

# Brian L. Trippe

182 Elm St, Cambridge, MA – 02139 – USA

📞 +1 781 424 0865 • ✉ btrippe@mit.edu • 🌐 www.briantrippe.com

## Education

---

- **Massachusetts Institute of Technology** **Cambridge, MA - USA**  
*Ph.D., Computational and Systems Biology*  
National Science Foundation - GRFP Fellow  
Advisor: Tamara Broderick  
2017–2022 (expected)
- **University of Cambridge** **Cambridge - UK**  
*M.Phil., Engineering*  
Euretta J. Kellett Fellow  
Supervisors: Richard Turner and Máté Lengyel  
2016–2017
- **Columbia College** **New York, NY - USA**  
*B.A., Biochemistry and Computer Science, Summa Cum Laude*  
2012–2016

## Experience

---

- **Computer Science and AI Lab (CSAIL)** **Massachusetts Institute of Technology**  
*PhD Candidate* *Spring 2018 – Present*
  - Developing Bayesian methodology for modeling, inference and evaluation in high dimensional linear models, with a focus on applications in genomics
- **Microsoft Research New England** **Microsoft Research**  
*Research Intern. Advisors: Lorin Crawford and Kevin Yang* *Summer 2021*
  - Developed data collection strategies and inference algorithms for multiplexed screens involving fluorescence activated cell sorting (FACS)
- **Computational and Biological Learning Lab (CBL)** **University of Cambridge**  
*Postgraduate Researcher* *September 2016 – August 2017*
  - Documented pathologies in a widely used methodology for quantifying uncertainty in neural networks
  - Developed a Bayesian framework for conditional density estimation for regression problems with complex predictive distributions
- **Google Accelerated Sciences** **Google Research**  
*Undergraduate Intern* *Summer 2014 & Summer 2015*
  - Built deep neural networks to predict binding of DNA aptamers from SELEX-seq experiments
  - Coauthored a patent on using this approach to design improved aptamer sequences
- **Martin Chalfie Lab** **Columbia University**  
*Undergraduate Researcher* *September 2012 – January 2015*

## Leadership and Teaching

---

- **Bayesian Modeling and Inference (6.435)** **MIT - Computer Science**  
*Teaching Assistant* *Spring 2019*
- **High School Studies Program – “Networks Everywhere!”** **MIT - ESP**  
*Volunteer Teacher & Curriculum Developer* *Summer 2018*
- **Introduction to Neuroscience (Part IIA - 3G3)** **University of Cambridge - Engineering**  
*Supervision Leader* *Lent Term 2017*
- **Advanced Programming (COMS W3157)** **Columbia - Computer Science**  
*Teaching Assistant* *Fall 2014 & Spring 2015*

○ **Discrete Mathematics (COMS W3203)**

○ *Teaching Assistant*

**Columbia - Computer Science**

*Fall 2013 & Spring 2014*

○ **Columbia Club Water Polo**

○ *Captain and Goalie*

**Columbia University**

*2012 -2016*

## Selected Publications

---

- **Trippe, B.L.**; Finucane, H.K; Broderick, T. (2021) "For high-dimensional hierarchical models, consider exchangeability of effects across covariates instead of across datasets". Under review. arXiv:2107.06428 [stat.ME]
- **Trippe, B.L.**; Deshpande, S.K; Broderick, T. (2021) "Confidently Comparing Estimators with the c-value". In revision. arXiv:2102.09705 [stat.ME]
- **Trippe, B.L.\***; Nguyen, T.D.\*; Broderick, T. (2021) "Optimal Transport Couplings of Gibbs Samplers on Partitions for Unbiased Estimation" In *3rd Symposium on Advances in Approximate Bayesian Inference*. \*equal contribution. arXiv:2014.04514[stat.ME]
- Weeks, E.M.; Ulirsh J.C.; Cheng, N.Y.; **Trippe, B.L.**; ...; Lander, E.S.; Engreitz J.M.; Finucane H.K. (2020) "Leveraging polygenic enrichments of gene features to predict genes underlying complex traits and diseases". Under review. doi.org/10.1101/2020.09.08.20190561
- **Trippe, B.L.**; Huggins, J. H.; Agrawal, R.; Broderick, T. (2019) "LR-GLM: High-Dimensional Bayesian Inference Using Low-Rank Data Approximations" In *Proc. of the 36th International Conference on Machine Learning*.
- Agrawal, R.; **Trippe, B.L.**; Huggins, J. H.; Broderick, T. (2019) "The Kernel Interaction Trick: Fast Bayesian Discovery of Pairwise Interactions in High Dimensions" In *Proc. of the 36th International Conference on Machine Learning*.
- **Trippe, B.L.**; Turner, R.E. (2017) "Overpruning in Variational Bayesian Neural Networks" In *Neural Information Processing Systems 2017 Workshop on Advances in Approximate Bayesian Inference*. arXiv:1801.06230 [stat.ML]
- **Trippe, B.L.**; Turner, R.E. (2017) "Conditional Density Estimation with Bayesian Normalising Flows" In *Neural Information Processing Systems 2017 Workshop on Bayesian Deep Learning*. arXiv:1802.04908 [stat.ML]
- Zheng, C.; Jin, F.Q.; **Trippe, B.L.**; Wu, J.; Chalfie, M. (2018) "Inhibition of Cell Fate Repressors Secures the Differentiation of the Touch Receptor Neurons of Caenorhabditis Elegans" In *Development*.
- Dimon, M.T.H.; Berndl, M.; Coram, M.A.; **Trippe, B.L.**; Riley, P.F.; Nelson, P.C. (2020). "Neural Network for Processing Aptamer Data" U.S. Patent No. 10,546,650. Washington, DC: U.S. Patent and Trademark Office.
- **Trippe, B.L.**; Prabhakaran, S.; Bussemaker, H.J. (2016) "The K-mer Motif Multinomial Mixture Model" Neural Information Processing Systems 2016 Workshop on Computational Biology. www.doi.org/10.1101/096735

## Professional Activities

---

○ **Epakon Capital**

○ *Member of the Board of Advisors*

**Boston, MA - USA**

*June 2021-Present*

○ **Committee on Undergraduate Admissions and Financial Aid**

○ *Graduate Student Council Representative*

**MIT**

*August 2020-May 2022*

○ **Conference Reviewing**

○ *Program Committee Member*

- Neural Information Processing Systems (NeurIPS)

- International Conference on Machine Learning (ICML)
- Artificial Intelligence and Statistics (AISTATS)
- Uncertainty in Artificial Intelligence (UAI)
- Symposium on Advances in Approximate Bayesian Inference (AABI)
- NeurIPS workshop on Bayesian Nonparametrics
- NeurIPS workshop on Bayesian Deep Learning

## Talks

---

- **Bayesian Young Statisticians Meeting (BAYSM)** **September 2021**  
○ *High-dimensional hierarchical modeling via exchangeability of effects across covariates*
- **Joint Statistical Meetings (JSM)** **August 2021**  
○ *Confidently Comparing Estimators with the c-value*
- **Microsoft Research New England – ML Seminar** **March 2021**  
○ *Confidently Comparing Estimators with the c-value*
- **Advances in Approximate Bayesian Inference – [youtu.be/0yFBWkOp4uc](https://youtu.be/0yFBWkOp4uc)** **January 2021**  
○ *Optimal Transport Couplings of Gibbs Samplers on Partitions for Unbiased Estimation*
- **Joint Statistical Meetings (JSM) – [youtu.be/Ng2HN3zLW10](https://youtu.be/Ng2HN3zLW10)** **August 2020**  
○ *Bayes Estimates for Multiple Related Regressions Under Exchangeability Among Covariates*
- **International Conference on Machine Learning, Long Beach, CA** **June 2019**  
○ *LR-GLM: High-Dimensional Bayesian Inference Using Low-Rank Data Approximations*
- **Broad Institute of MIT and Harvard, Cambridge, MA** **October 2018**  
○ *MIA Series Primer: Fast Bayesian Inference with Low-Rank Data Approximations*
- **Prowler.io, Cambridge - UK** **December 2017**  
○ *Conditional Density Estimation with Bayesian Normalizing Flows*

## Fellowships and Awards

---

- NSF Graduate Research Fellowship, 2018
- Eureka J. Kellett Fellowship (support for MPhil at Cambridge UK), Columbia College, 2016
- Barry Goldwater Scholarship, 2015
- Half Blue in Water Polo, University of Cambridge, 2017
- Hertz Foundation Fellowship Finalist, 2018
- Phi Beta Kappa, Columbia College, 2016
- Summa Cum Laude, Columbia College, 2016
- Departmental Honors in Biological Sciences, Columbia University, 2016
- Departmental Honors in Computer Science, Columbia University, 2016
- ICML Travel Award, 2019