

# ANINDYA BHADRA

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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> <a href="mailto:bhadra@purdue.edu">bhadra@purdue.edu</a> <i>Web:</i> <a href="http://www.stat.purdue.edu/~bhadra">http://www.stat.purdue.edu/~bhadra</a>
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"><li>• Assistant Professor, Statistics, Purdue University, August 2012 – present.</li></ul>	
EDUCATION & TRAINING	<ul style="list-style-type: none"><li>• Postdoctoral Fellow, Statistics, Texas A&amp;M University, September 2010 – July, 2012.</li><li>• Ph.D., Statistics, University of Michigan, Ann Arbor, August 2010.</li><li>• M. A., Statistics, University of Michigan, Ann Arbor, April 2007.</li><li>• Bachelor of Technology (Honors), Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur, May 2004.</li></ul>	
AWARDS AND HONORS	<ul style="list-style-type: none"><li>• Excellence in Research/Seed for Success Award, Purdue University, 2017.</li><li>• Outstanding Assistant Professor Undergraduate Teaching Award, Purdue University Department of Statistics, 2016.</li><li>• Elected Member, International Statistical Institute, 2015.</li><li>• New Researcher Fellow, Statistical and Applied Mathematical Sciences Institute (SAMSI), Fall 2014.</li></ul>	
PUBLICATIONS	<b>Journal and conference articles (published/accepted):</b> * equal contribution <sup>g</sup> graduate student collaborator <ol style="list-style-type: none"><li>1. <b>Bhadra, A.</b>, Rao, A. and Baladandayuthapani, V. (2018). Inferring network structure in non-normal and mixed discrete-continuous genomic data. <i>Biometrics</i> <b>74</b>, 185–195.</li><li>2. <b>Bhadra, A.</b> (2017). An expectation-maximization scheme for measurement error models. <i>Statistics and Probability Letters</i> <b>120</b>, 61–68.</li><li>3. <b>Bhadra, A.</b>, Datta, J., Polson, N. G. and Willard, B. (2017). The horseshoe+ estimator of ultra-sparse signals. <i>Bayesian Analysis</i> <b>12</b>, 1105–1131.</li><li>4. <b>Bhadra, A.</b>, Datta, J., Polson, N. G. and Willard, B. (2016). Default Bayesian analysis with global-local shrinkage priors. <i>Biometrika</i> <b>103</b>, 955–969.</li><li>5. <b>Bhadra, A.</b> and Carroll, R. J. (2016). Exact sampling of the unobserved covariates in Bayesian spline models for measurement error problems. <i>Statistics and Computing</i> <b>26</b>, 827–840.</li><li>6. <b>Bhadra, A.</b> and Ionides, E. L. (2016). Adaptive particle allocation in iterated sequential Monte Carlo via approximating meta-models. <i>Statistics and Computing</i> <b>26</b>, 393–407.</li></ol>	

7. Feldman, G.<sup>g</sup>, **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.

**Journal articles (under revision/submitted):**

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

TEACHING

- STAT 355: Statistics for Data Science (Spring 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

- **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:** “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.