Jonathan H. Huggins

Contact Information

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Education

Massachusetts Institute of Technology, Cambridge, MA USA
Ph.D., Computer Science. Advisor: Tamara Broderick — 2014 - 2018
S.M., Computer Science. Advisor: Joshua B. Tenenbaum — 2012 - 2014

Columbia University, Columbia College, New York, NY USA
B.A., Mathematics. Advisors: Liam Paninski and Frank D. Wood — 2008 - 2012

Academic Experience

Harvard University, Department of Biostatistics, Boston, MA USA
Postdoctoral Research Fellow. Advisor: Jeffrey Miller — 2018 -

Microsoft Research New England, Cambridge, MA USA
Research Intern. Advisor: Lester Mackey — 2017

Honors and Awards

ISBA@NeurIPS travel award (2016)
DoD National Defense Science and Engineering Graduate Fellowship (2013-2015)
NSF Graduate Research Fellowship (2013) *(declined for DoD NDSEG)*
Hertz Fellowship Finalist (2013)
Summa Cum Laude, Columbia University (2012)
Phi Beta Kappa (2011)
Rabi Scholar, Columbia College (2008-2012)
Intel Science Talent Search Finalist (2008)

Preprints

- M. Shiffman, W. Stephenson, G. Schiebinger, **J. H. Huggins**, T. C. Campbell, A. Regev & T. Broderick. Reconstructing probabilistic trees of cellular differentiation from single-cell RNA-seq data. *aarXiv:1811.11790 [q-bio.QM].*

- **J. H. Huggins**, M. Kasprzak, T. C. Campbell & T. Broderick. Practical bounds on the error of Bayesian posterior approximations: A nonasymptotic approach. *arXiv:1809.09505 [stat.TH].*

- **J. H. Huggins**, T. C. Campbell, M. Kasprzak & T. Broderick. Scalable Gaussian process inference with finite-data mean and variance guarantees. *arXiv:1806.10234 [stat.ML].*

- R. Agrawal, T. C. Campbell, **J. H. Huggins** & T. Broderick. Data-dependent compression of random features for large-scale kernel approximation. *arXiv:18010.04249 [stat.ML].*

Publications

14. **J. H. Huggins**⋆ & L. Mackey⋆ (2018). Random feature Stein discrepancies. In *Proc. of the 32nd Annual Conference on Neural Information Processing Systems.*

13. T. C. Campbell⋆, **J. H. Huggins**⋆, J. P. How & T. Broderick (To appear). Truncated Random Measures. *Bernoulli.*

12. **J. H. Huggins**⋆ & D. M. Roy⋆ (To appear). Sequential Monte Carlo as approximate sampling: bounds, adaptive resampling via ∞-ESS, and an application to particle Gibbs. *Bernoulli.*

11. **J. H. Huggins**, 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.*
▷ Selected for spotlight presentation (top 22% of accepted papers)

10. **J. H. Huggins**⋆ & J. Zou⋆ (2017). Quantifying the Accuracy of Approximate Diffusions and Markov Chains. In *Proc. of the 19th International Conference on Artificial Intelligence and Statistics.*

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

8. **J. H. Huggins** & J. B. Tenenbaum (2015). Risk and Regret of Hierarchical Bayesian Learners. In *Proc. of the 32nd International Conference on Machine Learning.*

7. **J. H. Huggins**⋆, 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.*

6. **J. H. Huggins** & C. Rudin (2014). A statistical learning theory framework for supervised pattern discovery. In *Proc. of SIAM International Conference on Data Mining.*

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

4. E. Pnevmatikakis, K. Rahnama Rad, **J. H. Huggins** & 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.

3. **J. H. Huggins** & 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.

2. M. Vilain, **J. H. Huggins** & 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 2009.*

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

⋆ = contributed equally

Workshop Papers

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

2. **J. H. Huggins**, 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, **J. H. Huggins**, 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

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

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

Invited Talks

Bristol University, Bristol, UK — Spring 2019

SPA 2018, Gothenburg, Sweden — June 2018
Finite-dimensional Approximations of Completely Random Measures

Boston Bayesian Meetup, Boston, MA — April 2018
Scaling Bayesian Inference by Constructing Approximating Exponential Families

Schlumberger Doll Research, Cambridge, MA — April 2018
Scaling Bayesian Inference by Constructing Approximating Exponential Families

Raytheon BBN Technologies, Cambridge, MA — February 2018
Scaling Bayesian Inference: Theoretical Foundations and Practical Methods

Contributed Talks

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

BNP 2017, Paris, France — June 2017
Truncated Random Measures

Professional Service

Journal Reviewer: PLoS One, Journal of Machine Learning Research
Conference Reviewer: Advances in Neural Information Processing Systems, International Conference on Machine Learning, Artificial Intelligence and Statistics

Teaching

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

Professional Experience

Google Inc., New York, NY USA
Summer Engineering Intern — 2012

MITRE Corp., Bedford, MA USA
Technical Co-op — 2007 - 2009