

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

- Variational Bayesian optimal experimental design for efficient LLM inference-time scaling. (In progress)
- Bayesian nonparametric inference of conditional dependencies among classifiers in classifier combination problems to provide more calibrated predictions. SOTA performance on standard crowdsourcing benchmarks.
- Modeling generic item features in crowdsourcing/classifier combination problems using Bayesian nonparametrics. SOTA performance on standard crowdsourcing benchmarks.
- Crowdsourcing of probability judgments with very large and sparse data.

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).
- SOTA test log-likelihoods for VAEs of various architectures using a novel strategy called the decoupled aggregate prior estimation network.
- Superior training convergence time for VAEs over β -annealing using a novel weight initialization scheme based on properties of the ELBO.

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.

PUBLICATIONS

P. Stinson, N. Kriegeskorte, Mitigating overconfidence in 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)

* denotes equal contribution