

Anirban Bhattacharya

CONTACT INFORMATION	Department of Statistics Texas A&M University 401D Blocker 3143 TAMU College Station, TX 77843-3143	Voice: (979) 845-3141 Fax: (979) 845-3144 E-mail: anirbanb@stat.tamu.edu www.stat.tamu.edu/~anirbanb Google Scholar Profile
RESEARCH INTERESTS	Bayesian nonparametrics, contingency tables, covariance estimation, factor models, Gaussian process regression, high-dimensional data, MCMC algorithms, network data, shrinkage priors, tensor decompositions, variable selection	
PROFESSIONAL EXPERIENCE	Associate Professor, Department of Statistics, Texas A&M University, College Station, Texas, USA from September 2018 Assistant Professor, Department of Statistics, Texas A&M University, College Station, Texas, USA August 2013 - August 2018 Postdoctoral Associate, Department of Statistical Science, Duke University, Durham, North Carolina, USA June 2012 to July 2013 <ul style="list-style-type: none">• Postdoctoral supervisor: Professor David B. Dunson	
EDUCATION	Duke University , Durham, North Carolina, USA Ph.D., Statistics (May, 2012), Department of Statistical Science <ul style="list-style-type: none">• Thesis Topic: Semiparametric Bayes latent factor models• Advisor: Professor David B. Dunson Indian Statistical Institute , Kolkata, West Bengal, India Master of Statistics, June 2008 <ul style="list-style-type: none">• First Division with Distinction• Specialization: Mathematical Statistics and Probability Bachelor of Statistics, June 2006 <ul style="list-style-type: none">• First Division with Distinction	
AWARDS	<ul style="list-style-type: none">• <i>Noether Young Scholar Award (2018)</i>, American Statistical Association• <i>NSF CAREER Award (2017)</i>, Division of Mathematical Sciences, National Science Foundation• <i>Leonard J. Savage Dissertation Award (Theory and Methods) 2012</i>, ISBA, ASA-SBSS• <i>Student paper award</i>: Section of Bayesian Statistical Science (SBSS), 2011• <i>Travel award: from NSF</i>, 8th Workshop on Bayesian Nonparametrics (BNP), 2011• <i>Travel award: from NIH</i>, International Society for Bayesian Analysis (ISBA), 2010• <i>Mahalanobis International Symposium on Statistics Award (2008)</i>, Indian Statistical Institute, Kolkata	

GRANTS

- ONR BAA 14-001 (PI), 06/01/14 - 05/31/17, Bayesian inference for high-dimensional covariance matrices and tensors.
- College of Science Strategic Transformative Research Program, Texas A&M University (PI). 09/01/2017 - 08/31/2018. Addressing a Bias in the Relations Between Galaxies and Their Central Black Holes.
- NSF PD 08-1269 (PI), 7/1/16-6/30/19. Collaborative proposal: Scalable Bayesian methods for complex data with optimality guarantees.
- NIH PA-13-302 (Co-I; PI: Valen Johnson), 1/1/2017 - 12/31/2021. Consistent variable selection in $p \gg n$ settings.
- NSF 15-555 (CAREER), 06/01/2017-05/31/2022. Bayesian generalized shrinkage: an encompassing model approach.
- DHHS-NIH-National Cancer Institute (co-I; PI: Raymond Carroll), 08/01/2017 - 08/31/2021. Training grant on Nutrition, Biostatistics and Bioinformatics.
- NSF DMS-1854731 (co-PI; PI: Debdeep Pati), 06.15.2019 - 05.31.2022. Enhanced Statistical Learning for Physical Systems Exploiting Non-Standard Constraints.

LIST OF PUBLICATIONS

1. **Bhattacharya, A.** and Dunson, D.B. (2011). Sparse Bayesian infinite factor models. *Biometrika* 98(2): 291-306.
2. Dzirasa, K., Mcgrarity, D., **Bhattacharya, A.** et al. (2011). Impaired limbic gamma oscillatory synchrony during anxiety related behavior in a genetic mouse model of bipolar mania, *Journal of NeuroScience* 31(17): 6449-6456.
3. **Bhattacharya, A.** and Dunson, D.B. (2012). Simplex factor models for multivariate unordered categorical data, *Journal of the American Statistical Association*, 107: 362-377.
4. **Bhattacharya, A.**, Pati, D. and Dunson, D.B. (2014). Anisotropic function estimation using multi-bandwidth Gaussian processes, *The Annals of Statistics*, 42(1):352-381 arXiv:1111.1044v4
5. Pati, D., **Bhattacharya, A.**, Pillai, N.S. and Dunson, D.B. (2014). Posterior contraction in sparse Bayesian factor models for massive covariance matrices, *The Annals of Statistics* 42(3):1102-1130. arXiv:1206.3627v3
6. **Bhattacharya, A.**, Pati, D., Pillai, N.S. and Dunson, D.B. (2014). Dirichlet-Laplace priors for optimal shrinkage, *Journal of the American Statistical Association* 110(512):1479-1490 arXiv:1401.5398
7. Zhou, J., **Bhattacharya, A.**, Herring, A. and Dunson, D.B. (2015). Bayesian factorizations of big sparse tensors, *Journal of the American Statistical Association* 110(512):1562-1576 arXiv:1306.1598
8. Pati, D., **Bhattacharya, A.**, Cheng, G. (2015). Optimal Bayesian estimation in random covariate design with a rescaled Gaussian process prior. *Journal of Machine Learning Research* 16:2837-2851 arXiv:1411.7420
9. Katzfuss, M. and **Bhattacharya, A.** (2015). Comment on Article by Dawid and Mussio. *Bayesian Anal.* 10(2): 501-504.

10. Pati, D. and **Bhattacharya, A.** (2015). Adaptive Bayesian estimation in Gaussian sequence model using exponential-variance priors. *Statistics and Probability letters* 103:100–104.
11. Zhou, J., Herring, A., **Bhattacharya, A.**, Olshan, A., Dunson, D.B. and the National Birth Defects Prevention Study (2016). Nonparametric Bayes modeling for case control studies with many predictors. *Biometrics* 72(1):184–192.
12. **Bhattacharya, A.**, Chakraborty, A., Mallick, B. (2016). Fast sampling with Gaussian scale-mixture priors in high-dimensional regression. *Biometrika* 103 (4): 985–991. arXiv:1502.02336
13. Johndrow, J., **Bhattacharya, A.**, Dunson, D.B. (2017). Tensor decompositions and sparse log-linear models. *The Annals of Statistics*, 45(1): 1– 38 arXiv:1404.0396
14. **Bhattacharya, A.** and Pati, D. (2018). Posterior contraction in Gaussian process regression using Wasserstein approximations. *Information and Inference*, 6(4): 416–440. arXiv:1502.02336
15. Shin, M., **Bhattacharya, A.**, Johnson, V. (2018). Scalable Bayesian Variable Selection Using Nonlocal Prior Densities in Ultrahigh-Dimensional Settings. *Statistica Sinica*, 28(2):1053-1079 arXiv:1507:07106
16. Johndrow, J. and **Bhattacharya, A.**(2018), Optimal Gaussian approximations to the posterior for log-linear models with Diaconis–Ylvisaker priors. *Bayesian Analysis*, 13(1): 201-223 arXiv:1511.00764
17. **Bhattacharya, A.**, Dunson, D.B., Pati, D., Pillai, N.S. (2017) Sub-optimality of some continuous shrinkage priors. *Stochastic Processes and Their Applications* 126(12): 3828-3842.
18. Pati, D., **Bhattacharya, A.**, Yang, Y. (2018). Statistical properties of Variational Bayes. AISTATS.
19. Geng, G., **Bhattacharya, A.**, Pati, D. (2019). Probabilistic community detection with unknown number of communities. *Journal of the American Statistical Association*, 114 (526):893-905.
20. Wang, F., **Bhattacharya, A.**, Gelfand, A.E. (2018). Process modeling for slope and aspect with application to elevation data maps. *TEST* 27(4), 749–772.
21. **Bhattacharya, A.**, Pati, D., Yang, Y. (2019). Bayesian fractional posteriors. *The Annals of Statistics* 47(1): 39-66.
22. Shin, M., **Bhattacharya, A.**, Johnson, V.E. (2019+). Functional horseshoe priors for subspace shrinkage. *Journal of the American Statistical Association*, *Accepted for publication*.
23. Sabnis, G., Pati. D., **Bhattacharya, A.** (2018). Compressed covariance estimation with automated dimension learning. *Sankhya, Series A*, <https://doi.org/10.1007/s13171-018-0134-x>
24. Yang, Y., Pati, D., **Bhattacharya, A.** (2019). α -variational Bayes and its statistical properties. *The Annals of Statistics*, *Accepted for Publication*.
25. Chakraborty, A., **Bhattacharya, A.**, Mallick, B.(2019). Bayesian sparse multiple regression for simultaneous rank reduction and variable selection. *Biometrika*, *Accepted for Publication*.

26. Hseih, P., Liu, X., **Bhattacharya, A.**, Kumar, P.R. (2019). Stay With Me: Lifetime Maximization Through Heteroscedastic Linear Bandits With Reneging. *ICML*
27. Zhou, S., Giulani, P., Piekarewicz, J., **Bhattacharya, A.**, Pati, D. (2019). Reexamining the proton-radius problem using constrained Gaussian processes. *Phys. Rev. C 99, 055202*.
28. Maity, A. K., **Bhattacharya, A.**, Mallick, B.K., Baladandayuthapani, V. (2019). Bayesian Data Integration and Variable Selection for Pan-Cancer Survival Prediction using Protein Expression Data. *Biometrics, Accepted for Publication*.
29. Ghosh, P., Pati, D., **Bhattacharya, A.** (2019). Posterior contraction rates for stochastic block models. *Sankhya, Accepted for Publication*.

MANUSCRIPTS
UNDER REVISION

1. Zhou, S., Pati, D., **Bhattacharya, A.** and Dunson, D.B. (2019). Posterior convergence rates in non-linear latent variable models.
2. Zhang, X. and **Bhattacharya, A.** (2019+). Empirical Bayes, SURE and sparse normal mean models.
3. Yang, Y., **Bhattacharya, A.**, Pati, D. (2019). Frequentist coverage and sup-norm convergence rate in Gaussian process regression.
4. Su, Y., **Bhattacharya, A.**, Zhang, Y., Chatterjee, N., Carroll, R.J. (2018). Non-parametric Bayesian Deconvolution of a Symmetric Unimodal Density, with Application to Genomics.
5. Johndow, J., Orenstein, P., **Bhattacharya, A.** (2019). Scalable MCMC for Bayes shrinkage priors.
6. Souris, A., **Bhattacharya, A.**, Pati, D. (2018). The soft multivariate truncated normal distribution.
7. Ray, P., Pati, D., **Bhattacharya, A.** (2019). Efficient Bayesian shape-restricted function estimation with constrained Gaussian process priors.
8. Acharyya, S., Zhang, Z., **Bhattacharya, A.**, Pati, D. (2019). Bayesian Hierarchical Modeling on Covariance Valued Data
9. Pramanik, S., Johnson, V.E., **Bhattacharya, A.** (2019). Higher significance with smaller samples: A Modified Sequential Probability Ratio Test.

TEACHING
EXPERIENCE

Texas A&M University, College Station, Texas, USA

Fall 2013: Instructor: (Statistical Methods) STAT 302.

Spring 2014: Instructor: (Statistical Methods) STAT 302.

Fall 2014: Instructor: (Distribution Theory) STAT 610.

Spring 2015: Instructor: (Statistical Methods) STAT 302.

Fall 2015: Instructor: (Distribution Theory) STAT 610.

Fall 2015: Instructor: (Statistical Aspects of Machine Learning-part I) STAT 616.

Spring 2016: Instructor: (Bayesian modeling and inference) STAT 632.
Fall 2016: Instructor: (Distribution Theory) STAT 610.
Fall 2016: Instructor: (Statistical Aspects of Machine Learning-part I) STAT 616.
Spring 2017: Instructor: (Bayesian modeling and inference) STAT 632.
Fall 2017: Instructor: (Statistical Aspects of Machine Learning-part I) STAT 616.
Spring 2018: Instructor: (Bayesian modeling and inference) STAT 632.
Fall 2018: Instructor: (Statistical Aspects of Machine Learning-part I) STAT 616.

DOCTORAL
ADVISEES

Minsuk Shin (2013 – 2017), Texas A&M University, co-advised with Dr. Valen Johnson. Postdoctoral Fellow at Department of Statistics, Harvard University
Antik Chakraborty (2013 – 2018), Texas A&M University, co-advised with Dr. Bani Mallick. Postdoctoral Fellow at Department of Statistics, Duke University.
Satwik Acharya, Texas A&M University, (2016 – present), co-advised with Dr. Deb-deep Pati
Allyson Souris, Texas A&M University, (2016 – present)
Pallavi Ray, Texas A&M University, (2017 – present)

DOCTORAL
DISSERTATION
COMMITTEE

Abhra Sarkar, PhD, Texas A&M University (Statistics), (graduated 2014)
Jingnan Xue, Texas A&M University (Statistics), (2014 – present)
Amir Nikooienejad, Texas A&M University (Statistics), (2015 – present)
Richard Payne, Texas A&M University (Statistics), (2016 – present)
Yabo Niu, Texas A&M University (Statistics), (2016 – present)
Zhenfeng Lin, Texas A&M University (Statistics), (2016 – present)
Riddhi Pratim Ghosh, Department of Statistics, Texas A&M University (2016 – present)
Christopher M. Manuel, Department of Statistics, Texas A&M University (2016 – present)
Alex Lapanowski, Department of Statistics, Texas A&M University (2017 – present)
Biraj Guha, Department of Statistics, Texas A&M University (2018 – present)
Jianing Zhang, PhD, Texas A&M University (ATMO)
Jose Preciado Arreola, PhD, Texas A&M University (ISEN)
Mahmood Ettehad, Texas A&M University (Mathematics), (2015 – present)
Priyadharshini Sundararajan Venkatas, Texas A&M University (ECEN), (2015 – present)
Alireza Karbalayghareh, Texas A&M University (ECEN), (2016 – present)
Todd Schrader, MS, Texas A&M University (Mathematics)
Zheming Gao, MS, Texas A&M University (Mathematics)
Xinjie Fan, Texas A&M University (MS in Mathematics)

INVITED TALKS

- Cornell day of Statistics 2018 (In honor of Dr. Ed George). Department of Statistical Science, Cornell University. Ithaca, NY (September, 2018).
- SLDS 2018. Columbia University, NY (June, 2018).
- IISA (Indian International Statistical Association) 2018. Gainesville, Florida (May, 2018)
- International Workshop on Objective Bayes Methodology (O-Bayes 17). Austin, Texas (December, 2017)
- BNP workshop at BIRS in Oaxaca, Mexico. (December, 2017)
- Department of Statistics Colloquium Series, Michigan State University, USA. (November, 2017)
- Workshop on “Data-Driven Model Reduction, Scientific Frontiers, and Applications”, Institute For Scientific Computation, Texas A&M University, College Station, USA (April, 2017)
- Department of Statistics Colloquium Series, University of Michigan, Ann Arbor, USA (February, 2017)
- Bio Group Seminar, Department of Electrical & Computer Engineering, Texas A&M University, College Station, USA (February, 2017)
- Platinum Jubilee International Conference on Applications of Statistics, Department of Statistics, University of Calcutta, India (December, 2016)
- Joint Statistical Meetings (JSM), Chicago, USA (August 2016)
- 3rd Conference of the International Society for Non-Parametric Statistics (ISNPS) Avignon, France (June, 2016)
- Structured Multivariate data workshop, TAMU, College Station, TX, USA (January, 2016)
- IASC-ARS 2015, Singapore (December, 2015)
- IISA (Indian International Statistical Association) 2015 conference, Pune, India (December, 2015)
- 10th Conference on Bayesian Nonparametrics (BNP), Raleigh, NC, USA (June, 2015)
- Bayesian Nonparametrics: Synergies between Statistics, Probability and Mathematics (BNP-SSPM), SAMSI, NC, USA (June, 2015)
- ISBA World Meetings, Cancun, Mexico (July 2014)
- ASC-IMS conference, Sydney, Australia (July 2014)
- ISBIS/SLDM conference, Durham, NC, USA (June 2014)
- Department of Statistics Colloquium Series, Florida State University, Tallahassee, Florida (April 2014)
- IAMCS Machine learning seminar series, Department of Statistics, Texas A & M University, College Station, TX, USA (April 2014)

- Joint Statistical Meetings, Montreal, Canada (August, 2013)
- Harvard University (February, 2013)
- University of Pennsylvania, Wharton School (February, 2013)
- University of Purdue (February, 2013)
- University of California, Davis (February, 2013)
- University of Florida (January, 2013)
- Texas A&M University (January, 2013)
- ISBA regional meeting (IWCBTA), Varanasi, India (January, 2013)
- 8th Workshop on Bayesian Nonparametrics, Veracruz, Mexico (June, 2011)
- IISA conference on Probability, Statistics and Data analysis, NC State University, Raleigh (April 2011)
- ERCIM, London (December 2010)

CONTRIBUTED
TALKS & POSTERS

- Simplex factor models for multivariate unordered categorical data, Joint Statistical Meetings, Miami Beach, Florida (August, 2011)
- Variable selection with Bayesian factor models, *poster presentation*, Semiparametric Bayesian Inference in PKPD Analysis, SAMSI (July 2010)
- Sparse Bayesian infinite factor models, *contributed talk*, International Society for Bayesian Analysis (ISBA) World Meetings, Benidorm, Spain (June 2010)
- Sparse Bayesian infinite factor models, *contributed talk*, ENAR International Biometric Society Spring Meeting in New Orleans, LA (March 2010)
- Bayesian local mixtures of factor analyzers, *poster presentation*, 7th workshop on Bayesian nonparametrics, Moncalieri, Italy (June 2009)
- Nonparametric measures of Inequality, *contributed talk*, International Conference on Multivariate Statistical Methods- In the legacy of Prof. S.N. Roy. Kolkata, India (December 2007)

PROFESSIONAL
ACTIVITY

- Associate Editor for Statistics and Probability Letters (2015 –)
- Associate Editor for Sankhya (2016 –)
- *Served as reviewer for* Annals of Statistics, Annals of Applied Statistics, Annals of the Institute of Statistical Mathematics, Bayesian Analysis, Biometrika, Bernoulli, Electronic Journal of Statistics, Journal of the American Statistical Association, Journal of Machine Learning Research, Journal of Multivariate Analysis, Journal of Statistical Planning and Inference, Machine learning, Technometrics
- Invited reviewer for AISTAT and ICML.
- Session chair, Joint Statistical Meetings 2013
- Session organizer, ISBIS/SLDM 2014

- Session chair, ISBA 2014 World Meetings
- Session organizer, ERCIM 2015
- Co-organizer of "Structured Multivariate Data" workshop at TAMU statistics (January, 2016)
- Session chair, JSM 2016, Chicago, USA
- Scientific Committee Member of 11th Conference on Bayesian nonparametrics, Paris, France (June 2017)
- Discussant in NSF-DMS panel (February 2017)