Brian L. Trippe

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RESEARCH Positions	Stanford University , Stanford, CA, USA Department of Statistics, Stanford Data Science Assistant Professor		2024–present	
	Columbia University , New York, NY Department of Statistics Postdoctoral Research Fellow. Advisors	, USA : David Blei and Simon Tavaré	2022-2024	
	University of Washington , Seattle, W Institute for Protein Design Visiting Researcher. Advisor: David Ba	VA, USA ker	2021-2024	
Education	Massachusetts Institute of Technol Ph.D., Computational and Systems Bio National Science Foundation - GRFP F	ogy , Cambridge, MA, USA logy. Advisor: Tamara Broderick ellow	2017-2022	
	University of Cambridge , Cambridg MPhil., Engineering. Advisors: Máté Le Euretta J. Kellett Fellow	e, UK engyel and Richard E. Turner	2016-2017	
	Columbia College , New York, NY, U BA., Computer Science and Biochemist Summa Cum Laude	SA ry	2012-2016	
Industry Experience	Microsoft Research New England, Summer Research Intern. Advisors: Lor	Cambridge, MA, USA in Crawford and Kevin Yang	2021	
	Google Research , Mountain View, CA Summer Engineering Intern. Accelerate	A, USA d Sciences Team	2014 & 2015	
PUBLICATIONS	L. Wu [*] , B. L. Trippe[*] , C. A. Naesseth, ically exact conditional sampling in d 2023.	D. M. Blei, and J. P. Cunningham. Practification models. In <i>Neural Information P</i>	. P. Cunningham. Practical and asymptot- n Neural Information Processing Systems,	
	 J. Yim*, B. L. Trippe*, V. De Bortoli*, E. Mathieu*, A. Doucet, R. Barzilay, and T. S. SE(3) diffusion model with application to protein backbone generation. In <i>Internationa ence on Machine Learning</i>, 2023. R. Berlinghieri, B. L. Trippe, D. R. Burt, R. Giordano, K. Srinivasan, T. Özgökmen, J. T. Broderick. Gaussian processes at the Helm(holtz): a more fluid model for ocean cu <i>International Conference on Machine Learning</i>, 2023. 			
	J. L. Watson*, D. Juergens*, N. R. Bennett*, B. L. Trippe* , J. Yim*, H. E. Eisenach*, W. A. J. Borst, R. J. Ragotte, L. F. Milles, B. I. M. Wicky, N. Hanikel, S. J. Pellock, A. Cour Sheffler, J. Wang, P. Venkatesh, I. Sappington, S. V. Torres, A. Lauko, V. De Bortoli, E. N S. Ovchinnikov, R. Barzilay, T. S. Jaakkola, F. DiMaio, M. Baek, and D. Baker. De nov of protein structure and function with RFdiffusion. <i>Nature</i> , 2023.			

B. L. **Trippe**, S. K. Deshpande, and T. Broderick. Confidently comparing estimates with the c-value. *Journal of the American Statistical Association*, 2023.

- E. M. Weeks, J. C. Ulirsch, N. Y. Cheng, B. L. Trippe, R. S. Fine, J. Miao, T. A. Patwardhan, M. Kanai, J. Nasser, C. P. Fulco, K. C. Tashman, F. Aguet, T. Li, J. Ordovas-Montanes, C. S. Smillie, A. K. Biton Moshe Shalek, A. N. Ananthakrishnan, R. J. Xavier, A. Regev, R. M. Gupta, K. Lage, K. G. Ardlie, J. N. Hirschhorn, E. S. Lander, J. M. Engreitz, and H. K. Finucane. Leveraging polygenic enrichments of gene features to predict genes underlying complex traits and diseases. *Nature Genetics*, 2023.
- B. L. **Trippe***, J. Yim*, D. Tischer, T. Broderick, D. Baker, R. Barzilay, and T. Jaakkola. Diffusion probabilistic modeling of protein backbones in 3D for the motif-scaffolding problem. In *International Conference on Learning Representations*, 2023.
- B. L. Trippe, B. Huang, E. A. DeBenedictis, B. Coventry, N. Bhattacharya, K. K. Yang, D. Baker, and L. Crawford. Randomized gates allow unbiased estimation in sort-seq assays. *Protein Science*, 2022.
- T. D. Nguyen, B. L. **Trippe**, and T. Broderick. Many processors, little time: MCMC for partitions via optimal transport couplings. In *International Conference on Artificial Intelligence and Statistics*, 2022.
- B. L. **Trippe**, H. K. Finucane, and T. Broderick. For high-dimensional hierarchical models, consider exchangeability of effects across covariates instead of across datasets. In *Advances in Neural Information Processing Systems*, 2021.
- B. L. **Trippe**, T. D. Nguyen, and T. Broderick. Optimal transport couplings of Gibbs samplers on partitions for unbiased estimation. In *Advances in Approximate Bayesian Inference*, 2021.
- B. L. Trippe, J. H. Huggins, R. Agrawal, and T. Broderick. LR-GLM: High-dimensional Bayesian inference using low-rank data approximations. In *International Conference on Machine Learning*, 2019.
- R. Agrawal, B. L. Trippe, J. H. Huggins, and T. Broderick. The kernel interaction trick: Fast Bayesian discovery of pairwise interactions in high dimensions. In *International Conference on Machine Learning*, 2019.
- C. Zheng, F. Q. Jin, B. L. **Trippe**, J. Wu, and M. Chalfie. Inhibition of cell fate repressors secures the differentiation of the touch receptor neurons of Caenorhabditis elegans. *Development*, 145(22), 2018.
- B. L. **Trippe** and R. Turner. Overpruning in variational Bayesian neural networks. In *NeurIPS* Workshop on Advances in Approximate Bayesian Inference, 2017.
- B. L. **Trippe** and R. E. Turner. Conditional density estimation with Bayesian normalising flows. In *NeurIPS Workshop on Bayesian Deep Learning*, 2017.
- B. L. **Trippe**, S. Prabhakaran, and H. J. Bussemaker. K-mer motif multinomial mixtures, a scalable framework for multiple motif discovery. *bioRxiv*:096735, 2016.
- * = equal contribution
- PATENTS J. L. Watson, D. C. Juergens, N. Bennett, B. L. **Trippe**, J. Yim, and D. Baker. Universal generative protein design with RoseTTAFold Diffusion, filed 2023.
 - B. L. **Trippe**, L. A. Crawford, K. K. Yang, and N. Bhattacharya. Unbiased sorting and sequencing of objects via randomized gating schemes, pending 2023.
 - M. T. H. Dimon, M. Berndl, M. A. Coram, B. L. **Trippe**, P. F. Riley, and P. C. Nelson. Neural network for processing aptamer data, granted 2020.

INVITED TALKS

Contributed

TALKS

Probabilistic methods for designing functional protein structures

University of Florida - Comp. Methods in Bayesian Statistics, Gainesville, FL, US	A January 2025
NVIDIA – Fundamental Generative AI Research Group, Santa Clara, CA, USA	December 2024
Copenhagen University – Generative AI in Life Science, Copenhagen, DK	April 2024
New York University – Center for Data Science Seminar, New York, NY, USA	March 2024
Columbia University – Biomedical Engineering Seminar, New York, NY, USA	February 2024
Stanford University – Biomedical Data Science Seminar, Stanford, CA, USA	February 2024
University of Pennsylvania Wharton – Statistics Seminar, Philadelphia, PA, USA	February 2024
Columbia University – Mathematical Genomics Seminar, New York, NY, USA	February 2024
University of Michigan – Statistics Seminar, Ann Arbor, MI, USA	February 2024
University of Chicago – Statistics Seminar, Chicago, IL, USA	February 2024
Carnegie Mellon – Statistics Seminar, Pittsburgh, PA, USA	February 2024
Stanford University – Statistics Seminar, Stanford, CA, USA	February 2024
University of British Columbia – Statistics Seminar, Vancouver, BC, CA	January 2024
Harvard University – Statistics Seminar, Cambridge, MA, USA	January 2024
Johns Hopkins – Computer Science Seminar, Baltimore, MD, USA	January 2024
Duke University – Statistics Seminar, Durham, NC, USA	January 2024
Duke University – Cell Biology Seminar, Durham, NC, USA	January 2024
De novo design of protein structure and function with RF diffusion	
Harvard Medical School – SBGrid Consortium, Boston, MA, USA / Virtual	April 2024
NeurIPS – Machine Learning in Structural Biology, New Orleans, LA, USA	December 2023
NeurIPS – Workshop on Diffusion Models, New Orleans, LA, USA	December 2023
Universidad Nacional de Colombia, Bogota, Colombia / Virtual	January 2023
Twisted diffusion sampling for accurate conditional generation with application to	protein design
Oxford University – CS-ML Seminar, Oxford, UK	June 2023
Diffusion probabilistic modeling of protein backbones in 3D for the motif-scaffoldin	a problem

Diffusion probabilistic modeling of protein backbones in 3D for the motif-scaffolding	g problem	
SIAM Conference on Uncertainty Quantification, Trieste, Italy	March 202	24
Microsoft Research AI for Science, Cambridge, UK / Virtual	April 202	23
Valence Discovery – Molecular Modeling and Drug Discovery Series, Virtual	October 202	22
Machine Learning for Protein Engineering Seminar Series, Virtual	September 202	22
Confidently comparing estimators with the c-value		
Columbia University – Statistics GR8201 Guest Lecture	February 202	23
Microsoft Research New England	March 202	21
Probabilistic protein design with diffusion generative models		
Columbia University – Statistics Student Seminar New York NY USA	February 202	23
Dartmouth College – ENGS 58 Guest Lecture Hanover NH USA / Virtual	February 202	23
Harvard University – CS 282r Guest Lecture, Cambridge, MA, USA	September 202	22
For high-dimensional hierarchical models, consider exchangeability of effects across c of across datasets	ovariates instea	ıd
Flatiron Institute – Center for Computational Mathematics, New York, NY	October 202	22
Microsoft Research New England, Cambridge MA, USA	February 202	22
NeurIPS – Learning Meaningful Representations of Life Workshop, Virtual	December 202	21
Broad Institute – Models Inference and Algorithms Seminar, Cambridge, MA, USA	December 202	21
LR-GLM: high-dimensional Bayesian inference using low-rank data approximation.	8	
Broad Institute – Models Inference and Algorithms Primer, Cambridge, MA, USA	October 201	18
Conditional density estimation with Bayesian normalizing flows		
Prowler.io, Cambridge, UK	December 201	17
New Monte Carlo methods for backbone generation with diffusion generative model	\$	
RosettaCon, Seattle, WA	August 202	23

 $Confidently\ comparing\ estimators\ with\ the\ c-value$

	Approximation Methods in Bayesian Analysis, CIRM Marseille, France Joint Statistical Meetings, Virtual	June 2023 August 2021
	Many processors, little time: MCMC for partitions via optimal transport couplings International Conference on Bayesian Nonparametrics, Puerto Varas, Chile International Society for Bayesian Analysis, Montreal, QC, Canada	October 2022 July 2022
	High-dimensional hierarchical modeling via exchangeability of effects across covaria Joint Statistical Meetings, Washington, DC, USA Bayesian Young Statisticians Meeting, Virtual	tes August 2022 September 2021
	Optimal transport couplings of Gibbs samplers on partitions for unbiased estimation Advances in Approximate Bayesian Inference Symposium, Virtual	n January 2021
	Bayes estimates for multiple related regressions under exchangeability among covar Joint Statistical Meetings, Washington, DC, USA / Virtual	iates August 2020
	LR-GLM: high-dimensional Bayesian inference using low-rank data approximations International Conference on Machine Learning, Long Beach, CA, USA	3 June 2019
Honors and Awards	Travel Award, International Society for Bayesian Analysis (ISBA) (2022) Schmidt Science Fellowship Finalist (2022) NSF Graduate Research Fellowship (2018-2022) Travel Award, International Conference on Machine Learning (2019) Hertz Foundation Fellowship Finalist (2018) Euretta J. Kellett Fellowship (support for study at Cambridge UK) (2016-2017) Half Blue in Water Polo, University of Cambridge (2017) 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) Barry Goldwater Scholarship (2015)	
Teaching and Professional Service	 Conference Reviewing International Conference on Artificial Intelligence and Statics (AISTATS) International Conference on Learning Representations (ICLR) International Conference on Machine Learning (ICML) Neural Information Processing Systems (NeurIPS) Symposium on Advances in Approximate Bayesian Inference (AABI) Uncertainty in Artificial Intelligence (UAI) 	
	 Journal Reviewing Annals of Applied Statistics (AOAS) Proceedings of the National Academy of Sciences (PNAS) Statistical Science Transactions in Machine Learning Research (TMLR) 	
	 Other Service Founding Co-organizer, Machine Learning for Protein Engineering Seminar Seri Graduate Student Council Member, MIT Committee on Undergraduate Admiss cial Aid 	es 2022 sions and Finan- 2020-2022
	 Teaching Massachusetts Institute of Technology, Cambridge, MA, USA Teaching Assistant, 6.435 Bayesian Modeling and Inference (Graduate-level) Volunteer Teacher for High School Studies Program, Networks Everywhere 	Spring 2019 Summer 2018

University of Cambridge, Cambridge, UK

• Supervision Leader, Part IIA 3G3 Introduction to Neuroscience

Columbia University

- Teaching Assistant, COMS W3157 Advanced Programming
- Teaching Assistant, COMS W3203 Discrete Mathematics

Fall 2014 and Spring 2015 Fall 2013 and Spring 2014