

ANINDYA BHADRA

CONTACT INFORMATION	Department of Statistics Purdue University 250 N. University St. West Lafayette, IN 47907-2066.	<i>Phone:</i> (765) 496-9551 <i>Fax:</i> (765) 494-0558 <i>E-mail:</i> bhadra@purdue.edu <i>Web:</i> http://www.stat.purdue.edu/~bhadra
RESEARCH INTERESTS	Bayesian methods for high-dimensional and complex data; computational statistics; applications of statistics in the life sciences (genomics, infectious disease epidemiology and nutrition).	
ACADEMIC EMPLOYMENT	<ul style="list-style-type: none">• Associate Professor, Statistics, Purdue University, August 2018 – present.• Assistant Professor, Statistics, Purdue University, August 2012 – August, 2018.	
EDUCATION & TRAINING	<ul style="list-style-type: none">• Postdoctoral Fellow, Statistics, Texas A&M University, September 2010 – July, 2012.• Ph.D., Statistics, University of Michigan, Ann Arbor, August 2010.• M. A., Statistics, University of Michigan, Ann Arbor, April 2007.• Bachelor of Technology (Honors), Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur, May 2004.	
AWARDS AND HONORS	<ul style="list-style-type: none">• Excellence in Research/Seed for Success Award, Purdue University, 2017.• Outstanding Assistant Professor Undergraduate Teaching Award, Purdue University Department of Statistics, 2016.• Elected Member, International Statistical Institute, 2015.• New Researcher Fellow, Statistical and Applied Mathematical Sciences Institute (SAMSI), Fall 2014.	
PUBLICATIONS	Methodological Publications: * equal contribution ^g graduate student collaborator <ol style="list-style-type: none">1. Bhadra, A., Rao, A. and Baladandayuthapani, V. (2018). Inferring network structure in non-normal and mixed discrete-continuous genomic data. <i>Biometrics</i> 74, 185–195.2. Bhadra, A. (2017). An expectation-maximization scheme for measurement error models. <i>Statistics and Probability Letters</i> 120, 61–68.3. Bhadra, A., Datta, J., Polson, N. G. and Willard, B. (2017). The horseshoe+ estimator of ultra-sparse signals. <i>Bayesian Analysis</i> 12, 1105–1131.4. Bhadra, A., Datta, J., Polson, N. G. and Willard, B. (2016). Default Bayesian analysis with global-local shrinkage priors. <i>Biometrika</i> 103, 955–969.5. Bhadra, A. and Carroll, R. J. (2016). Exact sampling of the unobserved covariates in Bayesian spline models for measurement error problems. <i>Statistics and Computing</i> 26, 827–840.	

6. **Bhadra, A.** and Ionides, E. L. (2016). Adaptive particle allocation in iterated sequential Monte Carlo via approximating meta-models. *Statistics and Computing* **26**, 393–407.
7. Feldman, G.^g, **Bhadra, A.** and Kirshner, S. (2014). Bayesian feature selection in high-dimensional regression in presence of correlated noise. *Stat* **3**, 258–272.
8. **Bhadra, A.** and Baladandayuthapani, V. (2013). Integrative sparse Bayesian analysis of multi-platform genomic data in glioblastoma. *2013 IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS 2013)*, pp. 1–4.
9. **Bhadra, A.** and Mallick, B. K. (2013). Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis. *Biometrics* **69**, 447–457. (**Highlights, June 2013 issue**)
10. **Bhadra, A.**, Ionides, E. L., Laneri, K., Pascual, M., Bouma, M. and Dhiman, R. C. (2011). Malaria in Northwest India: Data analysis via partially observed stochastic differential equation models driven by Lévy noise. *Journal of the American Statistical Association* **106**, 440–451. (**Featured article, JASA Applications & Case Studies, June 2011 issue**)
11. Ionides, E. L., **Bhadra, A.**, Atchadé, Y. and King, A. A. (2011). Iterated filtering. *Annals of Statistics* **39**, 1776–1802.
12. **Bhadra, A.** (2011). Invited discussion of “Riemann manifold Langevin and Hamiltonian Monte Carlo methods” by M. Girolami and B. Calderhead. *Journal of the Royal Statistical Society, Series B* **73**, 173–174.
13. Laneri, K.*, **Bhadra, A.***, Ionides, E. L., Bouma, M., Dhiman, R. C., Yadav, R. S. and Pascual, M. (2010). Forcing versus feedback: Epidemic malaria and monsoon rains in Northwest India. *PLoS Computational Biology* **6**, e1000898. (**Cover article, September 2010 issue**)
14. **Bhadra, A.** (2010). Contributed discussion of “Particle Markov chain Monte Carlo methods” by C. Andrieu, A. Doucet and R. Holenstein. *Journal of the Royal Statistical Society, Series B* **72**, 314–315.

Applied Publications:

1. Bailey, R. L., Dodd, K. W., Gahche, J. J., Dwyer, J. T., Cowan, A. E., Jun, S., Eicher-Miller, H. A., Guether, P. M., **Bhadra, A.**, Thomas, P. R., Potischman, N., Carroll, R. J., Tooze, J. A. (2018). Best Practices for Dietary Supplement Assessment and Estimation of Total Usual Nutrient Intakes in Population-Level Research and Monitoring. *Journal of Nutrition (to appear)*.
2. Jun, S., Cowan, A. E., Tooze, J. A., Gahche, J. J., Dwyer, J. T., Eicher-Miller, H. A., **Bhadra, A.**, Guenther, P. M., Potischman, N., Dodd, K. W. and Bailey, R. L. (2018). Dietary Supplement Use among U.S. Children by Family Income, Food Security Level, and Nutrition Assistance Program Participation Status in 2011–2014. *Nutrients (Special Issue on Advances in Dietary Supplements)* **10**, 1212.
3. Cowan, A. E., Jun, S., Gahche, J. J., Tooze, J. A., Dwyer, J. T., Eicher-Miller, H. A., **Bhadra, A.**, Guenther, P. M., Potischman, N., Dodd, K. W. and Bailey, R. L. (2018). Dietary Supplement Use Differs by Socioeconomic and Health-Related Characteristics among U.S. Adults, NHANES 2011–2014. *Nutrients (Special Issue on Advances in Dietary Supplements)* **10**, 1114.

Selected Preprints:

1. **Bhadra, A.**, Datta, J., Polson, N. G. and Willard, B. (2018+). Lasso meets horseshoe. (*under revision*). [[arXiv:1706.10179](#)]
2. Li, Y.^g, Craig, B. A. and **Bhadra, A.** (2018+). The graphical horseshoe estimator for inverse covariance matrices. (*under revision*). [[arXiv:1707.06661](#)]
3. **Bhadra, A.**, Datta, J., Li, Y.^g, Polson, N. G. and Willard, B. (2018+). Prediction risk for the horseshoe regression. (*submitted*). [[arXiv:1605.04796](#)]
4. **Bhadra, A.**, Datta, J., Polson, N. G. and Willard, B. (2018+). Horseshoe regularization for feature subset selection. (*submitted*). [[arXiv:1702.07400](#)]
5. **Bhadra, A.**, Datta, J., Polson, N. G. and Willard, B. (2018+). Global-local mixtures. (*submitted*). [[arXiv:1604.07487](#)]

EXTERNAL GRANTS

- “DMS-1613063: Bayesian global-local shrinkage in high dimensions,” National Science Foundation (NSF), 2016–2019. Role: PI.
- “R01CA215834: Development of a total nutrient index,” National Cancer Institute (NCI), 2017–2021. Role: Co-I.
- “R21CA224764: Temporal dietary and physical activity patterns related to health outcomes,” National Cancer Institute (NCI), 2018–2020. Role: Co-I.

TEACHING

- STAT 355: Statistics for Data Science (Spring 2018; Fall 2018).
- STAT 417: Statistical Theory (Spring 2017, 2016; Fall 2015).
- STAT 546: Computational Statistics (Spring 2016, 2015, 2014).
- STAT 503: Statistical Methods for Biology (Spring 2015, 2014, 2013; Fall 2017; 2016, 2012).

INVITED PRESENTATIONS

Department Seminars:

1. **Default Bayes and prediction problems with global-local shrinkage priors** - Department of Bioinformatics and Biostatistics, University of Louisville, Louisville, KY, September, 2017.
2. **Default Bayes and prediction problems with global-local shrinkage priors** - Department of Applied and Computational Mathematics and Statistics, University of Notre Dame, Notre Dame, IN, February, 2017.
3. **Default Bayes and prediction problems with global-local shrinkage priors** - Department of Statistics and Probability, Michigan State University, East Lansing, MI, November, 2016.
4. **Default Bayes and prediction problems with global-local shrinkage priors** - Department of Statistics, University of Missouri, Columbia, MO, November, 2016.
5. **Default Bayes and prediction problems with global-local shrinkage priors** - Department of Biostatistics, Indiana University School of Medicine, Indianapolis, IN, November, 2016.
6. **The horseshoe+ estimator of sparse signals** - Department of Statistics, Northwestern University, Evanston, IL, January, 2015.

7. **The horseshoe+ estimator of sparse signals** - Department of Statistics, Iowa State University, Ames, IA, November, 2014.
8. **High-dimensional joint Bayesian variable and covariance selection: Applications in eQTL analysis and cancer genomics** - Department of Statistics, University of Minnesota, Minneapolis, MN, February, 2014.
9. **High-dimensional joint Bayesian variable and covariance selection: Applications in eQTL analysis and cancer genomics** - Department of Mathematics, Statistics and Computer Science, Marquette University, Milwaukee, WI, January, 2014.
10. **High-dimensional joint Bayesian variable and covariance selection: Applications in eQTL analysis and cancer genomics** - Department of Biostatistics, University of Louisville, Louisville, KY, September, 2013.
11. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Division of Statistics, Northern Illinois University, DeKalb, IL, March, 2013.
12. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, TX, October, 2012.
13. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Department of Mathematics, Statistics and Computer Science, The University of Illinois at Chicago, Chicago, IL, September, 2012.
14. **Simulation-based maximum likelihood inference for partially observed Markov process models** - Department of Statistics, Purdue University, West Lafayette, IN, February 2012.
15. **Simulation-based maximum likelihood inference for partially observed Markov process models** - Department of Statistics, George Washington University, Washington, DC, February 2012.
16. **Simulation-based maximum likelihood inference for partially observed Markov process models** - Department of Statistics, Florida State University, Tallahassee, FL, January 2012.
17. **Simulation-based maximum likelihood inference for partially observed Markov process models** - Department of Statistics and Actuarial Science, University of Waterloo, Waterloo, ON, January 2012.

Other Invited Presentations:

1. **The graphical horseshoe estimator for inverse covariance matrices** - Invited talk, ASA Conference on Statistical Learning and Data Science / Nonparametric Statistics, New York City, NY, June 2018.
2. **The graphical horseshoe estimator for inverse covariance matrices** - Invited talk, IISA Conference, Gainesville, FL, May 2018.
3. **Prediction risk for global-local shrinkage regression** - Invited talk, The 10th ICSA International Conference, Shanghai, China, December 2016.
4. **Prediction risk for global-local shrinkage regression** - Invited talk, Latent Variables 2016 Conference, Columbia, SC, October 2016.

5. **Prediction risk for global-local shrinkage regression** - Topic-contributed talk, Joint Statistical Meetings, Chicago, IL, August 2016.
6. **Prediction risk for global-local shrinkage regression** - Invited talk, 2016 ICSA Applied Statistics Symposium, Atlanta, GA, June 2016.
7. **The horseshoe+ estimator of sparse signals** - Young researchers special invited talk (45 minutes), 2015 IISA Conference, Pune, India, December 2015.
8. **Bayesian feature selection in high-dimensional regression in presence of correlated noise** - Invited talk, 2014 IISA Conference, Riverside, CA, July, 2014.
9. **Bayesian feature selection in high-dimensional regression in presence of correlated noise** - Invited talk, ISBIS and SLDM meeting, Durham, NC, June, 2014.
10. **High-dimensional joint Bayesian variable and covariance selection: Applications in eQTL analysis and cancer genomics** - Invited talk, International Conference in Honor of H. N. Nagaraja, Richardson, TX, March, 2014.
11. **Screening strategies for high-dimensional multiple predictor, multiple response data with an application in genomics** - Topic-contributed talk, Joint Statistical Meetings, Montréal, QC, August 2013.
12. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Invited talk, Statistical Bioinformatics Seminar Series, Purdue University, West Lafayette, IN, February, 2013.
13. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Invited talk, Machine Learning and Applications Seminar Series, Purdue University, West Lafayette, IN, October, 2012.
14. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Topic-contributed talk, Joint Statistical Meetings, San Diego, CA, August 2012.
15. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Invited minisymposium talk, SIAM Conference on the Life Sciences, San Diego, CA, August 2012.
16. **Joint high-dimensional Bayesian variable and covariance selection with an application to eQTL analysis** - Invited talk, The Third Biennial Workshop on Nutrition, Biostatistics and Bioinformatics, College Station, TX, February 2012.
17. **An adaptive particle allocation scheme for off-line iterated sequential importance sampling based techniques** - Invited talk, Yahoo! Research (Machine Learning Division), Santa Clara, CA, June 2011.
18. **An adaptive particle allocation scheme for off-line iterated sequential importance sampling based techniques** - Invited talk, 2011 IISA Conference on Probability, Statistics and Data Analysis, Raleigh, NC, April 2011.
19. **Iterated filtering and its applications in modeling infectious disease dynamics** - Invited talk, Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, TX, February 2010.
20. **Malaria transmission: Modeling and inference** - Invited talk, Parameter estimation for dynamical systems workshop, EURANDOM, Technische Universiteit Eindhoven, Eindhoven, The Netherlands, June 2009.

PROFESSIONAL
ACTIVITIES

- **Editorial Service:** Associate Editor, *Sankhya A*, 2018 – present.
- **Journal Referee Service:** *Bayesian Analysis*; *Bioinformatics*; *Biometrics*; *Biometrika*; *Biostatistics*; *Computational Statistics and Data Analysis*; *Epidemics*; *IEEE Transactions on Biomedical Engineering*; *Journal of Agricultural, Biological, and Environmental Statistics*; *Journal of the American Statistical Association*; *Journal of Business and Economic Statistics*; *Journal of Computational and Graphical Statistics*; *Journal of the Royal Society Interface*; *Journal of the Royal Statistical Society: Series C (Applied Statistics)*; *Statistica Sinica*; *Statistics and Probability Letters*; *Statistics in Biosciences*; *Statistics in Medicine*.
- **Program Committee Member:** The 18th International Conference on Artificial Intelligence and Statistics (AISTATS 2015).
- **Grant Reviewer:** National Security Agency (NSA).
- **Session Organizer:** “Scalable Bayesian Methods for Large and Complex Data (Invited),” 9th International Purdue Symposium on Statistics, West Lafayette, IN, June 2018; “High-dimensional Bayesian statistics: spike and slab and global-local shrinkage (Invited),” Joint Statistical Meetings, Chicago, IL, August 2016; “Statistical Methods with Applications in Biological and Epidemiological Research (Topic-contributed),” Joint Statistical Meetings, Montréal, QC, August 2013.
- **Session Chair:** “Scalable Bayesian Methods for Large and Complex Data,” 9th International Purdue Symposium on Statistics, West Lafayette, IN, June 2018; “Statistical methods for large scale data analysis,” IISA Conference, Gainesville, FL, May 2018; “Statistical Models of Risk of Chronic Diseases,” ISBIS and SLDM Meeting, Durham, NC, June, 2014; “Testing,” 2011 IISA Conference on Probability, Statistics and Data Analysis, Raleigh, NC, April 2011; “Miscellaneous Methodology III,” Joint Statistical Meetings, Washington, DC, August 2009.