

Dave Moore

+1 (510) 730 2718
✉ dmoore@cs.berkeley.edu
📁 cs.berkeley.edu/~dmoore
🌐 github.com/davmre

Education

- 2010–2016 **PhD in Computer Science**, *University of California, Berkeley, CA*.
Thesis: Signal-based Bayesian Seismic Monitoring
Advisor: Stuart Russell
Developed a system for detecting nuclear tests and seismic events using Bayesian inference in a fully generative model of seismic waveforms, unifying several aspects of seismic physics in a single model with state-of-the-art results.
- Coursework in statistical learning theory, theoretical statistics, graduate algorithms, probability theory, randomness and computation, computer vision, natural language processing, advanced robotics, reinforcement learning, probabilistic models of cognition, etc.
- 2006–2010 **Bachelor of Arts in Computer Science and Mathematics**, *Williams College, Williamstown, MA*, Magna cum laude with Honors in Computer Science.
Thesis: Transfer and Structure Learning in Markov Logic Networks (w/ Andrea Danyluk)

Employment

- 2017– **Postdoctoral Researcher**, *University of California, Berkeley*, with Stuart Russell.
- Summer 2014 **Research Intern**, *Microsoft Research, Cambridge, UK*.
Explored the impact of parameter symmetries on fitting and tuning hyperparameters of variational Bayesian matrix factorization models, and developed new algorithms to break symmetries during the variational optimization (supervised by Tom Minka).
- Summer 2009 **Research Assistant**, *UMass Computer Vision Laboratory, Amherst, MA*.
Designed, developed, and implemented a system to recognize common household sounds using hidden Markov models, with applications towards monitoring human behavior (supervised by Al Hanson and Adam Williams).
- Summer 2008 **Software Engineering Intern**, *Google, Cambridge, MA*.
Evaluated methods for extracting sentiment from book reviews; also worked to streamline and refactor the metadata pipeline underlying Google Book Search.

Research

Interests: Bayesian modeling and probabilistic programming, efficient probabilistic inference, variational methods, deep generative models, unsupervised learning, Gaussian processes, scientific applications of machine learning, and more.

Selective Conferences

David A. Moore and Stuart J. Russell. Signal-based Bayesian Seismic Monitoring. In *Artificial Intelligence and Statistics (AISTATS)*, Fort Lauderdale, FL, April 2017.
Oral Presentation (28/168 accepted papers).

David A. Moore and Stuart J. Russell. Gaussian Process Random Fields. In *Advances in Neural Information Processing Systems (NIPS)*, Montreal, December 2015.

David A. Moore and Stuart J. Russell. Fast Gaussian Process Posteriors with Product Trees. In *Proceedings of Uncertainty in Artificial Intelligence (UAI)*, Quebec City, July 2014.

Peer-Reviewed Workshops

Jun Song and David A. Moore. Parallel Chromatic MCMC with Spatial Partitioning. *AAAI Workshop on Distributed Machine Learning*, February 2017.

David A. Moore. Symmetrized Variational Inference. *NIPS Workshop on Advances in Approximate Bayesian Inference*, December 2016. **Spotlight presentation.**

David A. Moore and Stuart J. Russell. Product Trees for Gaussian Process Covariance in Sublinear Time. In *UAI Workshop on Models of Spatial, Temporal, and Network Data (UAI-MSTND)*, Bellevue, WA, July 2013.

David A. Moore, Kevin Mayeda, Stephen C. Myers, Min Joon Seo, and Stuart J. Russell. Progress in Signal-based Bayesian Monitoring. In *Proceedings of Monitoring Research Review (MRR)*, Albuquerque, NM, September 2012.

Stuart J. Russell, Stephen C. Myers, Nimar S. Arora, David A. Moore, and Erik Sudderth. Bayesian Treaty Monitoring: Preliminary Report. In *Proceedings of Monitoring Research Review (MRR)*, Tucson, AZ, September 2011.

David A. Moore and Andrea Danyluk. Deep Transfer as Structure Learning in Markov Logic Networks. In *Proceedings of the AAAI-2010 Workshop on Statistical Relational AI (StarAI)*, Atlanta, GA, July 2010.

Selected Misc. Presentations

Bayesian Treaty Monitoring. DTRA Basic Research Technical Review (Annual), 2012–2016. Springfield, VA.

Signal-Based Bayesian Seismic Monitoring Monitoring. CTBT Science and Technology Conference, June 2015. Vienna.

Bayesian Treaty Monitoring. Bayesian Young Statisticians Meeting (BAYSM), **Best presentation award**, September 2014. Vienna.

Teaching

Undergraduate Research Mentoring

- Min Joon Seo (Berkeley '12): single-observation location of seismic events using Gaussian process models of waveform features.
- Sharad Vikram (Berkeley '14): approximate inference for Gaussian processes with non-Gaussian observation models.
- Alex Ding (Berkeley '15): modeling of seismic signal correlations at array stations.
- Zhiyuan Lin (Berkeley '16): applying splash belief propagation for GPU parallelization of Kalman filter likelihood calculations.

- Jun Song (Berkeley '16.5): parallelizing probabilistic inference for spatial/temporal models with Chromatic Metropolis-Hastings.
- Tongzhou Wang (Berkeley '17): training neural nets to generate reusable approximate proposals for block Gibbs sampling.

Graduate Student Instructor (Berkeley)

Fall 2012 **CS 188: Introduction to Artificial Intelligence**, *Instructors: Dan Klein and Pieter Abbeel.*

Spring 2012 **CS 70: Discrete Mathematics and Probability Theory**, *Instructor: Alistair Sinclair.*

Led discussion sections, held office hours, responded to online forum questions, wrote and graded exams, developed course materials and infrastructure (including initial edX offering of CS188), and assisted with logistics for large (300+ students each) undergraduate courses.

Teaching Assistant (Williams)

Fall 2009 **CS 361: Theory of Computation.**

Fall 2008 **CS 237: Computer Organization.**

2007 – 2008 **CS 134: Introduction to Computer Science.**

Held review sessions and office hours, assisted with lab sessions, and graded problem sets and programming assignments.

Awards and Honors

- 2014 Best presentation, Bayesian Young Statisticians Meeting (BAYSM)
- 2010 Sam Goldberg prize for best mathematics colloquium given by a graduating senior.
- 2010 Williams Class of 1960 Scholar in Computer Science.
- 2009 Elected to Phi Beta Kappa, served as Williams chapter Vice President.

Service

- 2017 **Neural Information Processing Systems (NIPS)**, *Reviewer.*
- 2017 **International Conference on Machine Learning (ICML)**, *Program Committee.*
- 2016 **Advances in Approximate Bayesian Inference (AABI, NIPS workshop)**, *Program Committee.*
- 2014, 2016 **Berkeley CS PhD Admissions Committee**, *Reader for AI applicants.*
- 2012–2013 **Berkeley Computer Science Graduate Student Association (CSGSA)**, *Vice-President.*

Technical skills

Generally fluent: Python and the numpy/scipy stack, C, Java, Haskell, deep learning frameworks (e.g., Tensorflow). Experience with C++, C#, MATLAB, Javascript, Julia, Scala, Scheme.

Recent side projects include a framework for deep probabilistic programming in Tensorflow (github.com/davmre/elbow), and a Haskell-based optimizing compiler for linear algebraic expressions (matrizer.org).