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, SQL

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)

* denotes equal contribution