

JEFFREY W. MILLER

Harvard School of Public Health	<i>Email:</i> jwmiller@hsph.harvard.edu
Department of Biostatistics	<i>Website:</i> http://jwmi.github.io/
655 Huntington Ave, 1-419	<i>Citizenship:</i> USA
Boston, MA 02115	<i>Last updated:</i> February 10, 2017

PROFESSIONAL EXPERIENCE

Harvard University , Boston, MA Assistant Professor, Department of Biostatistics	2016-present
Duke University , Durham, NC Postdoctoral Associate, Department of Statistical Science	2014-present
Brown University , Providence, RI Postdoctoral Associate, Division of Applied Mathematics	Summer 2014
Draper Laboratory , Cambridge, MA Member of Technical Staff, Cognitive Robotics Group	2005-2008
United States Air Force , Air Force Research Lab, Tyndall AFB, FL Highest rank: Captain. Project Manager, Robotics Research Group	2002-2005

EDUCATION

Brown University , Providence, RI PhD, Applied Mathematics. Advisers: Matthew T. Harrison and Stuart Geman Master of Science, Mathematics	2008-2014 2008-2010
PhD Dissertation: <i>Nonparametric and Variable-Dimension Bayesian Mixture Models: Analysis, Comparison, and New Methods</i> . Brown University, Division of Applied Mathematics, 2014.	
Stanford University , Stanford, CA Master of Science, Mechanical Engineering	2001-2002
Georgia Institute of Technology , Atlanta, GA Bachelor of Science, Mechanical Engineering	1997-2001

CURRENT RESEARCH INTERESTS

Studying longevity and aging at the cellular/molecular level. Statistical methods for estimating biological networks. Cancer phylogenetics / clonal evolution. Nonparametric methods and robustness to model misspecification. Machine learning for precision aging medicine. Statistics for closed-loop experimentation – inference, design, and experimentation in an automated loop (IDEAL).

PUBLICATIONS

J. W. Miller and M. T. Harrison. *Mixture models with a prior on the number of components*. **Journal of the American Statistical Association (JASA)**, (In press), 2017.

B. Betancourt, G. Zanella, J. W. Miller, H. Wallach, A. Zaidi, and B. Steorts. *Flexible models for microclustering with application to entity resolution*. **Advances in Neural Information Processing Systems (NIPS)**, Vol. 29, 2016, pp. 1417-1425.

J. W. Miller, B. Betancourt, A. Zaidi, H. Wallach, and R. C. Steorts. *Microclustering: When the cluster sizes grow sublinearly with the size of the data set*. Bayesian Nonparametrics: The Next Generation workshop, NIPS 2015.

J. W. Miller and M. T. Harrison. *Inconsistency of Pitman–Yor process mixtures for the number of components*. **Journal of Machine Learning Research**, Vol. 15, 2014, pp. 3333-3370.

J. W. Miller and M. T. Harrison. *A simple example of Dirichlet process mixture inconsistency for the number of components*. **Advances in Neural Information Processing Systems (NIPS)**, Full oral presentation, Vol. 26, 2013.

J. W. Miller and M. T. Harrison. *Exact sampling and counting for fixed-margin matrices*. **The Annals of Statistics**, Vol. 41, No. 3, 2013, pp. 1569-1592.

J. W. Miller. *Reduced criteria for degree sequences*. **Discrete Mathematics**, Vol. 313, Issue 4, 2013, pp. 550-562.

PREPRINTS AND WORK-IN-PROGRESS

J. W. Miller and D. B. Dunson. *Robust Bayesian inference via coarsening*. Revision submitted (JASA), 2017, arXiv:1506.06101.

M. T. Harrison and J. W. Miller. *Importance sampling for weighted binary random matrices with specified margins*. In preparation, arXiv:1301.3928.

J. W. Miller and D. B. Dunson. *Concentration and asymptotic normality of generalized posteriors*. In preparation.

AWARDS

ISBA New Researchers Travel Award, June 17, 2016 (International Society for Bayesian Analysis 2016 World Meeting). One of two recipients.

Brown University Outstanding Dissertation Award in the Physical Sciences, generously sponsored by the Joukowsky Family Foundation (2014).

1st Prize for Poster by a Young Participant, June 14, 2013, BNP9 (9th Conference on Bayesian Non-parametrics, Amsterdam).

Sigma Xi Outstanding Graduate Student Award, May 9, 2013, Brown University chapter of Sigma Xi. “For excellence in research and high potential for further contributions to science.” One of three recipients.

Presidential Award for Excellence in Teaching, May 7, 2012, Brown University. One graduate student is selected for the award each year, out of approximately 400 with teaching positions.

IBM Thomas J. Watson Research Center Student Research Award, April 16, 2011, New England Statistics Symposium (NESS). One of four winners of this award for “outstanding research in the field of Statistics and Probability.”

GRANTS AND FUNDING

Funding awarded to organize the Radcliffe exploratory seminar, “Statistics When the Model is Wrong,” 2017-2018.

Travel grant for “Bayesian Nonparametrics: The Next Generation” workshop at NIPS 2015.

Graduate School Travel Grant, 2011-2013, Brown University. (Supplemental funding for travel.)

Supported in part by NSF, NIH, and DARPA grants, under advisor supervision, 2011-2015.

National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2001-2002, 2008-2011.

Air Force ROTC Full Scholarship, 1997-2001.

TEACHING

Created over 250 short video lectures (each around 10-15 minutes), freely available online at the *mathematicalmonk* YouTube channel. Topics covered include introductory probability, machine learning, and information theory. To date, the total number of views exceeds 4.5 million.

Advanced Stochastic Modeling (Duke, STA 531), Spring 2016. Primary instructor.

Bayesian and Modern Statistics (Duke, STA 360/601), Spring 2015. Primary instructor.

Information Theory (Brown, APMA 1710), Fall 2011. Primary instructor.

Introduction to Machine Learning (Brown, CSCI 1950-F), Summer 2011. Primary instructor.

Bayesian and Modern Statistics (Duke, STA 360/601), Fall 2014 & 2015. Alternate lecturer.

Recent Applications of Probability and Statistics (Brown, APMA 2610), Spring 2013. Teaching assistant.

Computational Probability and Statistics (Brown, APMA 1690), Fall 2012. Teaching assistant.

Essential Statistics (Brown, APMA 0650), Spring 2012. Teaching assistant.

Math Resource Center (MRC), Fall 2009. Tutor. (Tutoring undergraduates for one evening each week.)

TALKS

9th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM-Statistics 2016), Dec 11, 2016, Seville, Spain. *Non-standard approaches to nonparametric Bayes*. (Invited talk)

FocuStat L^n Research Kitchen, Oct 12, 2016, University of Oslo, Norway. *Robust Bayesian inference via coarsening*. (Invited talk)

Pattern Theory Seminar, Oct 5, 2016, Brown University. *Robust Bayesian inference via coarsening*. (Invited talk)

Joint Statistical Meetings (JSM), Aug 3, 2016, Chicago, IL. *Robust Bayesian inference via coarsening*. (Invited talk)

International Society for Bayesian Analysis (ISBA) World Meeting, June 14, 2016, Sardinia, Italy. *Robust Bayesian inference via coarsening*. (Invited talk)

Information Theory and Applications (ITA) Workshop, Feb 3, 2016, La Jolla, CA. *Robust Bayesian inference via coarsening*. (Poster)

8th International Conference of the ERCIM WG on Computational and Methodological Statistics (CM-Statistics 2015), Dec 14, 2015, London, UK. *Robust Bayesian inference via coarsening*. (Invited talk)

Bayesian Nonparametrics: The Next Generation workshop at NIPS, Dec 12, 2015, Montreal, Canada. *Non-standard approaches to nonparametric Bayes*. (Invited talk)

Harvard Statistics Departmental Colloquium, Sept 21, 2015, Harvard University. *Robust Bayesian inference via coarsening*. (Invited talk)

Joint Statistical Meetings (JSM), August 11, 2015, Seattle, WA. *Robust Bayesian inference via coarsening*. (Speed talk, poster)

Bayesian Nonparametrics: Synergies between Statistics, Probability and Mathematics, June 30, 2015, SAMSI. *Robust Bayesian inference via coarsening*. (Poster)

10th Conference on Bayesian Nonparametrics (BNP10), June 23, 2015, Raleigh, NC. *An approach to inference under misspecification*. (Talk)

G70: A Celebration of Alan Gelfand's 70th Birthday, April 20, 2015, Duke University. *The small clustering problem: What if the clusters don't grow with N ?* (Poster)

Texas A&M Statistics Departmental Colloquium, October 31, 2014, Texas A&M University. *Combinatorial stochastic processes for variable-dimension models*. (Invited talk)

International Society for Bayesian Analysis (ISBA) World Meeting, July 14-18, 2014, Cancún, Mexico. *Combinatorial stochastic processes for variable-dimension models*. (Invited talk)

New England Statistics Symposium (NESS), April 25-26, 2014, Harvard School of Public Health. *Combinatorial stochastic processes for variable-dimension models*. (Talk)

Duke Statistical Science Seminar, February 7, 2014, Duke University. *Combinatorial stochastic processes for variable-dimension models*. (Invited talk)

Neural Information Processing Systems (NIPS), December 5-8, 2013, Lake Tahoe, NV. *A simple example of Dirichlet process mixture inconsistency for the number of components*. **Full oral presentation.**

Pattern Theory Seminar, November 6, 2013, Brown University. *Dirichlet process mixture inconsistency for the number of components, and dimension mixture models*. (Invited talk)

REU Seminar (Research Experience for Undergraduates), June 28, 2013, Brown University, Division of Applied Mathematics. *Random matrices with fixed row and column sums*. (Invited talk)

9th Conference on Bayesian Nonparametrics (BNP9), June 10-14, 2013, Amsterdam. *Dimension mixtures of finite-dimensional models*. (Poster) **Winner of 1st place in poster competition.**

New England Machine Learning day (NEML), May 1, 2013, Cambridge, MA. *Posterior consistency for the number of components in a finite mixture*. (Poster)

New England Statistics Symposium (NESS), April 27, 2013, Storrs, CT. *Posterior consistency for the number of components in a finite mixture*. (Poster)

MathSlam, March 22, 2013, Brown University, Division of Applied Mathematics. *Exact sampling and counting for fixed-margin binary matrices*. (Invited talk)

Brown University Symposium for Undergraduates in the Mathematical Sciences (SUMS), March 9, 2013. *High-dimensional parameter spaces and Fisher information*. (Invited talk)

Neural Information Processing Systems (NIPS), Workshop on Modern Nonparametric Methods in Machine Learning, December 3-8, 2012, Lake Tahoe, NV. *Posterior consistency for the number of components in a finite mixture*. (Speed talk, poster)

Graduate Student Statistics Seminar (GSSS), October 12, 2012, Brown University. *Doob's remarkable theorem on posterior consistency*. (Talk)

ICERM Bayesian Nonparametrics Workshop, September 17-21, 2012, Providence, RI. *Dirichlet process mixtures are inconsistent for the number of components in a finite mixture*. (Talk)

New England Statistics Symposium (NESS), April 16, 2011, Storrs, CT. *A practical algorithm for exact inference on tables*. (Talk) **One of four winners of the IBM Student Research Award.**

Joint Statistical Meetings (JSM), July 31-August 5, 2010, Vancouver, BC. *A practical algorithm for exact inference on tables.* (Talk)

PROFESSIONAL DEVELOPMENT AND MEMBERSHIPS

Membership in professional societies: Sigma Xi, ASA, ISBA, AMS, MAA, SIAM.

Sheridan Teaching Certificate I, 2012-2013.

PEER-REVIEW ACTIVITY

Journal of the American Statistical Association, Journal of the Royal Statistical Society: Series B, Journal of Computational and Graphical Statistics, Bayesian Analysis, Statistica Sinica, Canadian Journal of Statistics, Statistics and Computing, Electronic Journal of Statistics, Neural Information Processing Systems (NIPS), Machine Learning, Australasian Combinatorics, SIAM Journal on Discrete Mathematics (SIDMA).

SERVICE

Co-organizer of the Radcliffe exploratory seminar, “Statistics When the Model is Wrong,” 2017-2018. Small workshop with a diverse group of researchers, focused on scalable inference for robustness to model misspecification.

Co-organizer of the Biostatistics – Biomedical Informatics Big Data (B3D) Seminar, 2016-2017. This is a seminar series on statistical, computational, and machine learning methods for analyzing large complex data sets, with a focus on applications in biomedical science and public health. (<https://www.hsph.harvard.edu/biostatistics/b3d-seminar/>)

Co-organizer of the Practical Bayesian Nonparametrics workshop at NIPS 2016. (<https://sites.google.com/site/nipsbnp2016/>)

Departmental committee member:

- Colloquium committee, 2016-2017.
- Master’s of Data Science committee, 2016-2017.
- Dissertation committee for several PhD students.

Founder and organizer of the Graduate Student Seminar for Applied Mathematics, 2012-2014. This is a forum for graduate students from Applied Math and other departments to present and discuss their research.

Co-organizer of the Pattern Theory Group Seminar, 2012-2013. Researchers from Brown and other universities speak about statistics-related topics at this pizza seminar.