

# Patrick Stinson, PhD

New York, NY

[patrickstinson@gmail.com](mailto:patrickstinson@gmail.com) ◊ [LinkedIn](#)

## SKILLS AND EXPERIENCE

---

<b>Machine Learning</b>	MCMC, Bayesian nonparametrics, variational inference, Bayesian experimental design; Deep learning: feedforward/recurrent architectures, transformers, encoder/decoder LLMs
<b>Programming</b>	Python, NumPy, PyTorch

## EDUCATION

---

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

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

## WORK EXPERIENCE

---

<b>Postdoctoral Researcher</b> <a href="#">Kriegeskorte Lab, Zuckerman Institute</a> , Columbia University	Jan. 2020 - Present <i>New York, NY</i>
---	--

- 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.

<b>PhD Student</b> <a href="#">Paninski Group, Center for Theoretical Neuroscience</a> , Columbia University	Sep. 2013 - Dec. 2019 <i>New York, NY</i>
---	--

- 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  $\beta$ -annealing using a novel weight initialization scheme based on properties of the ELBO.

<b>Research Assistant</b> Osborne Lab, University of Chicago	June 2011 - March 2013 <i>Chicago, IL</i>
---	--

- 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