISI)
- International Society for Bayesian Analysis (ISBA)

RESEARCH GRANT PARTICIPATION

Bold titles and square bullet points are grants funded as a Principal or Co-Principal Investigator.

Ongoing Research Support

- **Statistical methods for air-pollution studies using low-cost monitors National Institute of Environmental Health Sciences**
  (NIEHS R01)
  Dates: February 2022 to November 2026.
  Principal Investigators: Abhirup Datta.
  Award amount: $1,326,376.00
  Responsibility: Principal Investigator.

- **Broadening the applicability of minimally-invasive-tissue-sampling (MITS)-based verbal autopsy (VA) calibration to improve global mortality estimates**
  (Bill & Melinda Gates Foundation)
  Dates: December 2021 to April 2024.
  Principal Investigators: Abhirup Datta.
  Award amount: $1,099,940.00
  Responsibility: Principal Investigator.

- *Study of HIV Infection in the Etiology of Lung Disease (SHIELD) (NHLBI R01)*
  Dates: Jul 2022 to Mar 2026.
  Principal Investigator: Meredith McCormack.
  Responsibility: Co-investigator.

- *Newborn, Child, and Adolescent Epidemiology Estimation (NCAEE) (Bill & Melinda Gates Foundation)*
  Dates: Apr 2022 to Mar 2025.
  Principal Investigator: Li Liu.
  Responsibility: Co-investigator.

- *Center for Community Health: Addressing Regional Maryland Environmental Determinants of Disease (NIEHS P30)*
  Dates: Aug 2020 to Jul 2025.
  Principal Investigator: Marsha Wills-Karp.
  Responsibility: Co-investigator.

- *Cholera Burden and Transmission Modeling II (Bill & Melinda Gates Foundation)*
  Dates: Nov 2022 to Sep 2025.
  Principal Investigator: Justin Lessler.
  Responsibility: Co-investigator.

- *Personalized spatiotemporal hemodynamic response models for functional magnetic resonance imaging (NIH R01)*
  Dates: Sep 2022 to Aug 2027.
  Principal Investigator: Martin Lindquist.
  Responsibility: Co-investigator.

- *Comprehensive Mortality Surveillance for Action (COMSA)- Mozambique (Bill & Melinda Gates Foundation)*

Dates: Jan 2017 to Dec 2023.
Principal Investigator: Agbessi Amouzou.
Responsibility: Co-investigator.

Completed Research Support

■ **Highly multivariate geo-statistics using graphical models**
(NSF DMS-1915803)
Dates: July 2019 to June 2023.
Principal Investigators: Abhirup Datta.
Award amount: $180,000
Responsibility: Principal Investigator.

- *Cholera Burden and Transmission Modeling (Bill & Melinda Gates Foundation)*
Dates: Sep 2019 to Jul 2023.
Principal Investigator: Justin Lessler.
Responsibility: Co-investigator.

- *Individualized spatial topology in functional neuroimaging (NIBIB R01)*
Dates: July 2018 to Mar 2022.
Principal Investigator: Martin Lindquist.
Responsibility: Co-investigator.

- *The SEARCH Center: Solutions for Energy, AiR, Climate, and Health (Environmental Protection Agency)*
Dates: Sep 2020 to Aug 2021.
Principal Investigator: Kirsten Koehler and Drew Gentner.
Responsibility: Co-investigator.

■ **Air Pollution and COPD Hospitalizations in Baltimore in the Context of COVID-19**
(Alliance for a Healthier World COVID-19 Launchpad Grant)
Dates: June 2020 to May 2021.
Principal Investigators: Kirsten Koehler and Abhirup Datta.
Responsibility: Co-Principal Investigator.

■ **Improved Heritability Estimation by Spatial Mapping of Genetic Relationships**
(NIH R21))
Dates: July 2018 to Jun 2020.
Principal Investigator: Saonli Basu.
Responsibility: Principal investigator on sub-contract.

■ **Statistical Maps of Air Quality in Baltimore City Using Low-Cost Monitoring Data**
(Bloomberg American Health Initiative Spark Award)
Dates: July 2018 to June 2019.
Principal Investigators: Abhirup Datta and Kirsten Koehler.
Award amount: $71,000
Responsibility: Principal Investigator.

- *Project SOAR – Supporting Operational AIDS Research (USAID SH142)*
Dates: Oct 2016 to Mar 2019.

Principal Investigator: Deanna Kerrigan.
Responsibility: Statistical Consultant.

Scientific Communication

PLENARY TALK

1 July 2023 The International Environmetrics Society Meeting, Peterborough, Canada

INVITED PANELS

2 2023 - Panelist in Bridging the Gap: Exploring the Role of AI in the Climate and Health Intersection, Johns Hopkins India Institute, Washington DC

3 2023 - Panelist in American Statistical Association Graduate Student Mentoring Session at the Joint Statistical Meetings 2023, Toronto, CA

4 2020 - Panelist in Faculty workshop on Mentoring PhD students, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

INVITED PRESENTATIONS

5 Nov 2023 (scheduled) The International Environmetrics Society Webinar Series on Interdisciplinary applications of statistics and Machine Learning for environmental applications

6 Nov 2023 (scheduled) Department of Statistics, Federal University of Minas Gerais (UFMG), Sao Paulo, Brazil (virtual)

7 Oct 2023 (scheduled) Department of Biostatistics, Yale University, New Haven, CT

8 Oct 2023 (scheduled) Department of Statistics, Cornell University, Ithaca, NY

9 Oct 2023 MITS Surveillance Alliance Annual Meeting, Nairobi, Kenya

10 Sep 2023 EnviBayes workshop, Fort Collins CO

11 Sep 2023 Department of Biostatistics, University of Utah, Salt Lake City, UT

12 Sep 2023 Department of Statistics, Brigham Young University, Provo, UT

13 Sep 2023 (scheduled) Department of Statistics, Virginia Tech University, Blacksburg, VA

14 Jul 2023 EcoSTAT Conference, Tokyo, Japan (virtual)

15 Jun 2023, International Chinese Statistical Association Conference, Ann Arbor, MI

16 Jun 2023 SIAM Conference on Optimization, Seattle, WA

17 Jun 2023 The Bill and Melinda Gates Foundation, Seattle, WA

18 May 2023 Center for Statistics and the Social Sciences, University of Washington, Seattle, WA

19 May 2023, Statistics, Computer Science, and Mathematics Department, The Public University of Navarre, Pamplona, Spain

20 May 2023, BIRS workshop on Machine Learning and Spatial Extremes, Granada, Spain

Dec 2022 International Indian Statistical Association Conference, Bengaluru, India.

Dec 2022, CMStat conference, Kings College, London, UK

Oct 2022, Data Science Conference, Texas A&M University, College Station, TX

Oct 2022, Southern Regional Council on Statistics (SRCOS) Conference, Jekyll Island, GA

Sep 2022, Department of Population, Family and Reproductive Health, Johns Hopkins University, Baltimore, MD

Aug 2022, Statistical Data Science Workshop, University of Bologna, Italy

Aug 2022 Joint Statistical Meetings, Washington DC.

Jul 2022, International Biometrics Conference (IBC2022)

May 2022 North-Eastern Statistics Symposium (NESS) (virtual)

Mar 2022 Eastern North American Region Meetings (ENAR), International Biometric Society, Houston, TX

Feb 2022, Department of Biostatistics, McGill University, Montreal, CA

Nov 2021 East Asia Chapter of the International Society for Bayesian Analysis (EAC ISBA) (virtual)

Oct 2021, Department of Statistics, Purdue University, West Lafayette, IA

Sep 2021, Department of Biostatistics, University of Minnesota, Twin Cities

Aug 2021 Joint Statistical Meetings, Seattle, WA

May 2021 Center for Disease Control (CDC) Division of Global HIV and TB's Key Population Surveillance Team (virtual)

Apr 2021 IHME-CHAMPS Convening (virtual)

Apr 2021 Department of Biostatistics, NYU School of Global Public Health, New York City, NY

Apr 2021 MCEE Cause of Death (COD) Misclassification Methods Meeting (virtual).

Mar 2021 SIAM Conference on Computational Science and Engineering (virtual)

Oct 2020, Department of Statistics, Iowa State University, Ames, IA

Oct 2020, Department of Biostatistics, Virginia Commonwealth University, Richmond, VA

Sep 2020, RTI International, Raleigh, NC

Sep 2020 MITS Surveillance Alliance Meeting (virtual)

Aug 2020 Joint Statistical Meetings (virtual)

Mar 2020 Eastern North American Region Meetings (ENAR), International Biometric Society (virtual)

Dec 2020 International Indian Statistical Association Conference, Mumbai, India.

Sept 2019, Department of Statistics, Penn State University, State College, PA

49 Aug 2019 International Statistical Institute World Congress, Kuala lampur, Malaysia.

50 Aug 2019 Joint Statistical Meetings, Denver, CO.

51 May 2019, LRI Causes and Etiologies Meeting, Baltimore, MD.

52 # Mar 2019 SEARCH Scientific Advisory Committee meeting, Yale University, New Haven, CT.

53 Mar 2019, Child Health and Mortality Prevention Surveillance (CHAMPS) program, Emory University, Atlanta, GA.

54 Feb 2019, Department of Biostatistics, UCLA, Los Angeles, CA

55 Jan 2019 Interdisciplinary Statistical Research Unit, Indian Statistical Institute, Kolkata, India.

56 Aug 2018 Joint Statistical Meetings, Vancouver, Canada.

57 Jun 2018 ISBA World Meeting, Edinburgh, UK.

58 Jun 2018, MITS Surveillance Alliance Inaugural Meeting, Barcelona, Spain

59 Mar 2018 Eastern North American Region Meetings (ENAR), International Biometric Society, Atlanta, GA.

60 Dec 2017 International Indian Statistical Association Conference, Hyderabad, India.

61 Dec 2017 10th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, UK.

62 Nov 2017 American Public Health Association Annual Meeting, Atlanta, GA.

63 Oct 2017 UNAIDS Reference Group Fall Meeting 16-18 October 2017, London, UK.

64 Feb 2017 CDC Consultation Conference on Key Populations, CDC, Atlanta, GA.

65 Feb 2017 Department of Mathematics and Statistics, University of Maryland , Baltimore County, MD.

66 Nov 2016 President's Emergency Plan for Aids Relief, Washington DC.

67 Feb 2016 Department of Statistical Science, Duke University, Durham, NC.

68 Feb 2016 Department of Biostatistics, University of Michigan, Ann Arbor, MI.

69 Feb 2016 Department of Biostatistics, Johns Hopkins University, Baltimore, MD.

70 Feb 2016 Department of Statistics, University of California, Irvine, CA.

71 Feb 2016 Department of Biostatistics, University of North Carolina, Chapel Hill, NC.

72 Dec 2016 Platinum Jubilee International Conference on Applications of Statistics, Calcutta University, Kolkata, India.