

James G. Scott

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Academic appointments

UNIVERSITY OF TEXAS AT AUSTIN

Associate Professor of Statistics, September 2015 – present
Department of Information, Risk, and Operations Management
Department of Statistics and Data Science

Assistant Professor of Statistics, July 2009 – August 2015
Department of Information, Risk, and Operations Management

Education

DUKE UNIVERSITY

Ph.D. in Statistics, 2006–09
Thesis: Bayesian Adjustment for Multiplicity
Advisor: James O. Berger

UNIVERSITY OF CAMBRIDGE (TRINITY COLLEGE)

M.A.St in Mathematics (Part III), 2004–05
Undertaken while holding a Marshall Scholarship

UNIVERSITY OF TEXAS AT AUSTIN

B.S. in Mathematics and Plan II Honors, 2000–2004

External funding

[PI] “NIH T32 Training Grant in Biomedical Big Data.” National Institutes of Health, September 2016 – August 2021.

[PI] “CAREER: Bringing richly structured Bayesian models into the discrete-data realm via new data-augmentation theory and algorithms.” National Science Foundation (DMS), July 2013 – June 2018.

[Co-Pi] Bayesian Approaches For Missing Data And Causal Inference In Cancer And Behavioral Studies, with PI Mike Daniels. National Institutes of Health, February 2014–February 2018.

[Co-PI] “Augmentation and Use of BioSense 2.0 for Early Detection and Surveillance of Emerging Infectious Diseases and Biological Threats,” with PI Lauren Meyers. Contract with Texas Department of State Health Services, Sept 2012 – Aug 2013.

[Co-PI] “Decision-Support Tool for Pandemic Flu Vaccination Strategies and Priorities,” with PIs Lauren Meyers and David Morton and co-PI Gregory Johnson. Contract with Texas Department of State Health Services, Sept 2012 – Aug 2013.

Books

AIQ: How People and Machines are Smarter Together. N. Polson and J. Scott. St. Martin's Press (Macmillan), in press, to appear May 2018.

Steven D. Levitt, co-author of *Freakonomics*, said of our book: "There comes a time in the life of a subject when someone steps up and writes *the* book about it. AIQ explores the fascinating history of the ideas that drive this technology of the future and demystifies the core concepts behind it; the result is a positive and entertaining look at the great potential unlocked by marrying human creativity with powerful machines."

Pre-prints and papers under review

O.H.M Padilla, A. Athey, A Reinhart, JG Scott. Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. arXiv:1612.07867.

N.G. Polson and J.G. Scott. A deconvolution path for mixtures O.M. Padilla, arXiv:1511.06750.

O.M. Padilla and J.G. Scott. Nonparametric density estimation by histogram trend filtering. arXiv:1509.04348.

Peer-reviewed journal articles

P. Lohr, J. Starling, J.G. Scott, A. Aiken. Simultaneous versus interval medical abortion regimens where home-use is restricted: a cohort study. *Obstetrics and Gynecology* 2018, to appear.

O.H.M. Padilla, J.G. Scott, J. Sharpnack, R.J. Tibshirani. The DFS Fused Lasso: Linear-Time Denoising over General Graphs. arXiv:1608.03384. Accepted in the *Journal of Machine Learning Research*.

W. Tansey, O. Koyejo, R. Poldrack, and James G. Scott. False discovery rate smoothing, arXiv preprint arXiv:1411.6144. Accepted in the *Journal of the American Statistical Association*.

W. Tansey, A. Athey, A. Reinhart, and James G. Scott. Multiscale spatial density smoothing: an application to large-scale radiological survey and anomaly detection. *Journal of the American Statistical Association* 112(519): 1047–63 (2017).

O. Madrid Padilla and James G. Scott. Tensor decomposition with generalized lasso penalties. *Journal of Computational and Graphical Statistics* 26(3): 537–46 (2017).

M. Zhou, James G. Scott, and O. Madrid Padilla. Priors for Random Count Matrices Derived from a Family of Negative Binomial Processes. *Journal of the American Statistical Association (Theory and Methods)* 111(515): 1144–56 (2016).

ARA Aiken, JG Scott, R Gomperts, J Trussell, M Worrell, CE Aiken. Requests for abortion in Latin America related to concern about Zika virus exposure. *New England Journal of Medicine* 375 (4), 396-398 (2016).

S.V. Scarpino, J.G. Scott, R. Eggo, N.B. Dimitrov, and L.A. Meyers. Data Blindspots: High-Tech Disease Surveillance Misses the Poor. *Online Journal of Public Health Informatics* 8:1, (2016).

- RM Eggo, JG Scott, AP Galvani, LA Meyers. Respiratory virus transmission dynamics determine timing of asthma exacerbation peaks: Evidence from a population-level model. *Proceedings of the National Academy of Sciences* 113 (8), 2194-2199 (2016).
- C Aiken, AR Aiken, JG Scott, JC Brockelsby. The influence of hours worked prior to delivery on maternal and fetal outcomes. *American Journal of Obstetrics & Gynecology* 215(5):634 (2016).
- P Buddhavarapu, JG Scott, JA Prozzi. Modeling unobserved heterogeneity using finite mixture random parameters for spatially correlated discrete count data. *Transportation Research Part B: Methodological* 91, 492-510 (2016).
- A. Aiken and James G. Scott. Family Planning Policy in the United States: The Converging Politics of Abortion and Contraception. *Contraception* 93(5): 412–20, 2016.
- CE Aiken, AR Aiken, JG Scott, JC Brockelsby, J Trussell. Weekend working: a retrospective cohort study of maternal and neonatal outcomes in a large NHS delivery unit. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 199, 5-10 (2016).
- N. Polson and James G. Scott. Mixtures, envelopes, and hierarchical duality. *Journal of the Royal Statistical Society, Series B. Volume 78(4)*, pp 701-27 (2016).
- J.G. Scott, T. Shively and S. Walker. Nonparametric Bayesian testing for monotonicity. *Biometrika* 102(3), 617-30 (2015).
- N. Polson, James G. Scott, and B. Willard. Proximal algorithms in statistics and machine learning. *Statistical Science* 30(4): 559–71 (2015).
- SW Davies, SV Scarpino, T Pongwarin, J Scott, MV Matz. Estimating Trait Heritability in Highly Fecund Species. *G3: Genes— Genomes— Genetics* 5 (12), 2639–45, 2015.
- James G. Scott, R. Kelly, M. Smith, P. Zhou, and R. Kass. False discovery rate regression: an application to neural synchrony detection in primary visual cortex. *Journal of the American Statistical Association* 110 (510): 459-471, 2015.
- A. Aiken, C. Aiken, M. Alberry, J. Brocklesby, and James G. Scott. Management of Fetal Malposition in the Second Stage of Labor: A Propensity Score Analysis. *American Journal of Obstetrics and Gynecology* 212: 3, p. 355, 2015.
- Nicholas G. Polson, James G. Scott, and J. Windle. The Bayesian bridge. *Journal of the Royal Statistical Society, Series B: Statistical Methodology* 76:4 (713–33), 2014.
- C.E. Aiken, A.R. Aiken, J.C. Brockelsby, and James G. Scott. Factors influencing the likelihood of instrumental delivery success. *Obstetrics and Gynecology*, 123(4):796–803, 2014.
- Nicholas G. Polson, James G. Scott, and Jesse Windle. Bayesian inference for logistic models using Polya-Gamma latent variables. *Journal of the American Statistical Association*, 108(504):1339–49, 2013.
- Mikhail V. Matz, Rachel M. Wright, and James G. Scott. No control genes required: Bayesian analysis of qrt-pcr data. *PLOS One*, 8(8), 2013.
- Nicholas G. Polson and James G. Scott. Data augmentation for non-Gaussian regression models using variance-mean mixtures. *Biometrika*, 100(2):459–71, 2013.

- Nicholas G. Polson and James G. Scott. Local shrinkage rules, Lévy processes, and regularized regression. *Journal of the Royal Statistical Society (Series B)*, 74(2):287–311, 2012.
- P.R. Hahn, Carlos M. Carvalho, and James G. Scott. A sparse factor-analytic probit model for Congressional voting patterns. *Journal of the Royal Statistical Society, Series C*, 61(4):619–35, 2012.
- Nicholas G. Polson and James G. Scott. Good, great, or lucky? Screening for firms with sustained superior performance using heavy-tailed priors. *The Annals of Applied Statistics*, 6(1):161–85, 2012.
- James G. Scott. Benchmarking historical corporate performance. *Computational Statistics & Data Analysis*, 56(6):1795–1807, 2012.
- Nicholas G. Polson and James G. Scott. On the half-Cauchy prior for a global scale parameter. *Bayesian Analysis*, 7(4):887–902, 2012.
- James G. Scott. Bayesian estimation of intensity surfaces on the sphere via needlet shrinkage and selection. *Bayesian Analysis*, 6(2):307–28, 2011.
- James G. Scott and James O. Berger. Bayes and empirical-Bayes multiplicity adjustment in the variable-selection problem. *The Annals of Statistics*, 38(5):2587–2619, 2010.
- Carlos M. Carvalho, Nicholas G. Polson, and James G. Scott. The horseshoe estimator for sparse signals. *Biometrika*, 97(2):465–80, 2010.
- Carlos M. Carvalho and James G. Scott. Objective Bayesian model selection in Gaussian graphical models. *Biometrika*, 96(3):497–512, 2009.
- James G. Scott. Nonparametric Bayesian multiple testing for longitudinal performance stratification. *The Annals of Applied Statistics*, 3(4):1655–74, 2009.
- James G. Scott and Carlos M. Carvalho. Feature-inclusion stochastic search for Gaussian graphical models. *Journal of Computational and Graphical Statistics*, 17(790–808), 2008.
- Ted von Hippel, William H. Jefferys, James Scott, Nathan Stein, D. E. Winget, Steven DeGennaro, Albert Dam, and Elizabeth Jeffery. Inverting color-magnitude diagrams to access precise star cluster parameters: a Bayesian approach. *The Astrophysical Journal*, (645):1436–47, 2006.
- James G. Scott and James O. Berger. An exploration of aspects of Bayesian multiple testing. *Journal of Statistical Planning and Inference*, 136(7):2144–2162, 2006.

Peer-reviewed conference papers

- W Tansey, K Pichotta, JG Scott. Leaf-Smoothed Hierarchical Softmax for Ordinal Prediction. *The Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-18)*, 2018.
- W Tansey, J Thomason, JG Scott. Maximum-Variance Total Variation Denoising for Interpretable Spatial Smoothing. *The Thirty-Second AAAI Conference on Artificial Intelligence (AAAI-18)*, accepted 2018.
- W. Tansey and James G. Scott. Diet2Vec: Multi-scale analysis of massive dietary data. *Neural Information Processing Systems, Workshop on Machine Learning for Health (NIPS)*

ML4HC), 2016.

James G. Scott and Jason Baldridge. A recursive estimate for the predictive likelihood in a topic model. In *Proceedings of the 16th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2013.

J.W. Pillow and James G. Scott. Fully bayesian inference for neural models with negative-binomial spiking. In *Advances in Neural Information Processing Systems (NIPS)*, volume 25, 2012.

Carlos M. Carvalho, Nicholas G. Polson, and James G. Scott. Handling sparsity via the horseshoe. *Journal of Machine Learning Research: Workshops and Case Proceedings*, 5:73–80, 2009.

Book chapters (non-peer-reviewed)

Nicholas G. Polson and James G. Scott. Shrink globally, act locally: sparse Bayesian regularization and prediction (with discussion). In J. M. Bernardo, M. J. Bayarri, J. O. Berger, A. P. Dawid, D. Heckerman, A. F. M. Smith, and M. West, editors, *Proceedings of the 9th Valencia World Meeting on Bayesian Statistics*, pages 501–38. Oxford University Press, 2011.

Matthew J. Heaton and James G. Scott. Bayesian computation and the linear model. In Ming-Hui Chen, Dipak Dey, Peter Mueller, Dongchu Sun, and Keying Ye, editors, *Frontiers of Statistical Decision Making and Bayesian Analysis*. Springer, 2010.

Z. Liu, J. Windle, and James G. Scott. The partition problem: case studies in Bayesian screening for time-varying model structure (with). arXiv:1111.0617v1 [stat.AP]. *Bayesian Theory and Applications: Essays in Honor of Adrian Smith*. Oxford University Press (2012).

J.M. Quintana, C.M. Carvalho, James G. Scott and T. Costigliola. Bayesian forecasting, futures markets, and risk modelling. *Handbook of Applied Bayesian Analysis*. Edited by Anthony O’Hagan and Mike West. Oxford University Press (2010).

Other academic publications (non-peer-reviewed)

James G. Scott. Invited discussion of “Inference in two-piece location-scale models with Jeffreys priors.” *Bayesian Analysis* 9(1): 25–8 (2014). (Role: discussant)

T. von Hippel, W. Jefferys, D. Winget, and James G. Scott. 14th European Workshop on White Dwarfs, ASP Conference Series, Vol. 334, p.77–80. Edited by D. Koester and S. Moehler. San Francisco: Astronomical Society of the Pacific (2005)

Textbooks

Statistical Modeling: A Gentle Introduction. A free introductory textbook on statistical modeling, available on my website.

Teaching

SDS 385: statistical models for big data. Fall ’16, Fall ’17.

SDS 383D: a capstone course on applied statistical modeling for Ph.D students. Spring '13, Spring '14, Spring '15, Spring '17.

SSC 325H: a course on probability and statistical modeling for honors undergraduates in all disciplines. Spring '12, Spring '13, Spring '15.

STA 371: a course for undergraduate business majors on statistical modeling, regression, time series, and decision theory. Spring '10; Spring '11, Spring '12, Spring '14, Spring '15.

NSC 110: a seminar on research methods for freshmen honors students in natural sciences. I taught this course on an off-load, volunteer basis. Fall '10; Fall '11; Fall '12.; Fall '13.

Fellowships and awards: national and international

Bayarri Award (2016). Awarded for early-career research achievements to a Bayesian statistician under 35 years old by the International Society for Bayesian Analysis.

NSF CAREER Award (2013).

Savage Award (2010): one award is given each year by the International Society of Bayesian Analysis for a doctoral dissertation that makes important original contributions to the foundations, theoretical developments, and/or general methodology of Bayesian analysis.

National Science Foundation Graduate Research Fellowship, 2006–2009

Marshall Scholarship, 2004–2006

Fellowships and awards: university

McCombs School of Business Award for Research Excellence (2017).

CBA Foundation Research Award for Assistant Professors (2014).

UT System Regents' Outstanding Teaching Award (2014).

Trammell/CBA Foundation Teaching Award for Assistant Professors (2013).

Teaching Excellence Award in the College of Natural Sciences (2012).

University of Texas Junior Fellow in British Studies (2012-present)

University service: ongoing

Dean's committee on the future of math and science undergraduate education (CNS curriculum), 2016.

Assistant Director of Undergraduate Studies, Department of Statistics and Data Sciences, 2012–present.

University Selection Committee for Rhodes and Marshall Scholarships, 2009–present

Steering Committee for the Dean's Scholars Honors Program in the Natural Sciences, 2009–present

University service: completed

Campus Conversation Committee on measurement and evaluation of teaching

effectiveness, 2015.

Board of Directors, Texas Exes Scholarship Foundation, 2009–2013. The board oversees all scholarship programs run by the university's alumni association, including investments, fund-raising, and selection of scholarship recipients. We disbursed over \$2.1 million in scholarships to UT students in 2012.

Selection Committee for the UT Forty Acres Scholarship, 2010–12

Mathematics Undergraduate Program Review Committee, 2011–2012. I served as the McCombs representative to a committee whose goal is to review the undergraduate mathematics curriculum, particularly the calculus sequence, for all non-mathematics majors at UT–Austin.

Undergraduate Curriculum Committee for the Division of Statistics and Scientific Computing, 2011–2012. Oversaw development of an undergraduate Certificate in Applied Data Analysis.

Ph.D Curriculum Planning Committee, Statistics and Scientific Computation, 2010–11

Professional service

Associate Editor for: *The Annals of Applied Statistics* (2011–), *Journal of Computational and Graphical Statistics* (2017–)

Referee for: *Journal of the Royal Statistical Society*; *Journal of the American Statistical Association*; *Biometrika*; *Journal of Econometrics*; *Annals of Applied Statistics*; *Biometrics*; *Biostatistics*; *Electronic Journal of Statistics*; *Bayesian Analysis*; *Journal of Business and Economic Statistics*; *Journal of the Indian Statistical Association*; *The Scandinavian Journal of Statistics*; *Computational Statistics and Data Analysis*; *Communications in Statistics*; *Transportation Research*; *The Astrophysical Journal*.

Reviewing committee for: AISTats ('13 area chair, '12, '10), NIPS ('13, '12, '10), 2010 Seminar on Bayesian Inference in Econometrics and Statistics (SBIES)

Session organizer for: 2013 JSM; 2010 SBIES

Industry

People Pattern (Austin, TX)

December 2013 – September 2016: statistical consulting on issues relating to digital marketing.

Deloitte Consulting (San Francisco, CA)

April 2007 – October 2010: statistical consulting on issues relating to longitudinal stratification and testing of historical corporate performance

Bayesian Efficient Strategic Training (Hoboken, NJ)

July 2007 – August 2007: statistical consulting on issues relating to nonlinear regression and graphical models in portfolio-allocation problems