

James P. Hobert

Basic Information

Mailing Address:

Department of Statistics
103 Griffin Floyd Hall
University of Florida
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Education

PhD in Statistics, 1994, Cornell University (Advisor: G. Casella)

Dissertation Title: Occurrences and Consequences of Nonpositive Markov Chains in Gibbs Sampling

MS in Statistics, 1992, Cornell University (Advisor: N. S. Altman)

Thesis Title: Spatial Analysis of the Fish Species Richness of Adirondack Lakes: Applications of Geostatistics and Nonparametric Regression

BS in Chemistry, 1989, Virginia Polytechnic Institute and State University, summa cum laude

Positions

University of Florida:

Professor of Statistics, since 2007

Associate Professor of Statistics, 2000-2007

Assistant Professor of Statistics, 1994-2000

University of Minnesota:

Visiting Scholar, School of Statistics, Fall 2002

Research Interests

Convergence rates of Markov chain Monte Carlo algorithms; Perfect sampling algorithms; Connections between Markov chain theory and decision theory

Fellowship

Elected Fellow, Institute of Mathematical Statistics (IMS), 2006

Associate Editorships

Electronic Journal of Statistics, December 2010 -

Journal of the Royal Statistical Society, Series B, August 2004 - July 2008

Annals of Statistics, October 2005 - December 2006

Publications

Articles

- Khare, K. and Hobert, J. P. (2011). A spectral analytic comparison of trace-class data augmentation algorithms and their sandwich variants, *Annals of Statistics* (to appear).
- 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.
- Doss, H. and Hobert, J. P. (2010). Estimation of Bayes factors in a class of hierarchical random effects models using a geometrically ergodic MCMC algorithm, *Journal of Computational and Graphical Statistics*, **19**: 295-312.
- 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.
- Joo, Y., Casella, G. and Hobert, J. P. (2010). Bayesian model-based tight clustering for time course data, *Computational Statistics* **25**: 17-38.
- Marchev, D. and Hobert, J. P. (2009). Exact sampling from the Student's t model, *Advances and Applications in Statistics* **13**: 165-179.
- Tan, A. and Hobert, J. P. (2009). Block Gibbs sampling for Bayesian random effects models with improper priors: Convergence and regeneration, *Journal of Computational and Graphical Statistics* **18**: 861-878.
- Eaton, M. L., Hobert, J. P., Jones, G. L. and Lai, W.-L. (2008). Evaluation of formal posterior distributions via Markov chain arguments, *Annals of Statistics* **36**: 2423-2452.
- Hobert, J. P. and Marchev, D. (2008). A theoretical comparison of the data augmentation, marginal augmentation and PX-DA algorithms, *Annals of Statistics* **36**: 532-554.
- Booth, J. G., Casella, G. and Hobert, J. P. (2008). Clustering using objective functions and stochastic search, *Journal of the Royal Statistical Society, Series B* **70**: 119-139.
- Hobert, J. P. and Rosenthal, J. S. (2007). Norm comparisons for data augmentation, *Advances and Applications in Statistics* **7**: 291-302.
- 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.
- Hobert, J. P., Tan, A. and Liu, R. (2007). When is Eaton's Markov chain irreducible?, *Bernoulli* **13**: 641-652.
- Eaton, M. L., Hobert, J. P. and Jones, G. L. (2007). On perturbations of strongly admissible prior distributions, *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques* **43**: 633-653.
- Hobert, J. P., Jones, G. L. and Robert, C. P. (2006). Using a Markov chain to construct a tractable approximation of an intractable probability distribution, *Scandinavian Journal of Statistics* **33**: 37-51.

- Hobert, J. P. and Robert, C. P. (2004). A mixture representation of π with applications in Markov chain Monte Carlo and perfect sampling, *Annals of Applied Probability* **14**: 1295-1305.
- Hobert, J. P., Marchev, D. and Schweinsberg, J. (2004). Stability of the tail Markov chain and the evaluation of improper priors for an exponential rate parameter, *Bernoulli* **10**: 549-564.
- Jones, G. L. and Hobert, J. P. (2004). Sufficient burn-in for Gibbs samplers for a hierarchical random effects model, *Annals of Statistics* **32**: 784-817.
- Marchev, D. and Hobert, J. P. (2004). Geometric ergodicity of van Dyk and Meng's algorithm for the multivariate Student's t model, *Journal of the American Statistical Association* **99**: 228-238.
- Booth, J. G., Casella, G., Friedl, H. and Hobert, J. P. (2003). Negative binomial loglinear mixed models, *Statistical Modelling* **3**: 179-191.
- Hobert, J. P., Jones, G. L., Presnell, B. and Rosenthal, J. S. (2002). On the applicability of regenerative simulation in Markov chain Monte Carlo, *Biometrika* **89**: 731-743.
- Hobert, J. P. and Schweinsberg, J. (2002). Conditions for recurrence and transience of a Markov chain on \mathbb{Z}^+ and estimation of a geometric success probability, *Annals of Statistics* **30**: 1214-1223.
- Booth, J. G., Hobert, J. P. and Jank, W. (2001). A survey of Monte Carlo algorithms for maximizing the likelihood of a two-stage hierarchical model, *Statistical Modelling* **1**: 333-349.
- Jones, G. L. and Hobert, J. P. (2001). Honest exploration of intractable probability distributions via Markov chain Monte Carlo, *Statistical Science* **16**: 312-334.
- Coull, B. A., Hobert, J. P., Ryan, L. M. and Holmes, L. B. (2001). Crossed random effect models for multiple outcomes in a study of teratogenesis, *Journal of the American Statistical Association* **96**: 1194-1204.
- Hobert, J. P. (2001). Stability relationships among the Gibbs sampler and its subchains, *Journal of Computational and Graphical Statistics* **10**: 185-205.
- Agresti, A., Booth, J. G., Hobert, J. P. and Caffo, B. (2000). Random effects modeling of categorical response data, *Sociological Methodology* **30**: 27-80.
- Hobert, J. P. (2000). Hierarchical models: A current computational perspective, *Journal of the American Statistical Association* **95**: 1312-1316.
- Hobert, J. P., Robert, C. P. and Titterton, D. M. (1999). On perfect simulation for some mixtures of distributions, *Statistics and Computing* **9**: 287-298.
- Hobert, J. P. and Robert, C. P. (1999). Eaton's Markov chain, its conjugate partner and \mathcal{P} -admissibility, *Annals of Statistics* **27**: 361-373.
- Booth, J. G., Hobert, J. P. and Ohman, P. A. (1999). On the probable error of the ratio of two gamma means, *Biometrika* **86**: 439-452.

- Booth, J. G. and Hobert, J. P. (1999). Maximizing generalized linear mixed model likelihoods with an automated Monte Carlo EM algorithm, *Journal of the Royal Statistical Society, Series B* **61**: 265–285.
- Hobert, J. P. and Geyer, C. J. (1998). Geometric ergodicity of Gibbs and block Gibbs samplers for a hierarchical random effects model, *Journal of Multivariate Analysis* **67**: 414–430.
- Hobert, J. P. and Casella, G. (1998). Functional compatibility, Markov chains and Gibbs sampling with improper posteriors, *Journal of Computational and Graphical Statistics* **7**: 42–60.
- Booth, J. G. and Hobert, J. P. (1998). Standard errors of prediction in generalized linear mixed models, *Journal of the American Statistical Association* **93**: 262–272.
- Hobert, J. P., Altman, N. S. and Schofield, C. L. (1997). Analyses of fish species richness with spatial covariate, *Journal of the American Statistical Association* **92**: 846–854.
- Hobert, J. P., Robert, C. P. and Goutis, C. (1997). Connectedness conditions for the convergence of the Gibbs sampler, *Statistics and Probability Letters* **33**: 235–240.
- Hobert, J. P. and Casella, G. (1996). The effect of improper priors on Gibbs sampling in hierarchical linear mixed models, *Journal of the American Statistical Association* **91**: 1461–1473.

Commentary

- Hobert, J. P. and Román, J. C. (2011). Discussion of “To center or not to center: That is not the question - An ancillarity-sufficiency interweaving strategy (ASIS) for boosting MCMC efficiency,” by Y. Yu and X.-L. Meng, *Journal of Computational and Graphical Statistics* **20**: 571–580.
- Hobert, J. P. and Robert, C. P. (2007). Comment on “Deriving Bayesian and frequentist estimators from time-invariance estimating equations: a unifying approach” by A. Mira and A. Baddeley, in *Bayesian Statistics 8*, eds., J. M. Bernardo, S. Bayarri, J. O. Berger, A. P. Dawid, D. Heckerman, A. F. M. Smith, and M. West, Oxford University Press.
- Hobert, J. P. (2001). Discussion of “The art of data augmentation,” by D. A. van Dyk and X.-L. Meng, *Journal of Computational and Graphical Statistics* **10**: 59–68.
- Hobert, J. P. and Casella, G. (1996). Comments on “Quantifying and using expert opinion for variable-selection problems in regression,” by P. H. Garthwaite and J. M. Dickey, *Chemometrics and Intelligent Laboratory Systems* **35**: 37–40.

Miscellanea

- Hobert, J. P. (2011). The Data Augmentation Algorithm: Theory and Methodology, *Handbook of Markov Chain Monte Carlo*, S. Brooks, A. Gelman, G. Jones and X.-L. Meng, eds. Chapman & Hall/CRC Press.
- Jones, G. L. and Hobert, J. P. (2001). Markov chain Monte Carlo, *The Encyclopedia of Environmetrics*, W. Piegorisch and A. El-Shaarawi, eds. Wiley, New York.

Grants

PI, “Problems in Bayesian Model Selection and Development and Analysis of Markov Chain Sampling Algorithms,” National Science Foundation - Division of Mathematical Sciences (Statistics), with H. Doss, 2011-2014, DMS-11-06395.

PI, “Development and Analysis of MCMC Algorithms and Computational Methods in Bayesian Sensitivity Analysis,” National Science Foundation - Division of Mathematical Sciences (Statistics), with H. Doss, 2008-2012, DMS-08-05860.

PI, “Exact and Approximate Markov Chain Sampling Algorithms,” National Science Foundation - Division of Mathematical Sciences (Statistics), 2005-2009, DMS-05-03648.

PI, “Combining EM and Monte Carlo to Maximize Intractable Likelihood Functions,” National Science Foundation - Division of Mathematical Sciences (Statistics), with J. Booth, 2000-2004, DMS-00-72827.

PhD Students

Galín L. Jones (PhD: August 2001) Dissertation title: Convergence Rates and Monte Carlo Standard Errors for Markov Chain Monte Carlo Algorithms. Current position: Associate Professor, School of Statistics, University of Minnesota.

Dobrin Marchev (PhD: August 2004) Dissertation title: Monte Carlo Methods for Posterior Distributions Associated with Multivariate Student’s t Data. Current position: Lecturer, School of Mathematics and Statistics, University of Sydney (Australia)

Vivekananda Roy (PhD: August 2008) Dissertation title: Theoretical and Methodological Developments for Markov chain Monte Carlo Algorithms for Bayesian Regression. Current position: Assistant Professor, Department of Statistics, Iowa State University.

Aixin Tan (PhD: August 2009) Dissertation title: Convergence Rates and Regeneration of the Block Gibbs Sampler for Bayesian Random Effects Models. Current position: Assistant Professor, Department of Statistics and Actuarial Science, University of Iowa.

Special Invited Seminars

“Honest Exploration of Intractable Probability Distributions via Markov Chain Monte Carlo” The 3rd Annual Distinguished Professor S. James Press Endowed Lecture, Department of Statistics, University of California, Riverside, April 7, 2009

“A Theoretical Comparison of the Data Augmentation, Marginal Augmentation and PX-DA Algorithms” The 2007 Helen Searle Memorial Lecture, Department of Biological Statistics and Computational Biology, Cornell University, September 19, 2007.

“Functional Compatibility, Markov Chains and Gibbs Sampling with Improper Posteriors” 30th Symposium on the Interface: Computing Science and Statistics, University of Minnesota, May 14, 1998. Session title: “This Year’s

Best of *JCGS*: Bayesian Computing.”

Other Invited Seminars

“Improving the Data Augmentation Algorithm” (1) Optimisation of MCMC Algorithms Workshop, University of Warwick, Coventry, England, June 2, 2009. (2) Analysis and Probability in Nice, Session II, Université of Nice, Sophia Antipolis, Nice, France, June 17, 2009. (3) Department of Statistics, University of Michigan, November 20, 2009 (4) Department of Statistics, University of Toronto, March 18, 2010. (5) Center for Vision, Graphics & Medical Imaging, Department of Computer & Information Science & Engineering, University of Florida, April 8, 2010. (6) Department of Statistics and Actuarial Science, University of Iowa, October 7, 2010. (7) Information Theory and Applications Workshop, University of California, San Diego, February 10, 2011. (8) Department of Statistics, Iowa State University, April 4, 2011. (9) School of Mathematics and Statistics, University of Sydney, Australia, June 10, 2011.

“Honest Exploration of Intractable Probability Distributions via Markov Chain Monte Carlo” (1) Analysis and Probability in Nice, Université of Nice, Sophia Antipolis, Nice, France, June 25, 2008. (2) Ulam Centennial Conference, University of Florida (Department of Mathematics), March 11, 2009. (3) Mathematics Research Communities conference on “Modern Markov Chains and their Statistical Applications,” Snowbird, Utah, June 28, 2009.

“A Theoretical Comparison of the Data Augmentation, Marginal Augmentation and PX-DA Algorithms” (1) Centre de Recherche en Mathématiques de la Décision, Université Paris-Dauphine, Paris, France, June 9, 2006. (2) The Annual Meeting of the International Biometric Society, WNAR¹, Flagstaff, AZ, June 29, 2006. (3) DIMACS Workshop: “Markov Chain Monte Carlo: Synthesizing Theory and Practice”, Rutgers University, June 6, 2007. (4) Department of Statistical Science, Duke University, October 12, 2007. (5) Department of Mathematics (Applied Mathematics Seminar), University of Florida, October 24, 2007. (6) Department of Statistics, University of Toronto, November 8, 2007.

“Markov Chain Conditions for Admissibility” (1) Department of Statistical Science, Cornell University, April 29, 2005. (2) The 2005 Summer Research Conference in Statistics sponsored by SRCOS and ASA, Clemson University, June 7, 2005. (3) School of Statistics, University of Minnesota, September 29, 2005. (4) Departments of Statistics and Epidemiology & Biostatistics, University of South Carolina, October 20, 2005.

“A Mixture Representation of the Stationary Distribution” (1) The 2004 Summer Research Conference in Statistics sponsored by SRCOS and ASA, Virginia Polytechnic Institute and State University, June 7, 2004. (2) Annual Meeting of the International Biometric Society, WNAR, Albuquerque, NM, June 29, 2004. (3) Joint Statistical Meetings (ASA, IMS, ENAR, WNAR, SSC), Toronto, Canada, August 8, 2004. (4) Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, November 10, 2004. (5) Department of Statistics and Computer Information Systems, Baruch College (NY City), November 12, 2004. (6) Department of Statistics, Harvard University, November 15, 2004.

¹ASA=American Statistical Association, ENAR=Eastern North American Region (of the International Biometric Society), DIMACS=Center for Discrete Mathematics & Theoretical Computer Science, SRCOS=Southern Regional Council on Statistics, WNAR=Western North American Region (of the International Biometric Society), and SSC=Statistical Society of Canada

- “Evaluating Improper Priors for a Geometric Success Probability” School of Statistics, University of Minnesota, February 24, 2003.
- “Perfect Sampling: Basic Ideas and an Interesting Connection” School of Statistics and Department of Biostatistics, University of Minnesota, December 4, 2002.
- “Honest Markov Chain Monte Carlo via Drift and Minorization” (1) The Fourth International Symposium on Probability and its Applications, Banff, Canada, July 31, 2002. (2) Joint Statistical Meetings (ASA, IMS, ENAR, WNAR, SSC), New York City, NY, August 14, 2002. (3) School of Statistics, University of Minnesota, September 19, 2002. (4) Challenges in Stochastic Computation Workshop, Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, NC, September 28, 2002. (5) Department of Statistical Science, Cornell University, May 19, 2004.
- “A Mixture Representation of π with Applications to Perfect Sampling” 27th Conference on Stochastic Processes and their Applications, Centre for Mathematical Sciences, University of Cambridge, Cambridge, UK, July 10, 2001.
- “Perfect Sampling: Basic Ideas and a Recent Result” Institut für Statistik, Technische Universität Graz, Graz, Austria, June 28, 2001.
- “Stability Relationships Among the Gibbs Sampler and Its Subchains” (1) Department of Statistics, University of Georgia, September 23, 1999. (2) Conference in Honor of Roger Farrell, Department of Mathematics, Cornell University, September 25, 1999. (3) Department of Operations Research and Industrial Engineering, Cornell University, February 15, 2000. (4) French National Institute of Statistics and Economic Studies (INSEE), Paris, France, June 13, 2000. (5) Institut für Statistik, Ludwig-Maximilians-Universität München (University of Munich), Munich, Germany, June 20, 2000. (6) Third Annual Symposium on Selected Topics in Statistics (Monte Carlo in the New Millennium), University of Florida, January 12, 2001. (7) Department of Statistics, University of Toronto, April 12, 2001.
- “Maximizing Generalized Linear Mixed Model Likelihoods With an Automated Monte Carlo EM Algorithm” (1) National Science Foundation/CBMS Regional Conference on Generalized Linear Mixed Models and Related Topics, University of Florida, June 12, 1999. (2) Spring Meeting of the International Biometric Society (Eastern North American Region), Chicago, IL, March 21, 2000.
- “Geometric Ergodicity of Gibbs and Block Gibbs Samplers for a Hierarchical Random Effects Model” (1) French National Institute of Statistics and Economic Studies (INSEE), Paris, France, May 12, 1997. (2) Department of Statistics, Rutgers University, November 23, 1998.
- “Monte Carlo EM for Generalized Linear Mixed Models” French National Institute of Statistics and Economic Studies (INSEE), Paris, France, June 12, 1998.
- “Compatibility of Conditional Densities and Gibbs Sampling” Statistics Center, Cornell University, July 18, 1995.

Professional Service

National Science Foundation Panel, Human and Social Dynamics Modelling Competition (Directorate for Social, Behavioral & Economic Sciences), May 19-20, 2005.

National Science Foundation Panel, Information Technology Research (Division of Mathematical Sciences), May 2-3, 2002.

Major Departmental Service (University of Florida)

Graduate Coordinator, since Fall 2001

Chair, Faculty Search Committee, Spring 2002, 2008, 2011

Co-organizer of the “Monte Carlo in the New Millennium” conference, January 2001