

Scott W. Linderman

CONTACT INFORMATION	Department of Statistics Sequoia Hall, Room 228 390 Jane Stanford Way Stanford University Stanford, CA 94305-4020	
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PROFESSIONAL EXPERIENCE	Stanford University Assistant Professor, Department of Statistics Institute Scholar, Wu Tsai Neurosciences Institute	2019-present
	Columbia University Postdoctoral Fellow, Department of Statistics Advisors: Liam Paninski and David Blei	2016-2019
	Microsoft Corporation Software Development Engineer in Test	2008-2011
EDUCATION	Harvard University Ph.D., Computer Science Advisors: Ryan Adams and Leslie Valiant	2013-2016
	Harvard University S.M., Computer Science Advisor: Leslie Valiant	2011-2013
	Cornell University B.S., Electrical and Computer Engineering <i>Magna cum Laude</i> with Honors in Engineering	2004-2008
HONORS AND AWARDS	Allen Institute Next Generation Leaders Council	2019
	Best Paper, 20th International Conference on Artificial Intelligence and Statistics (AISTATS) <i>With Christian Naesseth, Francisco Ruiz, and David Blei</i>	2017
	Simons Collaboration on the Global Brain Postdoctoral Fellowship	2016
	Leonard J. Savage Award, International Society for Bayesian Analysis <i>Outstanding Dissertation in Applied Methodology</i>	2017
	Siebel Scholarship	2015
	National Defense Science and Engineering Graduate Fellowship	2011
	Cornell University John McMullen Dean's Merit Scholarship	2004
	CollegeBoard AP Scholar with Distinction	2004
	Rensselaer Medal	2003
PUBLICATIONS	Note: all publications have authors listed in the order as published. Authorship convention in the field: lead senior author is listed last; lead junior author is listed first (and second, when asterisks denote joint lead authorship).	

- Ruoxi Sun*, **Scott W. Linderman***, Ian Kinsella, and Liam Paninski. Scalable Bayesian inference of dendritic voltage via spatiotemporal recurrent state space models. *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.
Selected for Oral Presentation (0.5% of all submissions)
- Ifigeneia Apostolopoulou, **Scott W. Linderman**, Kyle Miller, and Artur Dubrawski. Mutually regressive point processes. *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.
- Aaron Schein, **Scott W. Linderman**, Mingyuan Zhou, David Blei, and Hanna Wallach. Poisson-randomized gamma dynamical systems. *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.
- Eleanor Batty*, Matthew Whiteway*, Shreya Saxena, Dan Biderman, Taiga Abe, Simon Musall, Winthrop Gillis, Jeffrey Markowitz, Anne Churchland, John Cunningham, **Scott W. Linderman**[†], and Liam Paninski[†]. Behavenet: nonlinear embedding and Bayesian neural decoding of behavioral videos. *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.
- Robert Evan Johnson*, **Scott W Linderman***, Thomas Panier, Caroline Lei Wee, Erin Song, Kristian Joseph Herrera, Andrew Miller, and Florian Engert. Probabilistic models of larval zebrafish behavior: Structure on many scales. *bioRxiv*, 2019.
- **Scott W. Linderman**, Annika L. A. Nichols, David M. Blei, Manuel Zimmer, and Liam Paninski. Hierarchical recurrent state space models reveal discrete and continuous dynamics of neural activity in *C. elegans*. *bioRxiv*, 2019.
- Josue Nassar, **Scott W. Linderman**, Monica Bugallo, and Il Memming Park. Tree-structured recurrent switching linear dynamical systems for multi-scale modeling. In *International Conference on Learning Representations (ICLR)*, 2019.
- Wesley Tansey, Kathy Li, Haoran Zhang, **Scott W Linderman**, Raul Rabadan, David M Blei, and Chris H Wiggins. Dose-response modeling in high-throughput cancer drug screenings: A case study with recommendations for practitioners. *arXiv preprint arXiv:1812.05691*, 2018.
- Jeffrey E. Markowitz, Winthrop F. Gillis, Celia C. Beron, Shay Q. Neufeld, Keiramarie Robertson, Neha D. Bhagat, Ralph E. Peterson, Emalee Peterson, Minsuk Hyun, **Scott W. Linderman**, Bernardo L. Sabatini, and Sandeep Robert Datta. The striatum organizes 3D behavior via moment-to-moment action selection. *Cell*, May 2018.
- Anuj Sharma, Robert E. Johnson, Florian Engert, and **Scott W. Linderman**. Point process latent variable models of freely swimming larval zebrafish. *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.
- Gonzalo E. Mena, David Belanger, **Scott W. Linderman**, and Jasper Snoek. Learning latent permutations with Gumbel-Sinkhorn networks. *International Conference on Learning Representations (ICLR)*, 2018.
- **Scott W. Linderman**, Gonzalo E. Mena, Hal Cooper, Liam Paninski, and John P. Cunningham. Reparameterizing the Birkhoff polytope for variational permutation inference. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.
- Christian A. Naesseth, **Scott W. Linderman**, Rajesh Ranganath, and David M. Blei. Variational Sequential Monte Carlo. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.

- **Scott W. Linderman***, Matthew J. Johnson*, Andrew C. Miller, Ryan P. Adams, David M. Blei, and Liam Paninski. Bayesian learning and inference in recurrent switching linear dynamical systems. In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2017.
- Christian A. Naesseth, Francisco J. R. Ruiz, **Scott W. Linderman**, and David M. Blei. Reparameterization gradients through acceptance-rejection sampling algorithms. In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2017. **Received Best Paper Award.**
- **Scott W. Linderman** and David M. Blei. Comment: A discussion of “Nonparametric Bayes modeling of populations of networks”. *Journal of the American Statistical Association*, 112(520):1543–1547, 2017.
- **Scott W. Linderman** and Samuel J. Gershman. Using computational theory to constrain statistical models of neural data. *Current Opinion in Neurobiology*, 46:14–24, 2017.
- **Scott W. Linderman**. *Bayesian methods for discovering structure in neural spike trains*. PhD thesis, Harvard University, 2016. **Received the Savage Award from the International Society for Bayesian Analysis.**
- **Scott W. Linderman**, Ryan P. Adams, and Jonathan W. Pillow. Bayesian latent structure discovery from multi-neuron recordings. In *Advances in Neural Information Processing Systems (NIPS)*, 2016.
- Huseyin Melih Elibol, Vincent Nguyen, **Scott W. Linderman**, Matthew J. Johnson, Amna Hashmi, and Finale Doshi-Velez. Cross-corpora unsupervised learning of trajectories in autism spectrum disorders. *Journal of Machine Learning Research*, 17(133):1–38, 2016.
- **Scott W. Linderman**, Matthew J. Johnson, Matthew A. Wilson, and Zhe Chen. A Bayesian nonparametric approach to uncovering rat hippocampal population codes during spatial navigation. *Journal of Neuroscience Methods*, 263:36–47, 2016.
- **Scott W. Linderman***, Matthew J. Johnson*, and Ryan P. Adams. Dependent multinomial models made easy: Stick-breaking with the Pólya-gamma augmentation. In *Advances in Neural Information Processing Systems (NIPS)*, pages 3438–3446, 2015.
- **Scott W. Linderman** and Ryan P. Adams. Scalable Bayesian inference for excitatory point process networks. *arXiv preprint arXiv:1507.03228*, 2015.
- **Scott W. Linderman**, Christopher H. Stock, and Ryan P. Adams. A framework for studying synaptic plasticity with neural spike train data. In *Advances in Neural Information Processing Systems (NIPS)*, pages 2330–2338, 2014.
- **Scott W. Linderman** and Ryan P. Adams. Discovering latent network structure in point process data. In *Proceedings of the International Conference on Machine Learning (ICML)*, pages 1413–1421, 2014.

RESEARCH
SUPPORT

- **Toward a unified framework for dopamine signaling in the striatum**
Total award: \$18,505,241
Funding agency: NIH NINDS (Natl. Inst. of Neurological Disorders and Stroke)
Award number: 1U19NS113201
Award period: 8/15/2019 – 7/31/2024
Lead PI: B. Sabatini
Co-PIs: J. Assad, S. Datta, S. Gershman, S. Linderman, N. Uchida, L. Wilbrecht
- **Neural representation of mating partners by male *C. elegans***
Total award: \$3,316,395
Funding agency: NIH NINDS (Natl. Inst. of Neurological Disorders and Stroke)
Award number: 1R01NS113119
Award period: 8/15/2019 – 7/31/2024
Lead PI: P. Sternberg Co-PIs: S. Linderman, A. Samuel
- **Multi-modal Inference in Brains, Minds, and Machines**
Total award: \$75,000
Funding Agency: Stanford Institute for Human-Centered Artificial Intelligence
Award number: N/A
Award period: 3/13/2019 – 3/12/2020
Lead PI: T. Gerstenberg
Co-PIs: J. Gardner, H. Gweon, S. Linderman
- **Scalable probabilistic inference for mechanistic models: Bridging the gap between scientific modelling and machine learning**
Total award: €6,000
Funding agency: Bavaria–California Technology Center (BaCaTeC)
Award number: N/A
Award period: 1/1/2019 – 6/1/2020
Co-PIs: S. Linderman and J. Macke

TEACHING
EXPERIENCE

- **CS229: Biology and Complexity**, Harvard University 2015
Instructor: Leslie Valiant
- **CS228: Computational Learning Theory**, Harvard University 2014
Instructor: Leslie Valiant
- **CS281: Advanced Machine Learning**, Harvard University 2013
Instructor: Ryan Adams
- **Columbia Advanced Machine Learning Seminar** 2016-2017
web: <https://casmls.github.io>

PROFESSIONAL
SERVICE

- Area Chair: Neural Information Processing Systems (NeurIPS 2019)
- Workshop Co-organizer: “Learning Meaningful Representations of Life” (NeurIPS 2019), “Workshop on Automated Neuro-behavioral Analysis” (COSYNE 2017), “Workshop on Discovering Structure in Neural Data” (COSYNE 2014).
- Reviewer: Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), Neural Computation, PLoS Computational Biology, Journal of Computational Neuroscience, Conference on Artificial Intelligence (AAAI), Artificial Intelligence and Statistics (AISTATS), Nature Communications.

STUDENT
ADVISING

- Blue Sheffer, Graduate Student, Computer Science 2019-present
- Jimmy Smith, Graduate Student, ICME 2019-present
- Libby Zhang, Graduate Student, Electrical Engineering 2019-present

POSTDOCTORAL
ADVISING

- Alex Williams, Postdoctoral Researcher, Statistics 2019-present

INVITED TALKS

- *Hierarchical recurrent models of neural activity and natural behavior*
Cosyne Workshop on Social Behavior. Lisbon, Portugal. March 5, 2019.
- *Using computational theory to constrain state space models of neural data*
Cosyne Workshop on Data, dynamics, and computation: Using data driven methods to ground mechanistic theory. Lisbon, Portugal. March 4, 2019.
- *Hierarchical recurrent models of neural activity and natural behavior*
Theoretical and Computational Neuroscience Annual Conference, Gulf Coast Consortium. February 1, 2019.
- *Finding structure in neural populations: from HMMs to Deep State Space Models: Part 1 and 2*
NeuroNex Workshop, Rice and Baylor University. January 31, 2019.
- *Hierarchical recurrent models of neural activity and natural behavior*
Applied Math Seminar, Yale University. January 29, 2019.
- *Point process latent variable models for two problems in neuroscience*
Artificial Intelligence Seminar, Cornell University. September 28, 2018.
- *Deep State Space Models for Modern Neuroscientific Data*
Center for Neuroengineering and Computation Seminar, Columbia University. September 24, 2018.
- *Deep State Space Models for Modern Neuroscientific Data*
Simons Collaboration on the Global Brain, New York Area Postdoc Meeting. September 20, 2018.
- *Deep State Space Models for Modern Neuroscientific Data*
Air Force Research Laboratory, Rome, NY. August 27, 2018.
- *Discovering Structure in Neural and Behavioral Data* IACS Seminar, Stony Brook University. July 13, 2018.
- *Characterizing Neural Dynamics with Hierarchical Recurrent Models*
Simons Workshop on Manifold Discovery. April 6, 2018.
- *Bayesian Methods for Discovering Structure in Neural and Behavioral Data*
Statistics Department, Stanford University. April 5, 2018.
- *Discovering Structure in Neural and Behavioral Data*
Allen Institute for Brain Science. March 28, 2018.
- *Machine Learning Models and Algorithms for Neuroscience*
Paul Allen School of Computer Science and Engineering, University of Washington. March 26, 2018.

- *Discovering Structure in Neural and Behavioral Data*
Janelia Farm Research Campus. February 28, 2018.
- *Discovering Structure in Neural and Behavioral Data*
Stanford Neurosciences Institute, Stanford University. February 20, 2018.
- *Discovering Structure in Neural and Behavioral Data*
Zuckerman Institute, Columbia University. February 13, 2018.
- *Bayesian Methods for Discovering Structure in Neural and Behavioral Data*
Statistics Department, Columbia University. February 12, 2018.
- *Discovering Structure in Neural and Behavioral Data*
Biophysics Department, University of Washington. February 5, 2018.
- *Discovering Structure in Neural and Behavioral Data*
Center for Brain Science, Harvard University. January 30, 2018.
- *A Tutorial on Recurrent State Space Models*
Project SEM Multidisciplinary University Research Initiative (MURI), Princeton University. September 17, 2017.
- *Recurrent State Space Models*
Air Force Research Laboratory, Rome, NY. August 7, 2017.
- *Using computational theory to constrain statistical models of neural data*
Princeton Neurosciences Institute, Princeton University. June 22, 2017.
- *Bayesian Learning and Inference with Recurrent Switching Linear Dynamical Systems*
Machine Learning and Friends Seminar, UMass Amherst. May 4, 2017.
- *Bayesian Learning and Inference with Recurrent Switching Linear Dynamical Systems*
Models, Inference, and Algorithms (MIA) Seminar, The Broad Institute. April 12, 2017.
- *Neuro-Behavioral Analysis with Recurrent Switching Linear Dynamical Systems*
Workshop on High-Dimensional Neuro-Behavioral Analysis, Cosyne. February 28, 2017.
- *Neuro-Behavioral Analysis with Recurrent Switching Linear Dynamical Systems*
Statistical Analysis of Neural Data Seminar, Stanford University. February 22, 2017.
- *Bayesian Methods for Discovering Network Structure in Neural Spike Trains.*
Connectomics II Workshop, Neural Information Processing Systems (NIPS). December 10, 2016.
- *Discrete Models with Continuous Latent Structure.*
Statistics and Math Reading Club, The Broad Institute. October 19, 2015.
- *Discovering Latent Structure in Neural Spike Trains with Negative Binomial Generalized Linear Models*
Computational Statistics and Neuroscience Seminar, Columbia University. March 18, 2015.
- *Discovering Latent Network Structure in Neural Spike Trains.*
Machine Learning and Friends, University of Massachusetts at Amherst. February 12, 2015.
- *Discovering Interpretable Structure in Neural Spike Trains with Negative Binomial GLMs.*
Applied Statistics Seminar, University of Washington. January 8th, 2015.

- *Discovering Interpretable Structure in Neural Spike Trains with Negative Binomial GLMs.*
Harvard Center for Brain Science (CBS) Neurolunch, December 3rd, 2014.
- *Discovering Latent Network Structure in Point Process Data.*
Lazer Lab Meeting, Northeastern University. September 4th, 2014.
- *Discovering Latent Network Structure in Point Process Data.*
Harvard Computer Science Colloquium. July 24th, 2014.
- *Discovering Latent Networks in Neural Spike Train Recordings.*
David Cox Lab Meeting, Harvard University. July 10th, 2014.
- *Fitting Biophysical Models to Optical Fluorescence Traces.*
Adam Cohen Lab Meeting, Harvard University. May 5th, 2014.
- *Discovering Latent Network Structure in Spiking Data.*
Boston Data Mining Meetup. May 1st, 2014.
- *Discovering Latent Network Structure in Spiking Data.*
Applied Statistics Workshop, Harvard University. September 4th, 2013.