

Matthew T. Harrison

Curriculum Vitae

January 28, 2021

1. Name, position, academic department(s)

Matthew T. Harrison
Associate Professor, Division of Applied Mathematics
Brown University

2. Education

B.A. (1998) University of Virginia (Mathematics, Cognitive Science)
Sc.M. (2000) Brown University (Applied Mathematics)
Ph.D. (2005) Brown University (Applied Mathematics)
Dissertation title: *Discovering compositional structures*

3. Professional appointments

Mathematical Sciences Research Institute, Berkeley, CA (January – May 2005)
Postdoctoral member, Mathematical, Computational and Statistical Aspects of Image Analysis
Brown University, Providence, RI (June 2005 – July 2006)
Postdoctoral research associate, Division of Applied Mathematics
Carnegie Mellon University, Pittsburgh, PA (September 2006 – June 2009)
Visiting Assistant Professor, Department of Statistics
Brown University, Providence, RI (July 2009 – June 2016)
Assistant Professor, Division of Applied Mathematics
Brown University, Providence, RI (July 2016 – present)
Associate Professor, Division of Applied Mathematics

4. Completed publications

a. books/monographs

b. chapters in books

- i. M. Harrison, A. Amarasingham, R. Kass (2013) Statistical identification of synchronous spiking. In, *Spike Timing: Mechanisms and Function*. Eds: P. Di Lorenzo, J. Victor. Taylor & Francis, 77-120. (peer reviewed)
- ii. M. Harrison (2015) Significance evaluation. In, *Encyclopedia of Computational Neuroscience*. Eds: D. Jaeger, R. Jung. Springer, 2695-2707. (peer reviewed)

c. refereed journal articles (including refereed conference proceedings)

- i. P. Stockmeyer, C. Bateman, J. Clark, C. Eyster, M. Harrison, N. Loehr, P. Rodriguez, J. Simmons (1995) Exchanging disks in the tower of Hanoi. *International Journal of Computer Mathematics*, 59: 37-47.
- ii. M. Madiman, M. Harrison, I. Kontoyiannis (2004) Minimum description length vs. maximum likelihood in lossy data compression. *Proceedings of the 2004 IEEE International Symposium on Information Theory*.
- iii. M. Harrison, I. Kontoyiannis (2006) On estimating the rate-distortion function. *Proceedings of the 2006 IEEE International Symposium on Information Theory*.
- iv. A. Amarasingham, T.-L. Chen, S. Geman, M. Harrison, D. Sheinberg (2006) Spike count reliability and the Poisson hypothesis. *Journal of Neuroscience*, 26(3): 801-809.
- v. B. Anderson, M. Harrison, D. Sheinberg (2006) A multielectrode study of IT in the monkey: effects of grouping on spike rates and synchrony. *NeuroReport*, 17: 407-411.

- vi. M. Harrison (2008) The generalized asymptotic equipartition property: necessary and sufficient conditions. *IEEE Transactions on Information Theory*, 54: 3211-3216.
- vii. M. Harrison, I. Kontoyiannis (2008) Estimation of the rate-distortion function. *IEEE Transactions on Information Theory*, 54: 3757-3762.
- viii. S. Fujisawa, A. Amarasingham, M. Harrison, G. Buzsaki (2008) Behavior-dependent short-term assembly dynamics in the medial prefrontal cortex. *Nature Neuroscience*, 11: 823-833.
- ix. M. Harrison, S. Geman (2009) A rate and history-preserving resampling algorithm for neural spike trains. *Neural Computation*, 21: 1244-1258.
- x. A. Amarasingham*, M. Harrison*, N. Hatsopoulos, S. Geman (2012) Conditional modeling and the jitter method of spike re-sampling. *Journal of Neurophysiology*, 107: 517- 531. (*equal contribution)
- xi. M. Harrison (2012) Conservative hypothesis tests and confidence intervals using importance sampling. *Biometrika*, 99: 57-69.
- xii. M. Harrison (2013) Accelerated spike resampling for accurate multiple testing controls. *Neural Computation*, 25: 418-449.
- xiii. J. Miller*, M. Harrison (2013) Exact sampling and counting for fixed-margin matrices. *Annals of Statistics*, 41: 1569-1592. (*graduate student)
- xiv. M. Homer*, M. Harrison, M. Black, J. Perge, S. Cash, G. Friehs, L. Hochberg (2013) Mixed decoded cursor velocity and position from an offline Kalman filter improves cursor control in people with tetraplegia. *Proceedings of the 6th International IEEE EMBS Conference on Neural Engineering*. (*graduate student)
- xv. J. Miller*, M. Harrison (2013) A simple example of Dirichlet process mixture inconsistency for the number of components. *Advances in Neural Information Processing Systems (NIPS)*, 26. (*graduate student)
- xvi. M. Homer*, J. Perge, M. Black, M. Harrison, S. Cash, L. Hochberg (2014) Adaptive offset correction for intracortical brain computer interfaces. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 22: 239-248. (*graduate student)
- xvii. W. Truccolo, O. Ahmed, M. Harrison, E. Eskandar, R. Cosgrove, J. Madsen, A. Blum, N.S. Potter, L. Hochberg, S. Cash (2014) Neuronal ensemble synchrony during human focal seizures. *Journal of Neuroscience*, 34: 9927-9944.
- xviii. J. Miller*, M. Harrison (2014) Inconsistency of Pitman-Yor process mixtures for the number of components. *Journal of Machine Learning Research*, 15: 3333-3370. (*graduate student)
- xix. M. Harrison, A. Amarasingham, W. Truccolo (2015) Spatio-temporal conditional inference and hypothesis tests for neural ensemble spiking precision. *Neural Computation*, 27: 104-150.
- xx. A. Amarasingham*, S. Geman, M. Harrison* (2015) Ambiguity and nonidentifiability in the statistical analysis of neural codes. *Proceedings of the National Academy of Sciences*, 112: 6455-6460. (*equal contribution)
- xxi. J. Miller*, M. Harrison (2018) Mixture models with a prior on the number of components. *Journal of the American Statistical Association*, 113(521): 340-356. (*graduate student)
- xxii. D. Brandman*, T. Hosman, J. Saab, M. Burkhart, B. Shanahan, J. Ciancibello, A. Sarma, D. Milstein, C. Vargas-Irwin, B. Franco, J. Kelemen, C. Blabe, B. Murphy, D. Young, F. Willett, C. Pandarinath, S. Stavisky, R. Kirsch, B. Walter, B. Ajiboye, S. Cash, E. Eskandar, J. Miller, J. Sweet, K. Shenoy, J. Henderson, B. Jarosiewicz, M. Harrison, J. Simeral, L. Hochberg (2018) Rapid calibration of an intracortical brain computer interface for people with tetraplegia. *Journal of Neural Engineering*, 15: 026007. (*graduate student)

- xxiii. D. Brandman*, M. Burkhart*, J. Kelemen, B. Franco, M. Harrison, L. Hochberg. (2018) Robust Closed-Loop Control of a Cursor in a Person with Tetraplegia using Gaussian Process Regression. *Neural Computation*, 30: 2986-3008. (*graduate student)
- xxiv. J. Winbourne, M. Harrison, B. Sullivan, S. Alvarez-Clares, S. Lins, L. Martinelli, M. Nasto, D. Piotta, S. Rolim, M. Wong, S. Porder (2018) A New Framework for Evaluating Estimates of Symbiotic Nitrogen Fixation in Forests. *The American Naturalist*, 192: 618-629.
- xxv. M. Ott*, M. Harrison, K. Gile, N. Barnett, J. Hogan (2019) Fixed choice design and augmented fixed choice design for network data with missing observations. *Biostatistics*, 20: 97-110. (*graduate student)
- xxvi. M. Ott*, K. Gile, M. Harrison, L. Johnston, J. Hogan (2019). Reduced bias for respondent-driven sampling: accounting for non-uniform edge sampling probabilities in people who inject drugs in Mauritius. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 68(5): 1411-1429. (*graduate student)
- xxvii. M. Burkhart*, D. Brandman*, B. Franco, L. Hochberg, M. Harrison (2020). The discriminative Kalman filter for Bayesian filtering with nonlinear and non-Gaussian observation models. *Neural Computation*, 32(5): 969-1017. (*graduate student)
- xxviii. A. Singleton*, B. Marshall, S. Bessey, M. Harrison, A. Galvani, J. Yedinak, B. Jacka, S. Goodreau, W. Goedel (2021) Network structure and rapid HIV transmission among people who inject drugs in Indiana: A simulation-based analysis. *Epidemics*, 34. (*undergraduate student)
- d. non-refereed journal articles** (including non-refereed conference proceedings)
 - i. N. Hatsopoulos, M. Harrison, J. Donoghue (2001) Representations based on neuronal interactions in motor cortex. *Progress in Brain Research*, 130: 233-244.
 - ii. M. Harrison, I. Kontoyiannis (2002) Maximum likelihood estimation for lossy data compression. *Proceedings of the 40th Allerton Conference on Communication, Control and Computing*.
 - iii. J. Miller*, M. Harrison (2010) A practical algorithm for exact inference on tables. *Proceedings of the 2010 Joint Statistical Meeting*. (*graduate student)
 - iv. R. Kass, S. Amari, K. Arai, E. Brown, C. Diekmann, M. Diesmann, B. Doiron, U. Eden, A. Fairhall, G. Fiddymant, T. Fukai, S. Grün, M. Harrison, M. Helias, H. Nakahara, J. Teramae, P. Thomas, M. Reimers, J. Rodu, H. Rotstein, E. Shea-Brown, H. Shimazaki, S. Shinomoto, B. Yu, M. Kramer (2018) Computational Neuroscience: Mathematical and Statistical Perspectives. *Annual Review of Statistics and Its Application*, 5:183-214.
- e. book reviews**
- f. abstracts**
 - i. A. Amarasingham, T.-L. Chen, S. Geman, M. Harrison, D. Sheinberg (2003) Spike count variability and the Poisson hypothesis. *Annual Computational Neuroscience Meeting (CNS)*. Alicante, Spain.
 - ii. M. Harrison, S. Geman (2004) Compositional feature detectors. *SIAM 2004 Conference on Imaging Science*. Salt Lake City, UT.
 - iii. M. Harrison (2005) Unsupervised learning of invariances using video. *MSRI Workshop on Visual Recognition*. Berkeley, CA
 - iv. M. Harrison (2005) Compositionality. *MSRI Emphasis Week on Perceptual Organization*. Berkeley, CA.
 - v. A. Amarasingham, M. Harrison, S. Geman (2005) Statistical techniques for analyzing non-repeating spike trains. *Annual Society for Neuroscience Meeting (SFN) 2005*. Washington, DC.
 - vi. B. Anderson, M. Harrison, D. Sheinberg (2006) Neuronal synchrony and visual grouping: A multi-electrode study in monkey IT. *Journal of Vision*, 6(6):65, 65a.

- vii. A. Amarasingham, M. Harrison, S. Geman (2006) Statistical analysis of neuronal firing patterns with non-repeatable trials. *Third Workshop on Statistical Analysis of Neuronal Data (SAND3)*. Pittsburgh, PA.
- viii. M. Harrison, A. Amarasingham, S. Geman (2006) Statistical methods for non-repeatable observations in neuroscience. *ICSA 2006 Applied Statistics Symposium*. Storrs, CT.
- ix. A. Amarasingham, M. Harrison, S. Geman (2007) Jitter methods for investigating spike train dependencies. *Computational and Systems Neuroscience (COSYNE) 2007*. Salt Lake City, UT.
- x. M. Harrison, A. Amarasingham, S. Geman (2007) Jitter methods for investigating the time scale of dependencies in neuronal firing patterns. *2007 Joint Statistical Meeting (JSM)*. Salt Lake City, UT.
- xi. Amarasingham, M. Harrison, G. Buzsaki (2008) Resampling techniques for the statistical investigation of neurophysiological data. *Computational and Systems Neuroscience (COSYNE) 2008*. Salt Lake City, UT.
- xii. M. Harrison, A. Amarasingham, G. Buzsaki (2008) Resampling-based methods for multiple hypothesis testing in neurophysiological data. *Fourth International Workshop on Statistical Analysis of Neuronal Data (SAND4)*. Pittsburgh, PA.
- xiii. M. Harrison, A. Amarasingham (2010) Multi-scale multiple hypothesis testing for spike trains. *Eastern North American Region/International Biometric Society (ENAR) 2010 Spring Meeting*. New Orleans, LA.
- xiv. M. Harrison (2010) Multi-scale multiple hypothesis testing for spike trains. *New England Statistics Symposium 2010*. Boston, MA.
- xv. J. Miller, M. Harrison (2011) A practical algorithm for exact inference on tables. *New England Statistics Symposium 2011*. Storrs, CT.
- xvi. M. Harrison (2011) Importance sampling for accelerated multiple testing and confidence intervals. *New England Statistics Symposium 2011*. Storrs, CT.
- xvii. S. Ramachandran, D. Nadkarni, M. Harrison (2011) Detecting gene flow with low-dimensional summaries of genotype data. *Society of Molecular Biology and Evolution 2011 Annual Meeting*. Kyoto, Japan.
- xviii. M. Harrison, S. Geman (2011) Learning the network structure of cortical microcircuits. *Institute for Mathematics and its Applications (IMA) Workshop on Large Graphs: Modeling, Algorithms and Applications*. Minneapolis, MN.
- xix. M. Harrison (2012) Incidental parameter problems arising from the analysis of nonstationary neural point processes. *New England Statistics Symposium 2012*. Boston, MA.
- xx. M. Homer, J. Perge, M. Harrison, M. Black, L. Hochberg (2012) Detecting neural signal nonstationarities in intracortical brain computer interfaces using a model selection method. *Sixth International Workshop on Statistical Analysis of Neuronal Data (SAND6)*. Pittsburgh, PA.
- xxi. M. Harrison (2012) Learning the Network Structure of Cortical Microcircuits using Conditional Inference. *8th World Congress in Probability and Statistics*. Istanbul, Turkey.
- xxii. M. Harrison (2012) Conditional Inference for Learning the Network Structure of Cortical Microcircuits. *2012 Joint Statistical Meeting (JSM)*. San Diego, CA.
- xxiii. J. Miller, M. Harrison (2012) Dirichlet process mixtures are inconsistent for the number of components in a finite mixture. *ICERM Bayesian Nonparametrics Workshop*. Providence, RI.
- xxiv. M. Homer, J. Perge, M. Harrison, M. Black, L. Hochberg (2012) Characterizing neural signal nonstationarities during operation of an intracortical brain computer interface by people with tetraplegia. *Annual Society for Neuroscience Meeting (SFN) 2012*. New Orleans, LA.

- xxv. M. Homer, J. Perge, M. Harrison, M. Black, L. Hochberg (2012) A method for determining neural signal contributions to Kalman filter based decoding in intracortical brain computer interfaces. *Biomedical Engineering Society Annual Meeting (BMES) 2012*. Atlanta, GA.
- xxvi. D. Nadkarni, M. Harrison (2012) The incidental parameter problem in network analysis for neural spiking data. *2012 Women in Machine Learning Workshop*. Lake Tahoe, NV.
- xxvii. J. Miller, M. Harrison (2012) Posterior consistency for the number of components in a finite mixture. *2012 NIPS Workshop on Modern Nonparametric Machine Learning*. Lake Tahoe, NV.
- xxviii. D. Klein, M. Harrison (2013) Conditional inference for edge covariate effects in sparse networks. *2013 New England Statistics Symposium*. Storrs, CT.
- xxix. J. Miller, M. Harrison (2013) Nonparametric Bayesian inference for the number of components in a finite mixture. *2013 New England Statistics Symposium*. Storrs, CT.
- xxx. D. Nadkarni, M. Harrison (2013) Conditional inference for network analysis for neural spiking data: zero-lag synchrony. *2013 New England Statistics Symposium*. Storrs, CT.
- xxxi. J. Miller, M. Harrison (2013) Posterior consistency for the number of components in a finite mixture. *2013 New England Machine Learning Day*. Cambridge, MA.
- xxxii. D. Nadkarni, M. Harrison (2013) The incidental parameter problem in network analysis for neural spiking data. *2013 New England Machine Learning Day*. Cambridge, MA.
- xxxiii. M. Harrison (2013) Robust inference for nonstationary spike trains. *Workshop: Quantifying Structure in Large Neural Datasets*. Grossman Center for the Statistics of Mind, Columbia University. New York, NY.
- xxxiv. M. Homer, M. Harrison, J. Perge, J. Simeral, L. Hochberg (2013) Decoding of target proximity improves estimation of attempted movement in people with tetraplegia. *2013 Society for Neuroscience Annual Meeting*. San Diego, CA.
- xxxv. W. Truccolo, O. Ahmed, M. Harrison, E. Eskandar, G. Cosgrove, J. Madsen, A. Blum, N. Potter, L. Hochberg, S. Cash (2013) Neuronal spiking synchrony in human focal seizures. *2013 Society for Neuroscience Annual Meeting*. San Diego, CA.
- xxxvi. D. Klein, M. Harrison (2014) Asymptotics of logistic regression with a bounded number of positive outcomes. *2014 New England Statistics Symposium*. Boston, MA.
- xxxvii. J. Miller, M. Harrison (2014) Combinatorial stochastic processes for variable-dimension models. *2014 New England Statistics Symposium*. Boston, MA.
- xxxviii. M. Harrison (2014) Robust inference for nonstationary spike trains. *2014 Statistical Society of Canada Annual Meeting*. Toronto, Canada.
- xxxix. M. Ott, K. Gile, J. Hogan, M. Harrison (2014) Edge sampling probabilities in respondent-driven sampling. *2014 Joint Statistical Meetings (JSM)*. Boston, MA.
- xl. M. Harrison, A. Amarasingham, W. Truccolo (2014) Robust inference for nonstationary spike trains. *2014 CRCNS PI Meeting*. Phoenix, AZ.
- xli. M. Harrison, A. Amarasingham, D. Nadkarni (2015) Robust inference for nonstationary spike trains. *2015 CRCNS PI Meeting*. Seattle, WA.
- xlii. D. Brandman, M. Burkhart, D. Milstein, J. Saab, T. Hosman, A. Sarma, B. Franco, C. Blabe, J. Henderson, K. Shenoy, J. Donoghue, M. Harrison, L. Hochberg (2016) Closed loop intracortical brain computer interface control using Gaussian processes in a nonlinear, discriminative version of the Kalman filter. *9th World Congress for Neurorehabilitation*. Philadelphia, PA.
- xliii. I. Petrovic, L. Roux, G. Buzsaki, M. Harrison (2016) Nonparametric inference of neural response with exact simultaneous confidence bands. *30th New England Statistics Symposium*. New Haven, CT.
- xliv. D. Brandman, M. Burkhart, D. Milstein, J. Saab, T. Hosman, A. Sarma, F. Franco, J. Donoghue, M. Harrison, L. Hochberg (2016) Intracortical brain computer interface

- control using Gaussian processes. *Dalhousie University Surgery Research Day*, Halifax, NS.
- xliv. M. Burkhart, D. Brandman, C. Vargas-Irwin, M. Harrison (2016) Nonparametric discriminative filtering for neural decoding. *ICSA Applied Statistics Symposium*, Atlanta, GA.
 - xlvi. M. Ott, J. Hogan, N. Barnett, K. Gile, M. Harrison (2016) Fixed Choice Design and Augmented Fixed Choice Design for Missing Data in Social Networks. *2016 Joint Statistical Meetings (JSM)*. Chicago, IL.
 - xlvii. M. Burkhart, D. Brandman, C. Vargas-Irwin, & M. Harrison (2016). Nonparametric discriminative filtering for neural decoding. *Machine Learning Summer School*, Arequipa, Peru.
 - xlviii. D. Brandman, M. Burkhart, D. Milstein, J. Saab, T. Hosman, A. Sarma, B. Franco, J. Donoghue, M. Harrison, L. Hochberg (2016) Closed Loop Intracortical Brain Computer Interface Control in a Person with ALS Using a Filtered Gaussian Process Decoder. *American Neurological Assoc. Annual Meeting*, Baltimore, MD.
 - xliv. D. Brandman, M. Burkhart, T. Hosman, J. Saab, A. Sarma, D. Milstein, C. Vargas-Irwin, B. Franco, J. Donoghue, M. Harrison, L. Hochberg (2016) Closed loop intracortical brain computer interface cursor control in people using a continuously updating Gaussian process decoder. *Society for Neuroscience*, San Diego, CA.
 - i. M. Burkhart, D. Brandman, M. Harrison (2017). The discriminative Kalman filter for nonlinear and non-Gaussian sequential Bayesian filtering. *The 31st New England Statistics Symposium*, Storrs, CT.
 - li. D Brandman, M Burkhart, J Saab, T Hosman, B Franco, J Kelemen, M Harrison, L Hochberg (2017) Noise-robust closed-loop neural decoding using an intracortical brain computer interface in a person with paralysis. *Society for Neuroscience*, Washington, DC.
 - lii. D. Brandman, M. Harrison, L. Hochberg (2019) Rapidly calibrating intracortical brain computer interfaces in people with paralysis. *Dalhousie University Clinical Neuroscience Meeting*, Halifax, NS. [won "Best Neurosurgical Research Presentation" (D. Brandman)]
 - liii. A. Singleton, B. Marshall, M. Harrison, S. Goodreau, W. Goedel. (2019) Structural network characteristics and vulnerability to rapid HIV transmission among people who inject drugs in a rural county in the United States: A modelling study. *7th International Conference on Infectious Disease Dynamics*, Charleston, SC.
- g. invited lectures**
- i. Brown University, Brain Sciences Program, November 2005
 - ii. Brown University, Division of Applied Mathematics, January 2006
 - iii. Carnegie Mellon University, Department of Statistics, February 2006
 - iv. Center for the Neural Basis of Cognition Annual Retreat, October 2008
 - v. Yale University, Department of Statistics, December 2008
 - vi. Lehigh University, Department of Mathematics, January 2009
 - vii. University of Pennsylvania, Department of Statistics, January 2009
 - viii. University of California Berkeley, Department of Statistics, February 2009
 - ix. Brown University, Division of Applied Mathematics, February 2009
 - x. University of Virginia, Department of Statistics, February 2009
 - xi. University of Florida, Department of Statistics, February 2009
 - xii. West Virginia University, Department of Statistics, February 2009
 - xiii. Sandia National Laboratories, February 2009
 - xiv. University of Connecticut, Department of Statistics, November 2009
 - xv. Boston University, Department of Mathematics & Statistics, April 2010
 - xvi. University of Massachusetts Amherst, Department of Mathematics & Statistics, October 2010

- xvii. Columbia University, Center for Theoretical Neuroscience, January 2012
- xviii. Columbia University, Student Statistics Seminar, February 2013
- xix. Boston University, Department of Mathematics & Statistics, December 2013
- xx. Florida State University, Department of Statistics, April 2014
- xxi. New York University, Buzsaki Laboratory, September 2014
- xxii. Statistical and Applied Mathematical Sciences Institute (SAMSI), August 2015
- xxiii. Worcester Polytechnic Institute, Department of Mathematical Sciences, April 2019
- xxiv. Harvard University, Department of Biostatistics, April 2019
- xxv. Carnegie Mellon University, Department of Statistics, December 2019

h. papers read

i. work(s) in review

- i. M. Harrison, J. Miller (in revision) Importance sampling for weighted random binary matrices with specified margins. arXiv:1301.3928.

j. work(s) in progress

- i. S. Geman, J. Loper, M. Harrison (in preparation) Modern applications of probability and statistics [textbook].
- ii. L. Paninski, U. Eden, R. Kass, M. Harrison (in preparation) [book about statistical neuroscience]

5. Service

a. to the University

- i. affiliated faculty: Brown Center for Statistical Sciences, Brown Center for Vision Research, Carney Institute for Brain Sciences, Brown Initiative in Computation in Brain and Mind, Brown NIH COBRE Center for Central Nervous System Function, Brown Data Science Initiative
- ii. organizer of weekly departmental pattern theory seminar (2009 – 2017, 2018 – 2020) <http://www.dam.brown.edu/ptg/seminar.html>
- iii. Sheridan Center Faculty Liaison to department (2010 – 2012)
- iv. participant in departmental recommendations of library purchases (2011 – 2012)
- v. departmental liaison for AMDUG, STEM and undergraduate events (2013 – 2017)
- vi. departmental MathSlam coordinator (2016 – 2017)
- vii. faculty speaker for Applied Mathematics Departmental Undergraduate Group (2009, 2014)
- viii. departmental Prager assistant professor search committee member (2016/17)
- ix. Brown IMSD Internal Advisory Board member (2016 – present)
- x. TEAM: Team Enhanced Advising and Mentoring participant (2016/17)
- xi. First-Year advisor (2016/17, 2020/21)
- xii. Sophomore advisor (2017/18)
- xiii. Brown SIAM Student Chapter, invited panelist (2017)
- xiv. Carney Institute for Brain Science Executive Committee member (2017 – present)
- xv. departmental tenure and promotion committee member for Biostatistics candidate (2017)
- xvi. Concentration advisor (2018 – present)
- xvii. judge for the Young Scholars Conference Poster Session (2018)
- xviii. Brown University Community Council (2018 – present)
- xix. speaker at Brown's *Building on Distinction* lecture series about Decoding the Human Brain with Data (2018)
- xx. departmental committee on support for graduate students (2018/19)
- xxi. departmental tenure and promotion committee member (2019)
- xxii. departmental Prager assistant professor search committee chair (2019/20)

- xxiii. Carney Institute for Brain Science open rank search committee member (2019/20)
- xxiv. departmental Director of Undergraduate Studies (2020 – present)

b. to the profession

- i. current and previous professional memberships: AMS, SIAM, SFN, IMS, IEEE, ASA
- ii. ad hoc reviewer for: The American Statistician, Annals of Applied Statistics, Annals of Statistics, Biometrics, Computation and Systems Neuroscience (COSYNE), Encyclopedia of Computational Neuroscience, Electronic Journal of Statistics, Entropy, European Conference on Computer Vision (ECCV), Frontiers in Computational Neuroscience, IEEE Information Theory Workshop (ITW), IEEE International Symposium on Information Theory (ISIT), IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, International Conference on Computer Vision and Pattern Recognition (CVPR), Journal of the American Statistical Association, Journal of Complex Networks, Journal of Computational Graphical Statistics, Journal of Computational Neuroscience, Journal of Computational Physics, Journal of Computational Statistics and Data Analysis, Journal of Neurophysiology, Journal of Neuroscience Methods, Journal of Neural Engineering, Journal of the Royal Statistical Society, Neural Computation, Neural Information Processing Systems (NeurIPS), Neural Systems & Circuits, Neuron, PLoS Computational Biology, Proceedings of the National Academy of Science, Quarterly of Applied Mathematics, Science, SIAM Journal on Imaging Sciences, Statistica Sinica, Statistical Analysis and Data Mining, Statistics and Probability Letters
- iii. invited session organizer, Statistical Methods in Neuroscience, 8th World Congress on Probability and Statistics, Istanbul, Turkey (2012)
- iv. co-chair, organizing committee, Bayesian Nonparametrics Workshop, Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI (2012)
- v. US National Science Foundation (NSF) research proposal panelist (2014, 2015, 2016, 2017), ad hoc reviewer (2016)
- vi. senior program committee member, AISTATS (2017)
- vii. organizer for the CRCNS 2017 PI-meeting, Providence, RI (2017)
- viii. organizing committee member, SAND9, Pittsburgh, PA (2019)
- ix. area chair, ICML (2020)

c. to the community

- i. presenter at the MSRI / MAA PREP (Professional Enhancement Program for undergraduate instructors) Workshop on the Mathematics of Images, Berkeley, CA (2005)
- ii. volunteer teacher, 11th grade algebra program, “The Met” High School, Providence, RI (2005–2006)
- iii. instructor of Community College of Rhode Island mathematics courses within Rhode Island Adult Correctional Institutes (2012 – present) and organizer of program to allow Brown graduate students to co-teach these courses (2013 – present)
- iv. presenter for the Johns Hopkins Center for Talented Youth: Gifted and Talented Programs (2016, 2019)
- v. various general audience research presentations (RI Adult Correctional Institute, “The Met” High School, etc)

6. Academic honors, fellowships, and honorary societies

- Phi Beta Kappa, University of Virginia (1997)
- Jefferson Scholarship, University of Virginia (1994-1998)
- Howard Hughes Medical Institute Predoctoral Fellowship in Biological Sciences Awardee (1998)

- National Defense Science and Engineering Graduate Fellowship (1998-2001)
- The manuscript associated with abstract 5.f.xv above won an IBM Thomas J. Watson Research Center Student Research Award for my student Jeffrey Miller.
- The manuscript 5.c.xv above was one of 40 papers out of 1420 submissions selected for a full oral presentation at N(eur)IPS 2013.
- Philip J. Bray Award for Excellence in Teaching in the Physical Sciences (2014)