

Patrick Stinson, PhD

New York, NY

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SKILLS AND EXPERIENCE

Machine Learning MCMC, Bayesian nonparametrics, variational inference, Bayesian experimental design;
Deep learning: feedforward/recurrent architectures, transformers, encoder/decoder LLMs

Programming Python, NumPy, PyTorch

EDUCATION

Ph.D. Computational Neuroscience, Columbia University Sep. 2013 - Dec. 2019
[Center for Theoretical Neuroscience](#)
[Thesis: Generative Modeling and Inference in Directed and Undirected Neural Networks](#)
Advisor: [Liam Paninski](#) (Dual appointments in Statistics and Neuroscience)

B.A. Biological Sciences (Honors), University of Chicago Aug. 2007 - June 2011
Minor in Computational Neuroscience

WORK EXPERIENCE

Postdoctoral Researcher Jan. 2020 - Present
[Kriegeskorte Lab](#), [Zuckerman Institute](#), Columbia University *New York, NY*

- Nonmyopic variational Bayesian experimental design for efficient LLM inference-time scaling. (In progress) [Independently conceived, developing and implementing]
- Modeling generic item features in crowdsourcing/classifier combination problems using Bayesian nonparametrics. SOTA performance on standard crowdsourcing benchmarks. [Independently conceived, developed, implemented, wrote]
- Bayesian nonparametric modeling of generic dependency structures among classifiers that arise in classifier combination problems. SOTA performance on standard crowdsourcing benchmarks. [Independently conceived, developed, implemented, wrote]
- Crowdsourcing of probability judgments with very large and sparse data. [co-developed, implemented]

PhD Student Sep. 2013 - Dec. 2019
[Paninski Group](#), [Center for Theoretical Neuroscience](#), Columbia University *New York, NY*

- SOTA estimation of normalizing constants in Restricted Boltzmann Machines (RBM) with a novel method called Rao-Blackwellized Tempered Sampling (RTS). [co-developed, co-implemented, co-wrote]
- SOTA test log-likelihoods for VAEs of various architectures using a novel strategy called the decoupled aggregate prior estimation network. [Independently conceived, developed, implemented, wrote]
- Superior training convergence time for VAEs over β -annealing using a novel weight initialization scheme based on properties of the ELBO. [Independently conceived, developed, implemented, wrote]

Research Assistant June 2011 - March 2013
Osborne Lab, University of Chicago *Chicago, IL*

- Demonstrating efficient coding of stochastic visual motion stimuli in the smooth pursuit eye movement system. [Implemented]

PUBLICATIONS

- P. Stinson, N. Kriegeskorte, Inferring dependency structures for Bayesian classifier combination. (submitted)
- P. Stinson, N. Kriegeskorte, Nonparametric Bayesian inference of item-level features in classifier combination. (UAI 2025)
- P. Stinson, J. van den Bosch, T. Jerde, N. Kriegeskorte, Collective inference of human probability judgments (submitted)
- P. Stinson, Decoupling aggregate priors in variational autoencoders. (In PhD Thesis 2020)
- P. Stinson, ELBO amputation: an initialization scheme for variational autoencoders. (In PhD Thesis 2020)
- E. Buchanan*, J. Friedrich*, I. Kinsella*, P. Stinson*, P. Zhou*, F. Gerhard, J. Ferrante, G. Dempsey, L. Paninski, Constrained matrix factorization methods for denoising and demixing voltage imaging data. (COSYNE 2018)
- D. Carlson*, P. Stinson*, A. Pakman*, L. Paninski, Partition functions from Rao-Blackwellized tempered sampling. (ICML 2016)
- D. Soudry, S. Keshri, P. Stinson, M. Oh, G. Iyengar, L. Paninski, Efficient “shotgun” inference of neural connectivity from highly sub-sampled activity data (PLoS Comp Bio 2015)
- P. Stinson and K. Bush, Exogenous control and dynamical reduction of echo state networks. (IJCNN 2013)
- P. Stinson and L. Osborne, Efficient coding of visual motion signals in the smooth pursuit system (COSYNE 2012)