Curriculum Vitae
Vivekananda Roy

Department of Statistics
Iowa State University
3415 Snedecor Hall
Ames, IA 50011

Phone: (515) 294-8701 (Office)
FAX: (515) 294-4040
E-mail: vroy@iastate.edu
Web: https://vroys.github.io/

Education

PhD in Statistics, 2008, University of Florida (Thesis Advisor: Prof. James P. Hobert)
Dissertation Title: Theoretical and methodological developments for Markov chain Monte Carlo algorithms for Bayesian regression

MS in Statistics, 2003, Indian Statistical Institute, Calcutta, India
Specialization: Mathematical Statistics and Probability

BS in Statistics (Honors), 2001, R. K. Mission Residential College, Narendrapur
University of Calcutta, Calcutta, India.
Minor: Mathematics and Economics

Positions

Iowa State University, Department of Statistics
Associate Professor, since 2015
Assistant Professor of Statistics, 2008–2015

Indian Statistical Institute, Kolkata, India
Visiting Scientist, Spring (partly), 2015, Summer, 2016, 2017

Université Paris-Dauphine, Paris, France
Visiting Scholar, Summer 2008

Research Interests

Convergence rates of Markov chain Monte Carlo algorithms; importance sampling; model selection; Bayes and empirical Bayes methods; high-dimensional data analysis; spatial statistics

Associate Editorship

Sankhyā, series B, since January 2016

Publications

Dixit, A. [1] and Roy, V. (2020+) Posterior impropriety of some sparse Bayesian learning models, *Statistics and Probability Letters*

Wang, R. [1], Dutta, S. and Roy V. (2020) A note on marginal correlation based screening, *Statistical Analysis and Data Mining*

Roy V. (2020) Convergence diagnostics for Markov chain Monte Carlo, *Annual Review of Statistics and Its Application*, **7**: 387-412

Evangelou, E. and Roy, V. (2019) Estimation and prediction for spatial generalized linear mixed models with parametric links via reparameterized importance sampling, *Spatial Statistics,* **29**: 289-315

Wang, X. [1], Roy, V. (2018) Convergence analysis of the block Gibbs sampler for Bayesian probit linear mixed models with improper priors, *Electronic Journal of Statistics*, **12**: 4412-4439

Wang, X. [1], Roy, V. (2018) Geometric ergodicity of Pólya-Gamma Gibbs sampler for Bayesian logistic regression with a flat prior, *Electronic Journal of Statistics*, **12**: 3295-3311

Wang, X. [1], Roy, V. and Zhu, Z. (2018) A new algorithm to estimate monotone nonparametric link functions and a comparison with parametric approach, *Statistics and Computing*, **28**: 1083-1094

Wang, X. [1], Roy, V. (2018) Analysis of the Pólya-Gamma block Gibbs sampler for Bayesian logistic linear mixed models, *Statistics and Probability Letters*, **137**: 251-256

Roy, V. , Tan, A. and Flegal, J. (2018) Estimating standard errors for importance sampling estimators with multiple Markov chains, *Statistica Sinica,* **28**: 1079-1101

Roy, V. and Chakraborty, S. (2017) Selection of tuning parameters, solution paths and standard errors for Bayesian lassos, *Bayesian Analysis,* **12**: 753-778

Dixit, A. [1] and Roy, V. (2017) MCMC diagnostics for higher dimensions using Kullback Leibler divergence, *Journal of Statistical Computation and Simulation,* **87**: 2622-2638

Laha, A., Dutta, S. and Roy V. (2017) A novel sandwich algorithm for empirical Bayes analysis of rank data, *Statistics and its Interface,* **10**: 543-556

Simpson, M. [1], Niemi, J. and Roy, V. (2017) Interweaving Markov chain Monte Carlo strategies for efficient estimation of dynamic linear models, *Journal of Computational and Graphical Statistics,* **26**: 152–159

Athreya, K. B. and Roy, V. (2016) General Glivenko-Cantelli theorems, *Stat,* **5**: 306–311

[1]The author is a graduate student and the article is part of his/her doctoral dissertation.

Roy, V. (2016) Improving efficiency of data augmentation algorithms using Peskun's theorem, *Computational Statistics* , **31**: 709–728

Roy, V., Evangelou, E. and Zhou Z. (2016) Efficient estimation and prediction for the Bayesian binary spatial model with flexible link functions, *Biometrics*, **72**: 289–298

Athreya, K. B. Normand, R. Roy, V. and Wu, S. -J. (2015) Limit theorems for the estimation of L^1 integrals using the Brownian motion, *Statistics and Probability Letters*, **100**: 42–47

Athreya, K. B. and Roy, V. (2015) Estimation of integrals with respect to infinite measures using regenerative sequences, *Journal of Applied Probability*, **52 (4)** : 1133-1145

Athreya, K. B. and Roy, V. (2014) Monte Carlo methods for improper target distributions, *Electronic Journal of Statistics*, **8**: 2664–2692

Roy, V. (2014) Efficient estimation of the link function parameter in a robust Bayesian binary regression model, *Computational Statistics and Data Analysis*, **73**: 87–102

Athreya, K. B. and Roy, V. (2014) When is a Markov chain regenerative?, *Statistics and Probability Letters*, **84**: 22–26

Roy, V. and Dey, D. (2014) Propriety of posterior distributions arising in categorical and survival models under generalized extreme value distribution, *Statistica Sinica*, **24**: 699-722

Roy, V. and Kaiser, M. S. (2013) Posterior propriety for Bayesian binomial regression models with a parametric family of link functions, *Statistical Methodology*, **13**: 25–41

Roy, V. (2012) Convergence rates for MCMC algorithms for a robust Bayesian binary regression model, *Electronic Journal of Statistics*, **6**: 2463–2485

Roy, V. (2012) Spectral analytic comparisons for Data Augmentation, *Statistics and Probability Letters*, **82**: 103–108

Hobert, J. P. , Roy, V. and Robert C. P. (2011) Improving the Convergence Properties of the Data Augmentation Algorithm with an Application to Bayesian Mixture Modeling, *Statistical Science*, **26**: 332–351

Roy, V. and Hobert, J. P. (2010) On Monte Carlo methods for Bayesian multivariate regression models with heavy-tailed errors, *Journal of Multivariate Analysis*, **101**: 1190–1202

Roy, V. and Hobert, J. P. (2007) Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression, *Journal of the Royal Statistical Society*, Series B **69**: 607–623

Book Chapters (I was invited to write these chapters.)

Roy, D. [1] Roy, V., and Dey D. K. (2015) Analysis of bivariate survival data based on copulas with log generalized extreme value marginals *Extreme Value Modeling and Risk Analysis: Methods and Applications* D. K. Dey and J. Yan, eds. Chapman & Hall/CRC Press, 475–492

Roy, V., Evangelou, E. and Zhou Z. (2015) Empirical Bayes methods for the transformed Gaussian random field model with additive measurement errors, *Current Trends in Bayesian Methodology with Applications*, S. K. Upadhyay, U. Singh, D. K. Dey and A. Loganathan, eds. Chapman & Hall/CRC Press, 521–536

Book Review (I was invited to write this review.)

Handbook of Markov chain Monte Carlo edited by S. P. Brooks, A. Gelman, G. L. Jones and X.-L. Meng, *Journal of the American Statistical Association*, **107**: 434–435

Software

bravo R package for performing Bayesian screening and variable selection in high dimensional regression models.

geoBayes R package for Bayes and empirical Bayes analysis of geostatistical data. This is joint work with E. Evangelou.

Unpublished Manuscripts

Roy, D. [1], Roy, V. and Dey D. K. (2014) Bayesian analysis of survival data under generalized extreme value distribution with application in cure rate model, Technical Report 49, Department of Statistics, University of Connecticut

Invited Presentations (Presentations by co-authors are not listed.)

"Model based screening embedded Bayesian variable selection" Birkbeck, University of London, UK November, 2020

"Posterior impropriety of relevance vector machines and a single penalty approach"[2], Bayes Comp 2020 Conference, Gainesville, Florida, January, 2020

"Estimation and prediction for spatial generalized linear mixed models"[3] EAC-ISBA[4] Conference, Kobe, Japan, July, 2019

[2] I was invited to give this talk in a topic contributed session in the conference.

[3] This presentation was made in an invited session in the conference.

[4] EAC= Eastern Asia Chapter, ISBA = International Society for Bayesian Analysis

"Selection of proposal distributions for multiple importance sampling" Indian Statistical Institute, Kolkata, India, May, 2019

"Selection of proposal distributions for multiple importance sampling" Miami University, Ohio, April, 2019

"Selection of proposal distributions for multiple importance sampling"[2] Joint Statistical Meetings (ASA[5], IMS, ENAR, WNAR, SSC), Vancouver, Canada, August, 2018

"MCMC algorithms for empirical Bayes analysis of rank data"[3] SII[6] invited session, ICSA[7] 2018 Applied Statistics Symposium, New Brunswick, June, 2018

"Selection of proposal distributions for generalized importance sampling estimators"[3] IISA[8] Conference on Statistics and Data Science for better Life, Society and Science, Hyderabad, India, December, 2017

"Effective importance sampling for Bayesian model selection"[3] IASSL[9] Conference on Statistics for Good Governance, Colombo, Sri Lanka, December, 2017

"Convergence analysis of block Gibbs samplers for Bayesian probit linear mixed models" Indian Statistical Institute, Kolkata, India, June, 2017

"Generalized importance sampling methods for estimating large number of Bayes factors"[3] IISA International Conference on Statistics, Statistical and Data Sciences: A Key to Healthy People, Planet and Prosperity, Oregon , August, 2016

"Efficient Importance Sampling Methods for Estimating Parameters in SGLMMs and Improving Prediction"[2] Joint Statistical Meetings, Chicago, Illinois, July, 2016

"Generalized importance sampling estimators with applications in Bayesian model selection" Indian Statistical Institute, Kolkata, India, July, 2016

"Standard errors for importance sampling estimators with multiple Markov chains" Indian Institute of Technology Bombay, India, July, 2016

"Standard errors for importance sampling estimators with multiple Markov chains" Indian Institute of Science Education and Research, Pune, India, July, 2016

"Standard errors for importance sampling estimators with multiple Markov chains"[3] International confer-

[5] ASA=American Statistical Association, IMS=Institute of Mathematical Statistics, ENAR=Eastern North American Region (of the International Biometric Society), WNAR=Western North American Region (of the International Biometric Society), and SSC=Statistical Society of Canada

[6] Statistics and its Interface

[7] ICSA= International Chinese Statistical Association

[8] IISA= International Indian Statistical Association

[9] IASSL= Institute of Applied Statistics, Sri Lanka

ence on recent advances in statistics, University of Mumbai, India, June, 2016

"Estimating standard errors for importance sampling estimators with multiple Markov chains" Department of Statistics and Probability, Michigan State University, East Lansing, March, 2016

"Estimating standard errors for importance sampling estimators with multiple Markov chains" Department of Statistics, University of Connecticut, Storrs, September, 2015

"Estimating standard errors for importance sampling estimators with multiple Markov chains"[2] Joint Statistical Meetings (ASA, IMS, ENAR, WNAR, SSC), Seattle, Washington, August, 2015

"Spectral Analytic Comparisons for Data Augmentation with applications in Bayesian mixture models" Indian Statistical Institute, Kolkata, India, February, 2015

"Statistical estimation of integrals with respect to infinite measures" Indian Statistical Institute, Kolkata, India, February, 2015

"Spectral Analytic Comparisons for Data Augmentation" Indian Statistical Institute, Chennai, India, February, 2015

"Statistical estimation of integrals with respect to infinite measures" Chennai Mathematical Institute, India, February, 2015

"Efficient estimation and prediction for Bayesian spatial generalized linear mixed models"[3] IASSL Conference on Statistics and Society in the New Information Age: Challenges and Opportunities, Colombo, Sri Lanka, December, 2014

"Efficient estimation and prediction for robust Bayesian spatial generalized linear mixed models"[3] IISA Conference On Research Innovations in Statistics for Health, Education, Technology, and Society, Riverside, July, 2014

"Efficient estimation and prediction for robust Bayesian spatial generalized linear mixed models"[3] ISBIS[10] 2014 and SLDM Meeting on Data Mining in Business and Industry, Durham, NC, June, 2014

"Monte Carlo methods for improper target distributions" Department of Statistics, Purdue University, Indiana, October, 2013

"Monte Carlo methods for improper target distributions" Summer at Census Scholar seminar, U. S. Census Bureau, Washington, DC, August, 2013

"Monte Carlo methods for improper target distributions" Department of Statistics, University of Missouri,

[10]ISBIS= International Society for Business and Industrial Statistics, SLDM = Section on Statistical Learning and Data Mining of the American Statistical Association

Columbia, March, 2013

"Monte Carlo methods for improper target distributions"[3] ISBA Regional Meeting and International Workshop/Conference on Bayesian Theory and Applications, Banaras Hindu University, India, January, 2013

"Monte Carlo methods for improper target distributions"[3] Young Statisticians Meet- An International Conference, Burdwan University, India, December, 2012

"Monte Carlo methods for improper target distributions" Department of Biostatistics, University of California, Los Angeles, October, 2012

"Monte Carlo methods for improper target distributions" Department of Statistics, University of California, Riverside, October, 2012

"Spectral Analytic Comparisons for Data Augmentation" Department of Statistics, Fox School of Business, Temple University, April, 2012

"Spectral Analytic Comparisons for Data Augmentation" Division of Statistics, Northern Illinois University, November, 2011

"Categorical and Survival Modeling using Generalized Extreme value Distribution" Department of Statistics and Actuarial Science, University of Iowa, April, 2011

"Spectral Analytic Comparisons for Data Augmentation"[3] IISA Conference on Probability, Statistics and Data Analysis, Raleigh, North Carolina, April, 2011

"Improving the Data Augmentation Algorithm with an Application to Bayesian Mixture Modeling" Department of Statistics, University of Nebraska, March, 2011

"Improving the Data Augmentation Algorithm with an Application to Bayesian Mixture Modeling" School of Statistics, University of Minnesota, September, 2010

"Convergence rates for MCMC algorithms for Bayesian multivariate Student's t regression"[3] 1st IIMA International Conference on Advanced Data Analysis, Business Analytics and Intelligence, Indian Institute of Management, Ahmedabad, India, June, 2009

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Centre de Recherche en Mathématiques de la Décision, Université Paris-Dauphine, Paris, France, June, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Statistics, Indiana University, February, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Mathematics, Clark University, February, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Mathematical Sciences, Clemson University, February, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Statistics, Colorado State University, February, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Mathematics, University of Arizona, January, 2008

"Convergence rates and asymptotic standard errors for MCMC algorithms for Bayesian probit regression" Department of Statistics, Iowa State University, January, 2008

"Random Walks on finite Abelian groups", UF Chapter of SIAM, Department of Mathematics, University of Florida, February, 2007

Short course

"Monte Carlo methods with applications" Chennai Mathematical Institute, India, June 10, 2019

Professional Activity

Review work

Refereeing for journals

ACM Transactions on Modeling and Computer Simulation, Advances in Applied Probability, Annals of Applied Probability, Bayesian Analysis, Bernoulli, Biometrics, Biometrika, Computational Statistics and Data Analysis, Communications in Statistics– Theory and Methods, Electronic Journal of Probability, Electronic Journal of Statistics, Environmental and Ecological Statistics, Journal of Applied Probability, Journal of the American Statistical Association, Journal of Computational and Graphical Statistics, Journal of the Royal Statistical Society, Series B, Journal of Statistical Computation and Simulation, Journal of Statistical Planning and Inference, Sankhyā, Scandinavian Journal of Statistics, Statistics & Computing, Statistics in Medicine, Statistical Methodology, Statistical Science, Statistics & Probability Letters, Statistica Sinica, Stats, The Canadian Journal of Statistics , WIRES Computational Statistics

Refereeing for books/conferences

Current Trends in Bayesian Methodology with Applications, S. K. Upadhyay, U. Singh, D. K. Dey and A. Loganathan, eds. Chapman & Hall/CRC Press, Extreme Value Modeling and Risk Analysis: Methods and Applications D. K. Dey and J. Yan, eds. Chapman & Hall/CRC Press, International Conference on Frontiers of Infrastructure Finance, Indian Institute of Technology, Kharagpur, India, 2011, International Conference on Infrastructure Finance, Indian Institute of Technology, Kharagpur, India, 2010

External review: PhD dissertation, University of Sydney, Australia, 2015

Other Professional Service and Experience

Member, Committee on Nominations, Institute of Mathematical Statistics, 2014-2015

Summer at Census Research Scholar, U. S. Census Bureau, August, 2013

Teaching

Course No. (Credit hrs)	*Title*	*Students*	*Semester*
Stat 644 (3)	Advanced Bayesian Theory	PhD stat major	F20, F18, F16, F14**
Stat 642 (3)	Advanced Probability Theory	PhD stat major	S20, S18, S17, S16
Stat 543 (3)	Theory of Probability and Statistics II	MS stat major	S19, S14, S12, S10
Stat 447 (4)	Statistical Theory for Research Workers	graduate, non-stat major	S18, F15, F14, S13, F11, S11, F10
Stat 342 (4)	Introduction to the Theory of Probability and Statistics II	undergraduate, stat major	S20, S19, F17
Stat 341 (4)	Introduction to the Theory of Probability and Statistics I	undergraduate, stat major	F20, F19, F15, S14, F13, S13
Stat 101 (4)	Principles of Statistics	undergraduate service level	F10*, F09*, S09*

** Developed this *new* course (offered as experimental Stat 644x) to provide students with a solid foundation of the theory underlying the Bayesian inference as well as computations using Markov chain Monte Carlo methods.
*two sections, F=Fall, S= Spring

Advising

Ph. D. Students

Bufei Guo (with S. Dutta), current

Run Wang (with S. Dutta), current

Yalin Rao, current

Lijin Zhang, current

Dongjin Li (with S. Dutta), current

Anand Dixit, Dissertation title: Developments in MCMC diagnostics and sparse Bayesian learning models, graduated fall 2018, Current position: Principal Biostatistician at Novartis, Hyderabad, India

Xin Wang (with Z. Zhu), Dissertation title: Topics in generalized linear mixed models and spatial subgroup analysis, graduated spring 2018, Current position: Assistant Professor at Miami University, Ohio

Dooti Roy (with D. K. Dey), Dissertation title: Univariate and multivariate survival models with flexible hazard functions, graduated spring 2017, Current position: Principal Methodology Statistician at Boehringer Ingelheim

M. S. Students

Aaron Baker, CC title: Comparison of ASIS, sandwich, sufficient and ancillary MCMC algorithms for the probit and robit Models, graduated spring 2017

Anand Dixit, CC title: Assessing Convergence of MCMC chains using Kullback Leibler divergence and smoothing methods, graduated Spring, 2016

Jason Saporta, CC title: A comparison of the efficiencies of Gibbs samplers for two parameterizations of the random effects model, graduated Fall, 2014

Fangfang Liu, CC title: Analysis of survival data with a cure fraction under generalized extreme value distribution, graduated spring, 2012

Member of Program of Study (Thesis) Committees

- 25 PhD Statistics (22 completed)
- 8 PhD Non-Statistics (6 completed)
- 6 MS Statistics (6 completed)
- 7 MS Non-Statistics (7 completed)

Awards and Scholarships

Elected member of the International Statistical Institute, 2017

LAS Early Achievement in Research Award, Iowa State University, 2017

Best Posters Award, MCMSki3, Park City, Utah, January, 2011

M. Clinton Miller, III Outstanding Poster Award, Summer Research Conference on Statistics, Richmond, Virginia, Southern Regional Council on Statistics and the American Statistical Association, 2007

First prize in the Best Student Paper Competition, Annual Meeting of Florida Chapter of the American Statistical Association, Pensacola, Florida, Florida Chapter of the American Statistical Association, 2007

The William Mendenhall Award for outstanding first-year graduate student for the 2003-04 academic year, Department of Statistics, University of Florida

GlaxoSmithKline Scholar Award, Department of Statistics, University of Florida, 2003-2004

Certificate of Outstanding Achievement, University of Florida, 2003-2007

Alumni Fellowship, University of Florida, 2003- 2007

Award for excellent performance, Indian Statistical Institute, India, 2002

Merit Scholarship, Government of West Bengal, India, 1997-2001

National Scholarship, Government of India, 1993-1996

Professional Society Memberships

American Statistical Association, since 2007

Institute of Mathematical Statistics, since 2004

International Indian Statistical Association, Life Member

International Society for Bayesian Analysis, since 2011