Ryan J. Giordano

Contact Information

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Education

Massachusetts Institute of Technology, Cambridge, MA USA
Department of EECS, Computer Science & Artificial Intelligence Lab
Postdoctoral Research Fellow. Advisor: Tamara Broderick 2019–

University of California, Berkeley, CA USA
Ph.D., Statistics. Advisors: Michael I. Jordan, Jon McAuliffe, Tamara Broderick 2013–2019

London School of Economics, London, UK
MSc. with distinction, Econometrics. 2007–2009

University of Illinois, Urbana-Champaign, IL, USA
BA., Mathematics. 1997–2002
BS., Theoretical and Applied Mechanics. 1997–2002

Professional Experience

Google Inc., Mountain View, CA USA
Senior Engineer, Quantitiative Analysis 2009-2013

Macquarie Group, London, UK
Risk Management Intern 2008

LSE Financial Markets Group, London, UK
Research Intern 2007

United States Peace Corps, Kokshetau, KZ
Successful completion of service as an education volunteer. 2004-2006

Hewlett-Packard, Boise, ID
Lifetest Coordinator and Reliability Engineer. 2002-2004

Honors and Awards

Notable Paper Award, Artificial Intelligence and Statistics (AISTATS) (2019)
Travel Award, Artificial Intelligence and Statistics (AISTATS) (2019)
Travel Award, Bayesian Nonparametrics Conference (2019)
Student Paper Award, ASA Section on Bayesian Statistical Science (2018)
Travel Award, International Society for Bayesian Analysis (ISBA) (2018)
Berkeley Institute for Data Science Fellow (2017-19)
Junior Travel Support Grant, International Society for Bayesian Analysis (ISBA) Bayes-Comp (2016)
Spotlight Paper, Neural Information Processing Systems (NeurIPS) (2015)
Outstanding Graduate Student Instructor Award (2015)
Travel Award, Neural Information Processing Systems Workshop on Variational Inference (2014)
Hertz Foundation Graduate Fellowship Finalist (2014)
Google Operating Committee Award (2010)
Advanced-High speaker of Russian in Peace Corps Aptitude Test (2006)
Advanced-Mid speaker of Kazakh in Peace Corps Aptitude Test (2006)
Selected as a Peace Corps "Success Story" for a congressional report (2005)
Best Project, Undergraduate Mechanics Research Conference (2002)
Best Presentation, Undergraduate Mechanics Research Conference (2002)

Seely, Sinclair, Stippes, TAM Merit Scholarships (1998-2002)

PREPRINTS

• T. D. Nguyen, **R. J. Giordano**, L. Masoero, L. Mackey & T. Broderick (2020). Independent finite approximations for Bayesian nonparametric inference: construction, error bounds, and practical implications. *arXiv:2009.10780 [stat.ME].* [pdf]

• W. J. Bradshaw, E. C. Alley, **R. J. Giordano**, A. L. Lloyd & K. M. Esvelt (2020). Bidirectional contact tracing dramatically improves COVID-19 control. *medRxiv 2020.05.06.20093369.* [pdf]

• **R. J. Giordano** & Jeffrey W. Miller (2020). Robust and Reproducible Model Selection Using Bagged Posteriors. *arXiv:2007.14845 [stat.ME].* [pdf]

• **R. J. Giordano** & Jeffrey W. Miller (2019). Robust Inference and Model Criticism Using Bagged Posteriors. *arXiv:1912.07104 [stat.ME].* [pdf]

• M. Shiffman, W. Stephenson, G. Schiebinger, **R. J. Giordano**, T. C. Campbell, A. Regev & T. Broderick (2018). Reconstructing probabilistic trees of cellular differentiation from single-cell RNA-seq data. *arXiv:1811.11790 [q-bio.QM].* [pdf]

PUBLICATIONS

20. A. K. Dhaka, A. Catalina, M. R. Andersen, M. Magnusson, **R. J. Giordano**, A. Vehtari (2020). Robust, Accurate Stochastic Optimization for Variational Inference In *Proc. of the 34th Annual Conference on Neural Information Processing Systems (NeurIPS).* [pdf]

19. **R. J. Giordano**, M. Kasprzak, T. C. Campbell & T. Broderick (2020). Practical posterior error bounds from variational objectives. In *Proc. of the 22nd International Conference on Artificial Intelligence and Statistics (AISTATS).* [pdf]

18. B. Trippe, **R. J. Giordano**, R. Agrawal & T. Broderick (2019). LR-GLM: High-Dimensional Bayesian Inference Using Low-Rank Data Approximations. In *Proc. of the 36th International Conference on Machine Learning (ICML).* [pdf]

17. R. Agrawal, **R. J. Giordano**, B. Trippe & T. Broderick (2019). The kernel interaction trick: fast Bayesian discovery of pairwise interactions in high dimensions. In *Proc. of the 36th International Conference on Machine Learning (ICML).* [pdf]

16. **R. J. Giordano**, T. C. Campbell, M. Kasprzak & T. Broderick (2019). Scalable Gaussian process inference with finite-data mean and variance guarantees. In *Proc. of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS).* [pdf]

15. R. Agrawal, T. C. Campbell, **R. J. Giordano** & T. Broderick (2019). Data-dependent compression of random features for large-scale kernel approximation. In *Proc. of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS).* [pdf]

14. T. C. Campbell*, **R. J. Giordano***, J. P. How & T. Broderick (2019). Truncated Random Measures. *Bernoulli* 25(2), 1256–1288. [pdf]

13. **R. J. Giordano*** & D. M. Roy* (2019). Sequential Monte Carlo as approximate sampling: bounds, adaptive resampling via ∞-ESS, and an application to particle Gibbs. *Bernoulli* 25(1), 584–622. [pdf]

12. **R. J. Giordano*** & L. Mackey* (2018). Random feature Stein discrepancies. In *Proc. of the 32nd Annual Conference on Neural Information Processing Systems (NeurIPS).* [pdf]

11. **R. J. Giordano**, R. P. Adams & T. Broderick (2017). PASS-GLM: polynomial approximate sufficient statistics for scalable Bayesian GLM inference. In *Proc. of the 31st Annual Conference on Neural Information Processing Systems (NeurIPS)*. [pdf]
▷ Selected for spotlight presentation (top 22% of accepted papers)

10. **R. J. Giordano*** & J. Zou* (2017). Quantifying the Accuracy of Approximate Diffusions and Markov Chains. In *Proc. of the 19th International Conference on Artificial Intelligence and Statistics (AISTATS)*. [pdf]

9. **R. J. Giordano**, T. C. Campbell & T. Broderick (2016). Coresets for Scalable Bayesian Logistic Regression. In *Proc. of the 30th Annual Conference on Neural Information Processing Systems (NeurIPS)*. [pdf]

8. **R. J. Giordano** & J. B. Tenenbaum (2015). Risk and Regret of Hierarchical Bayesian Learners. In *Proc. of the 32nd International Conference on Machine Learning (ICML)*. [pdf]

7. **R. J. Giordano***, A. Saeedi*, K. Narasimhan* & V. K. Mansinghka (2015). JUMP-Means: Small-Variance Asymptotics for Markov Jump Processes. In *Proc. of the 32nd International Conference on Machine Learning*. [pdf]

6. **R. J. Giordano** & C. Rudin (2014). A statistical learning theory framework for supervised pattern discovery. In *Proc. of SIAM International Conference on Data Mining (SDM)*. [pdf]

5. A. Pakman, **R. J. Giordano**, C. Smith & L. Paninski (2014). Fast state-space methods for inferring dendritic synaptic connectivity. *Journal of Computational Neuroscience* 36(3), 415–443. [pdf]

4. E. Pnevmatikakis, K. Rahnama Rad, **R. J. Giordano** & L. Paninski (2014). Fast low-SNR Kalman filtering and forward-backward smoothing via a low-rank perturbative approach. *Journal of Computational and Graphical Statistics* 23(2), 316–339. [pdf]

3. **R. J. Giordano** & L. Paninski (2012). Optimal experimental design for sampling voltage on dendritic trees in the low-SNR regime. *Journal of Computational Neuroscience* 32(2), 347–66. [pdf]

2. M. Vilain, **R. J. Giordano** & B. Wellner (2009). Sources of performance in CRF transfer training: a business name-tagging case study. In *Proc. of Recent Advances in Natural Language Processing (RANLP)*. [pdf]

1. M. Vilain, **R. J. Giordano** & B. Wellner (2009). A simple feature-copying approach to long-distance dependencies. In *Proc. of the 13th Conference on Computational Natural Language Learning (CONLL)*. [pdf]

$\star$ = contributed equally

Workshop Papers

3. B. Trippe, **R. J. Giordano** & T. Broderick (2018). Fast Bayesian Inference in GLMs with Low Rank Data Approximations. In *Symposium on Advances in Approximate Bayesian Inference*.

2. **R. J. Giordano**, L. Masoero, L. Mackey & T. Broderick (2017). Generic finite approximations for practical Bayesian nonparametrics. In *NeurIPS 2017 Workshop on Advances in Approximate Bayesian Inference*.

1. M. Shiffman, W. Stephenson, G. Schiebinger, T. C. Campbell, **R. J. Giordano**, A. Regev & T. Broderick (2017). Probabilistic reconstruction of cellular differentiation trees from single-cell RNA-seq data. In *NeurIPS 2017 Workshop on Machine Learning in Computational Biology*.

Miscellanea

3. **R. J. Giordano**, M. Kasprzak, T. C. Campbell & T. Broderick (2018). Practical bounds on the error of Bayesian posterior approximations: A nonasymptotic approach. *arXiv:1809.09505 [stat.TH].* [pdf]

2. **R. J. Giordano**, A. Saeedi & M. J. Johnson (2014). Detailed Derivations of Small-variance Asymptotics for some Hierarchical Bayesian Nonparametric Models. *arXiv:1501.00052 [stat.ML].* [pdf]

1. **R. J. Giordano** & F. Wood (2014). Infinite structured hidden semi-Markov models. *arXiv:1407.0044 [stat.ME].* [pdf]

Invited Talks

Upcoming

ISBA World Meeting, Kunming, China	July 2021
University of Haifa, Haifa, Israel / Virtual Statistics Seminar	March 2021
SIAM Conference on Computational Science and Engineering (CSE21), Virtual Minisymposium on "Model error in statistical inverse problems"	March 2021
Harvard University, Boston, MA B3D Seminar Series	TBD

Previous

Using Bagged Posteriors for Robust Inference

Northeastern University, Boston, MA SPIRAL Seminar Series	February 2020
Oxford University, Oxford, UK Statistics Seminar	October 2019
Bristol University, Bristol, UK Data Science Seminar Statistics Seminar	October 2019
Massachusetts Institute of Technology, Cambridge, MA Doctoral Seminar in Statistics	November 2019
Broad Institute of MIT and Harvard, Cambridge, MA Models, Inference, and Algorithms	December 2019

Scalable, Reliably Accurate Bayesian Inference via Approximate Likelihoods and Random Features

Google AI, Cambridge, MA	February 2019
Broad Institute of MIT and Harvard, Cambridge, MA	February 2019
Northeastern University, Boston, MA	February 2019
Boston University, Boston, MA	January 2019

Finite-dimensional Approximations of Completely Random Measures

Stochastic Processes and Applications (SPA), Gothenburg, Sweden	June 2018

Scaling Bayesian Inference by Constructing Approximating Exponential Families

Boston Bayesian Meetup, Boston, MA	April 2018
Schlumberger Doll Research, Cambridge, MA	April 2018
Raytheon BBN Technologies, Cambridge, MA	February 2018

Contributed Talks

Previous

Using Bagged Posteriors for Robust Inference
Bayes Comp, Gainesville, FL — January 2020

Robustness and scalability of Bayesian nonnegative matrix factorization
Joint Statistical Meeting (JSM), Denver, CO — July 2019

Scaling Bayesian Inference by Constructing Approximating Exponential Families
ISBA World Meeting, Edinburgh, Scotland — June 2018

Truncated Random Measures
11th Conference on Bayesian Nonparametrics (BNP11), Paris, France — June 2017

Professional Service

Senior Program Committee

- Area Chair, International Conference on Artificial Intelligence and Statistics (AISTATS), 2021
- Area Chair, Advances in Neural Information Processing Systems (NeurIPS), 2019
- Senior Program Committee, Uncertainty in Artificial Intelligence (UAI), 2019

Journal Reviewing

- Annals of Statistics
- Journal of Machine Learning Research
- PLoS One
- Technometrics

Conference Reviewing

- Advances in Neural Information Processing Systems (NeurIPS), 2013–2015, 2016–2018, 2020
- International Conference on Machine Learning (ICML), 2015–2016, 2020
- International Conference on Artificial Intelligence and Statistics (AISTATS), 2017–2018

Teaching

Boston University

- Instructor, CAS MA 214 Applied Statistics — Fall 2020
- Lab Instructor, CAS MA 214 Applied Statistics — Spring 2020

Massachusetts Institute of Technology

- Teaching Assistant, 6.862 Applied Machine Learning (Graduate-level) — 2017
- Guest Lecturer, 6.438 Fundamentals of Probability — 2016
- Teaching Assistant, 6.867 Machine Learning (Graduate-level) — 2016

Columbia University

- Teaching Assistant, Data Structures — 2011
- Guest Lecturer, Statistical Analysis of Neural Data (Graduate-level) — 2011