

EMILY B. FOX

PROFESSOR, DEPARTMENT OF STATISTICS
PROFESSOR, BY COURTESY, DEPARTMENT OF COMPUTER SCIENCE
STANFORD UNIVERSITY

ebfox@stanford.edu

<https://www.emilybfox.com/>

RESEARCH INTERESTS

Modeling of large-scale time series, scalable Bayesian methods, health and computational neuroscience

EDUCATION

- Doctorate of Philosophy**, Massachusetts Institute of Technology September 2009
Electrical Engineering and Computer Science
Thesis: Bayesian Nonparametric Learning of Complex Dynamical Phenomena
Committee: Alan Willsky (advisor), John Fisher (advisor), Munzer Dahleh, David Blei
- Electrical Engineer**, Massachusetts Institute of Technology June 2008
Electrical Engineering and Computer Science
- Master of Engineering**, Massachusetts Institute of Technology June 2005
Electrical Engineering and Computer Science
Thesis: Detection and Localization of Aerosol Releases from Sparse Sensor Measurements
Advisors: Alan Willsky, John Fisher
- Bachelor of Science**, Massachusetts Institute of Technology June 2004
Electrical Science and Engineering
- Cambridge MIT Institute (CMI) Exchange Program**, Cambridge University, Cambridge, UK 2002-2003

FELLOWSHIPS & AWARDS

- CZ Biohub Investigator Award 2022
- Best of Annals of Applied Statistics 2019 recognition 2019
- Amazon AWS Machine Learning Research Award 2018
- Presidential Early Career Award in Science & Engineering (PECASE) 2017
- AWIS Seattle Chapter Award for Scientific Advancement in STEM 2017
- ONR Young Investigator Award 2015
- Sloan Research Fellowship 2015
- NSF CAREER Award 2014
- Amazon Machine Learning Professorship in Statistics 2012
- Leonard J. Savage Award for Best Thesis in Applied Methodology 2009
- MIT EECS Jin-Au Kong Outstanding Doctoral Thesis Prize 2009
- National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship 2009
- National Defense Science and Engineering Graduate (NDSEG) Fellowship 2005
- National Science Foundation Graduate Research Fellowship 2005
- Chorafas Award for excellent academic performance and superior contributions in research 2005
- David Adler Memorial 2nd Place Thesis Prize for Best MIT Master's Thesis in EE 2005

EMILY B. FOX

PROFESSIONAL EXPERIENCE

Professor Department of Statistics and, by courtesy, Computer Science, Stanford University	September 2021—present
Distinguished Engineer, Lead of Health AI Apple	October 2018 – August 2021
Professor School of Computer Science & Engineering and Department of Statistics, University of Washington	September 2020 – Aug 2021
Associate Professor School of Computer Science & Engineering and Department of Statistics, Adjunct in Department of Electrical Engineering, University of Washington	September 2016 – Aug 2020
Assistant Professor Department of Statistics, Adjunct in Departments of Computer Science & Engineering and Electrical Engineering, University of Washington	July 2012 – August 2016
Data Science Fellow eScience Institute, University of Washington	September 2014 – Aug 2021
Assistant Professor Department of Statistics, Wharton, University of Pennsylvania	August 2011 – June 2012
Postdoctoral Scholar Department of Statistical Science, Duke University	August 2009 – July 2011

TEACHING EXPERIENCE

Lecturer –STATS 315 (Modern Applied Statistics: Learning II) Stanford University	Spring 2022
Lecturer –STATS 207/307 (Introduction to Time Series) Stanford University	Fall 2021
Lecturer – CSE/STAT 416 (Introduction to Machine Learning) University of Washington	Spring 2018
Lecturer – CSE 446 (Machine Learning) University of Washington	Winter 2017
Coursera Machine Learning Specialization University of Washington	Summer 2015 – Spring 2016
Lecturer – STAT 548 / CSE 547 (Machine Learning for Big Data) University of Washington	Winter 2013, 2014, Spring 2015
Lecturer – STAT 527 (Nonparametric Regression and Classification) University of Washington	Spring 2013, 2014
Lecturer – Statistics 431 (Statistical Inference) The Wharton School Department of Statistics, University of Pennsylvania	Fall 2011
Teaching Assistant – 6.438 (Algorithms for Estimation and Inference)	Fall 2008
Teaching Assistant – 6.437 (Information and Inference) Massachusetts Institute of Technology	Spring 2008

EMILY B. FOX

ADVISING AND THESIS COMMITTEES

Ph.D. Students

Alex Wang

Postdocs

Ransalu Senanayake

Past Ph.D. Students

Christopher Aicher (UW, Citadel)

Raja Hafiz Affandi (Wharton, Amazon)

Jack Baker (Univ. of Lancaster, AstraZeneca)

Jennifer Gillenwater (UPenn, Google Research)

Yian Ma (UW, Asst. Prof. at UCSD)

Shirley You Ren (UW, Apple)

Alex Tank (UW, Etsy)

Past Postdocs

Nicholas Foti (UW, Apple)

Chris Glynn (UW, Asst. Prof. at UNH)

Tauhid Zaman (Wharton, Assoc. Prof. at Yale)

Past Undergraduate and High School Students

Dillon Laird (UW, Landing.ai)

Rishab Mittal (Briarcliff High School, Credit Suisse)

Thesis Committees

Alex Kulesza, Sivan Aldor-Noiman, Yao Zhang, Drausin

Wulsin, Theresa Smith, Galen Andrew, Michael

Hughes, Ben Lansdell, Sam Wang, Peng Zhang

PREPRINTS AND TECHNICAL REPORTS

Statistical Deconvolution for Inference of Infection Time Series

Andrew C. Miller, Lauren Hannah, Joseph Futoma, Nicholas J. Foti, Emily B. Fox, Alexander D'Amour, Mark Sandler, Rif A. Saurous, Joseph A. Lewnard,

Under review (minor revisions) at *Epidemiology*, medRxiv 2020.10.16.20212753, October 2020.

Mobility Trends Provide a Leading Indicator of Changes in SARS-CoV-2 Transmission

Andrew Miller, Nicholas Foti, Joseph Lewnard, Nicholas Jewell, Carlos Guestrin, and Emily B. Fox, medRxiv 2020.05.07.20094441, May 2020.

Stochastic Gradient MCMC for Nonlinear State Space Models

Christopher Aicher, Srshti Putcha, Christopher Nemeth, Paul Fearnhead, & Emily B. Fox, arXiv 1901.10568, September 2019.

A Unified Framework for Long Range and Cold Start Forecasting of Seasonal Profiles in Time Series

Christopher Xie, Alex Tank, Alec Greaves-Tunnell, & Emily B. Fox, arXiv 1710.08473, October 2017.

Autoregressive Models for Variance Matrices: Stationary Inverse Wishart Processes.

Emily B. Fox and Mike West, arXiv 1107.5239, July 2011.

JOURNAL PUBLICATIONS

Granger Causality: A Review and Recent Advances

Ali Shojaie and Emily B. Fox,

Annual Review of Statistics and its Application, vol. 9, 2022. (arXiv 2105.02675)

It's Complicated: Characterizing the Time-Varying Relationship between Cellphone Mobility and COVID-19 Spread in the US

Joseph Futoma, Sean Jewell, Lauren Hannah, Andy Miller, Nicholas Foti, & Emily B. Fox, *npj Digital Medicine*, vol. 4, no. 152, 2021. (medRxiv 2021.04.24.21255827)

Neural Granger Causality

Alex Tank, Ian Covert, Nicholas Foti, Ali Shojaie, & Emily B. Fox,

IEEE Trans. on Pattern Analysis & Machine Intelligence (early access), 2021. (arXiv 1802.05842)

EMILY B. FOX

Improving Reproducibility in Machine Learning Research (A Report from the NeurIPS 2019 Reproducibility Program)

Joelle Pineau, Philippe Vincent-Lamarre, Koustuv Sinha, Vincent Larivière, Alina Beygelzimer, Florence d'Alché-Buc, Emily Fox, and Hugo Larochelle,
Journal of Machine Learning Research, vol. 22, no. 164, pp. 1-20, 2021. (arXiv 2003.12206)

Breiman's Two Cultures: You Don't Have to Choose Sides

Andrew C. Miller, Nicholas Foti, & Emily B. Fox,
Observational Studies, vol. 7, no. 1, pp. 161-169, 2021. (arXiv 2104.12219)

The Convex Mixture Distribution: Granger Causality Networks for Categorical Time Series

Alex Tank, Emily B. Fox, & Ali Shojaie,
SIAM Journal on Mathematics of Data Science, vol. 3, no. 1, pp. 83-112, 2021. (arXiv 1706.02781)

Statistical Model-Based Approaches for Functional Connectivity Analysis of Neuroimaging Data

Nicholas Foti and Emily B. Fox,
Current Opinion in Neurobiology, vol. 55, pp. 48-53, 2019.

Stochastic Gradient MCMC for State Space Models

Christopher Aicher, Yian Ma, Nicholas Foti, & Emily B. Fox,
SIAM Journal on Mathematics of Data Science, vol. 1, no. 3, pp. 555-587, 2019. (arXiv 1810.09098)

Identifiability and Estimation of Structural Vector Autoregressive Models for Subsampled and Mixed Frequency Time Series.

Alex Tank, Emily B. Fox, & Ali Shojaie,
Biometrika, vol. 106, no. 2, pp. 433-452, 2019. (arXiv 1704.02519)

Control Variates for Stochastic Gradient MCMC

Jack Baker, Paul Fearnhead, Emily B. Fox, & Christopher Nemeth,
Statistics & Computing, vol. 29, no. 3, pp. 599-615, 2019. (arXiv 1706.05439)

Dynamics of Homelessness in America

Chris Glynn and Emily B. Fox,
Annals of Applied Statistics, vol. 13, no. 1, pp. 573-605, 2019. (arXiv 1707.09380)

Irreversible samplers from jump and continuous Markov processes

Yi-An Ma, Emily B. Fox, Tianqi Chen, & Lei Wu,
Statistics & Computing, vol. 29, no. 1, pp. 177-202, 2019. (arXiv 1608.05973)

sgmcmc: An R Package for Stochastic Gradient Markov Chain Monte Carlo

Jack Baker, Paul Fearnhead, Emily B. Fox, & Chris Nemeth,
Journal of Statistical Software, vol. 91, no. 3, October 2019. (arXiv 1710.00578)

Comment: Nonparametric Bayes Modeling of Populations of Networks

Nicholas Foti & Emily B. Fox,
Journal of American Statistical Association, vol. 112, no. 520, pp. 1539-1543, 2018.

Sparse Graphs using Exchangeable Random Measures

Francois Caron and Emily B. Fox,
Journal of the Royal Statistical Society: Series B (read paper), vol. 79, no. 5, pp. 1295-1366, November 2017.

Clustering Correlated, Sparse Data Streams to Estimate a Localized Housing Price Index.

You Ren, Emily B. Fox, & Andrew Bruce,
Annals of Applied Statistics, vol. 11, no. 2, pp. 808-839, 2017.

EMILY B. FOX

- Temporal Behavior of Seizures and Interictal Bursts in Prolonged Intracranial Recordings from Epileptic Canines***
Haomeng Ung, Kathryn Davis, Drausin Wulsin, Joost Wagenaar, Emily B. Fox, J. McDonnell, Edward Patterson, Charles Vite, Gregory Worrell, & Brian Litt,
Epilepsia, vol. 57, no. 12, pp. 1949-1957, 2016.
- A Novel Seizure Detection Algorithm Informed by Hidden Markov Model Event States***
Steven Baldassano, Drausin Wulsin, Haomeng Ung, Tyler Blevins, Mesha-Gay Brown, Emily B. Fox, & Brian Litt
Journal of Neural Engineering, vol. 13, no. 3, April 2016.
- Mining Continuous Intracranial EEG in Focal Canine Epilepsy: Relating Intracranial Bursts to Seizure Onsets***
Kathryn Davis, Drausin Wulsin, Haomeng Ung, Joost Wagenaar, Emily B. Fox, Edward Patterson, Charles Vite, Gregory Worrel, & Brian Litt,
Epilepsia, vol. 57, no. 1, pp. 89-98, January 2016.
- Bayesian Nonparametric Covariance Regression.***
Emily B. Fox and David B. Dunson,
Journal of Machine Learning Research, vol. 16, pp. 2501-2542, December 2015.
- Guest Editors' Introduction to the Special Issue on Bayesian Nonparametrics***
Ryan P. Adams, Emily B. Fox, Erik B. Sudderth, & Yee Whye Teh,
IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 37, no. 2, pp. 209-211, February 2015.
- Modeling the Complex Dynamics and Changing Correlations of Epileptic Events***
Drausin F. Wulsin, Emily B. Fox, & Brian Litt,
Artificial Intelligence, vol. 216, pp. 55-75, November 2014.
- Joint Modeling of Multiple Time Series via the Beta Process with Application to Motion Capture Segmentation.***
Emily B. Fox, Michael C. Hughes, Erik B. Sudderth, & Michael I. Jordan,
Annals of Applied Statistics, vol. 8, no. 3, pp. 1281-1313, September 2014.
- A Bayesian Approach for Predicting the Popularity of Tweets***
Tauhid Zaman, Emily B. Fox, & Eric T. Bradlow,
Annals of Applied Statistics, vol. 8, no. 3, pp. 1583-1611, September 2014.
- A Sticky HDP-HMM with Application to Speaker Diarization.***
Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
Annals of Applied Statistics, vol. 5, no. 2A, pp. 1020-1056, June 2011.
- Bayesian Nonparametric Inference of Switching Dynamic Linear Models.***
Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
IEEE Transactions on Signal Processing, vol. 59, no. 4, pp. 1569-1585, April 2011.
- Bayesian Nonparametric Methods for Learning Markov Switching Processes.***
Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
IEEE Signal Processing Magazine, vol. 27, no. 6, pp. 43-54, November 2010.
- Detection and Localization of Material Releases with Sparse Sensor Configurations.***
Emily B. Fox, John W. Fisher, & Alan S. Willsky,
IEEE Transactions on Signal Processing, vol. 55, no. 5, pp. 1886-1898, May 2007.

PEER REVIEWED CONFERENCE PUBLICATIONS

- Model-based metrics: Sample-efficient estimates of predictive model subpopulation performance***
Andrew Miller, Leon Gatys, Joseph Futoma, and Emily B. Fox,
Proceedings of Machine Learning for Healthcare (MLHC), August 2021.

EMILY B. FOX

Learning Insulin-Glucose Dynamics in the Wild

Andrew Miller, Nicholas Foti, and Emily B. Fox,
Proceedings of Machine Learning for Healthcare (MLHC), August 2020.

Adaptively Truncating Backpropagation Through Time to Control Gradient Bias

Christopher Aicher, Nicholas Foti, & Emily B. Fox,
Conf. on Uncertainty in Artificial Intelligence (UAI), March 2019. (Accept. Rate: 26%)

A Simple Adaptive Tracker with Reminiscences

Christopher Xie, Emily B. Fox, & Zaid Harchaoui,
Proc. IEEE International Conference on Robotics and Automation, May 2019.

Large-Scale Stochastic Sampling from the Probability Simplex

Jack Baker, Paul Fearnhead, Emily B. Fox, & Chris Nemeth,
Neural Information Processing Systems (NeurIPS), 30, MIT Press, 2018. (Accept. Rate: 21%)

oi-VAE: Interpretable VAEs for Nonlinear Factor Analysis

Samuel Ainsworth, Nicholas Foti, Adrian KC Lee, & Emily B. Fox,
International Conf. on Machine Learning (ICML), July 2018. (Accept. Rate: 25%)

Stochastic Gradient MCMC Methods for Hidden Markov Models

Yi-An Ma, Nicholas Foti, & Emily B. Fox,
International Conf. on Machine Learning (ICML), August 2017. (Accept. Rate: 25%)

A Complete Recipe for Stochastic Gradient MCMC

Yi-An Ma, Tianqi Chen, & Emily B. Fox,
Neural Information Processing Systems (NeurIPS), 28, MIT Press, 2016. (Accept. Rate: 22%)

Bayesian Structure Learning for Stationary Time Series

Alex Tank, Nicholas Foti, & Emily B. Fox,
Conf. on Uncertainty in Artificial Intelligence (UAI), July 2015. (Accept. Rate: 34%)

Streaming Variational Inference for Bayesian Nonparametric Mixture Models

Alex Tank, Nicholas Foti, & Emily B. Fox,
Intl. Conf. on Artificial Intelligence and Statistics (AISTATS), May 2015. (Accept. Rate: 27%)

Stochastic Variational Inference for Hidden Markov Models

Nicholas Foti, Jason Xu, Dillon Laird, & Emily B. Fox,
Neural Information Processing Systems (NeurIPS), 27, MIT Press, 2015. (Accept. Rate: 25%)

Expectation-Maximization for Learning Determinantal Point Processes

Jennifer Gillenwater, Alex Kuleza, Emily B. Fox, & Ben Taskar,
Neural Information Processing Systems (NeurIPS), 27, MIT Press, 2015. (Accept. Rate: 25%)

Stochastic Gradient Hamiltonian Monte Carlo

Tianqi Chen, Emily B. Fox, & Carlos E. Guestrin
International Conf. on Machine Learning (ICML), June 2014. (Accept. Rate: 25%)

Learning the Parameters of Determinantal Point Process Kernels

Raja Hafiz Affandi, Emily B. Fox, Ryan P. Adams, & Ben Taskar,
International Conf. on Machine Learning (ICML), June 2014. (Accept. Rate: 25%)

Approximate Inference in Continuous Determinant Point Processes

Raja H. Affandi, Emily B. Fox, & Ben Taskar
Neural Information Processing Systems (NeurIPS), 26, MIT Press, 2014. (Accept. Rate: 5%, Spotlight)

EMILY B. FOX

Representing Documents Through Their Readers

Khalid El-Arini, Min Xu, Emily B. Fox, & Carlos E. Guestrin,
Conf. on Knowledge Discovery and Data Mining (KDD), August 2013. (Acceptance Rate: 17%)

Nystrom Approximation for Large-Scale Determinantal Processes.

Raja H. Affandi, Alex Kulesza, Emily B. Fox, & Ben Taskar
Intl. Conf. on Artificial Intelligence and Statistics (AISTATS), April 2013. (Accept. Rate: 11%, Oral Presentation)

Parsing Epileptic Events Using a Markov Switching Process Model for Correlated Time Series

Drausin Wulsin, Emily B. Fox, & Brian Litt,
International Conf. on Machine Learning (ICML), June 2013. (Accept. Rate: 12%, Oral Presentation)

Multiresolution Gaussian Processes.

Emily B. Fox and David B. Dunson,
Neural Information Processing Systems (NeurIPS), 25, MIT Press, 2013. (Acceptance Rate: 25%)

Effective Split-Merge Monte Carlo Methods for Nonparametric Models of Sequence Data.

Michael C. Hughes, Emily B. Fox, & Erik B. Sudderth
Neural Information Processing Systems (NeurIPS), 25, MIT Press, 2013. (Acceptance Rate: 25%)

Markov Determinantal Point Processes.

Raja H. Affandi, Alex Kulesza, & Emily B. Fox,
Conf. on Uncertainty in Artificial Intelligence (UAI), August 2012. (Acceptance Rate: 31%)

Hierarchical Latent Dictionary Learning for Models of Brain Activation.

Alona M. Fyshe, Emily B. Fox, David B. Dunson, & Tom M. Mitchell,
Intl. Conf. on Artificial Intelligence and Statistics (AISTATS), April 2012. (Acceptance Rate: <6%, Oral Presentation)

Sharing Features among Dynamical Systems with Beta Processes.

Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
Neural Information Processing Systems (NeurIPS), 22, MIT Press, 2010. (Acceptance Rate: 2%, Oral Presentation)

Nonparametric Bayesian Identification of Jump Systems with Sparse Dependencies.

Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
IFAC Symposium on System Identification, July 2009.

Nonparametric Bayesian Learning of Switching Linear Dynamical Systems.

Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
Neural Information Processing Systems (NeurIPS), 21, MIT Press, 2009. (Acceptance Rate: 12%, Spotlight)

An HDP-HMM for Systems with State Persistence.

Emily B. Fox, Erik B. Sudderth, Michael I. Jordan, & Alan S. Willsky,
International Conf. on Machine Learning (ICML), July 2008. (Acceptance Rate: 26%)

Hierarchical Dirichlet Processes for Tracking Maneuvering Targets.

Emily B. Fox, Erik B. Sudderth, & Alan S. Willsky,
International Conf. on Information Fusion (FUSION), July 2007.

Nonparametric Bayesian Methods for Large Scale Multi-Target Tracking.

Emily B. Fox, David S. Choi, & Alan S. Willsky,
Asilomar Conf. On Signals, Systems, and Computers, November 2006.

Detection and Localization of Material Releases with Sparse Sensor Configurations.

Emily B. Fox, Jason L. Williams, John W. Fisher, & Alan S. Willsky,
IEEE International Conf. on Acoustics, Speech, and Signal Processing (ICASSP), May 2006.

EMILY B. FOX

PEER-REVIEWED WORKSHOP PUBLICATIONS

Representing and Denoising Wearable ECG Recordings

Jeffrey Chan, Andy Miller, and Emily B. Fox,
NeurIPS 2020 Mobile Health Workshop, December 2020.

Modeling Patterns of Smartphone Usage and Their Relationship to Cognitive Health

Jonas Rauber, Emily B. Fox, & Leon A. Gatys,
NeurIPS Machine Learning for Health (ML4H) Workshop, December 2019.

An Interpretable and Sparse Neural Network Model for Nonlinear Granger Causality Discovery

Alex Tank, Ian Covert, Nicholas Foti, Ali Shojaie, & Emily B. Fox,
NeurIPS Time Series Workshop, December 2017.

An Efficient ADMM Algorithm for Structural Break Detection in Multivariate Time Series

Alex Tank, Emily B. Fox, & Ali Shojaie,
NeurIPS Time Series Workshop (awarded Best Oral Presentation), December 2017.

A Unified Framework for Missing Data and Cold Start Prediction for Time Series Data

Christopher Xie, Alex Tank, & Emily B. Fox,
NeurIPS Time Series Workshop (awarded Best Oral Presentation), December 2016.

Sparse plus low-rank graphical models of time series for functional connectivity in MEG

Nicholas Foti, Rahul Nadkarni, & Emily B. Fox,
SIGKDD Workshop on Mining and Learning from Time Series, June 2016.

Scalable Clustering of Correlated Time Series using Expectation Propagation

Christopher Aicher and Emily B. Fox,
SIGKDD Workshop on Mining and Learning from Time Series, June 2016.

Granger Causality Networks for Categorical Time Series

Alex Tank, Emily B. Fox, & Ali Shojaie,
SIGKDD Workshop on Mining and Learning from Time Series, June 2016.

Identifiability of Non-Gaussian Structural VAR Models for Subsampled and Mixed Frequency Time Series

Alex Tank, Emily B. Fox, & Ali Shojaie,
SIGKDD Workshop on Causal Discovery, June 2016.

Streaming Variational Inference for Normalized Random Measure Mixture Models

Alex Tank, Nicholas Foti, & Emily B. Fox,
NeurIPS Workshop on Advances in Variational Inference, December 2014.

Detecting and Classifying Anomalous Behavior in Spatiotemporal Network Data

William C. Young, Joshua E. Blumenstock, Emily B. Fox, & Tyler H. McCormick,
KDD Workshop on Learning about Emergencies from Social Information, August 2014.

Nonparametric Learning of Switching Autoregressive Processes

Emily B. Fox, Erik B. Sudderth, Michael I. Jordan & Alan S. Willsky
ICML Workshop on Nonparametric Bayes, July 2008.

BOOK CHAPTERS

Mixed Membership Models for Time Series

Emily B. Fox and Michael I. Jordan,
Handbook of Mixed Membership Models and Their Applications, pp. 417-436, Chapman & Hall, 2015.

EMILY B. FOX

OTHER PUBLICATIONS

Information Fusion and Uncertainty Management for Biological Multisensor Systems.

Jerome J. Braun, Yan Glina, David W. Stein, Peter Skomoroch, & Emily B. Fox,
Proceedings of SPIE, vol. 5813, March 2005.

Multisensor Information Fusion for Biological Sensor Networks and CBRN Detection.

Jerome J. Braun, Yan Glina, David W. Stein, & Emily B. Fox,
Conference on Science and Technology Chem-Bio Information Systems, October 2004.

KEYNOTES, PLENARIES AND TUTORIALS

Computational Approaches for Large-Scale Time Series

Plenary, Bayes Comp 2020, Gainesville, Florida. Jan. 2020

Models of Cognition: From Predicting Cognitive Impairment to the Brain Networks underlying Complex Behaviors

Keynote, NeurIPS Machine Learning for Health (ML4H) Workshop, Vancouver, Canada. Dec. 2019

Flexibility, Interpretability, and Scalability in Time Series Modeling

Keynote, KDD Workshop on Mining and Learning in Time Series, Anchorage, AK. Aug 2019

Beyond Prediction on Big Data: Interpretable Models for Complex Time Series

Keynote, SIAM International Conference on Data Mining (SDM) May 2019
Keynote, Machine Learning and Data Science Symposium, Microsoft, Redmond, WA. June 2018
Keynote, Forecasting Workshop, Amazon Machine Learning Conference, Seattle, WA. April 2018
Keynote, StatFoo, Google, Mountain View, CA. April 2018
Keynote, UW Data Science Summit, Seattle, WA. April 2018
Keynote, Apple Machine Learning Summit, Cupertino, CA. Mar. 2018

Machine Learning for Analyzing Complex Time Series

Keynote, NABE Tech Economics Conference, Seattle, WA. Nov. 2017

Streaming Inference for Dependent Data

Plenary, Brazilian Meeting on Bayesian Statistics, Belo Horizonte, Brazil. Feb. 2016

Bayesian Time Series Modeling: Structured Representations for Scalability

Tutorial, International Conf. on Machine Learning (ICML), Lille, France. July 2015

Scalable Modeling and Inference for Complex Data Streams

Plenary, 10th Conference on Bayesian Nonparametrics, Raleigh, NC. June 2015

Bayesian and Bayesian Nonparametric Dynamic Modeling of Neuroimaging Data

Plenary Tutorial, Intl. Workshop on Pattern Recognition in NeuroImaging (PRNI), Stanford, CA. June 2015

Bayesian Nonparametrics for Time Series

Plenary, Statistical Pattern Recognition, CIMAT, Guanajuato, Mexico. Sept. 2012

INVITED RESEARCH TALKS

The Joys and Perils of Leveraging Mechanistic Models in Health ML: From Type 1 Diabetes to COVID-19

Women in Data Science (WiDS) Technical Vision Talk, Virtual. Mar. 2021
AAAI Workshop: Trustworthy AI for Healthcare Feb. 2021

EMILY B. FOX

- Stochastic Gradient MCMC for Sequential Data Sources***
Advances in Approximate Bayesian Inference, Vancouver, Canada. Dec. 2019
- Flexibility, Interpretability, and Scalability in Time Series Modeling***
Department of Statistics Neyman Seminar, UC Berkeley, Berkeley, CA. Oct. 2019
Department of Statistics, Stanford University, Palo Alto, CA. Mar 2019
- Sparse Neural Networks for Interpretability and Handling Limited Data***
IPAM Workshop on Deep Geometric Learning of Big Data and Applications, Los Angeles, CA. May 2019
NIPS Workshop on Integration of Deep Learning Theories, Montreal, Canada. Dec 2018
- Beyond Prediction on Big Data: Interpretable models for complex time series***
GeekWire Cloud Tech Summit, Seattle, WA. June 2018
- Machine Learning for Analyzing Neuroimaging Time Series***
Department of Biostatistics, Department of Statistics, Data Science Initiative, Harvard University, Cambridge, MA. Mar. 2018
- Interpretable Neural Network Models for Granger Causality Discovery***
IPAM New Deep Learning Techniques Workshop, University of California, Los Angeles, CA. Feb. 2018
- Stochastic Gradient MCMC for Independent and Dependent Data Sources***
Computational Challenges in Machine Learning, Simons Institute, Berkeley, CA. May 2017
- Sparse Graphs via Exchangeable Random Measures***
NIPS Adaptive and Scalable Nonparametric Methods Workshop, Barcelona, Spain. Dec. 2016
- Functional Connectivity in MEG via Graphical Models of Time Series***
NIPS Brains and Bits Workshop, Barcelona, Spain. Dec. 2016
- Sparse Graphs via CRMs and the Associated MCMC***
Department of Statistical Science, Duke University, Durham, NC. Nov. 2016
- Machine Learning for Analyzing Complex Time Series***
Frontiers of Science, University of Washington, Seattle, WA. Jan. 2017
Microsoft Machine Learning, Analytics, & Data Science Conference, Redmond, WA. Nov. 2016
Department of Computer Science & Engineering, University of Washington, Seattle, WA. Oct. 2016
Data Science Summit, San Francisco, CA. July 2016
- Scalable Bayesian Models of Interacting Time Series***
Department of Statistics, UCLA, Los Angeles, CA. Apr. 2017
Department of Biostatistics, University of Michigan, WI. May 2016
Center for Statistics and Machine Learning, Princeton University, Princeton, NJ. Apr. 2016
Department of Applied Mathematics & Statistics, Johns Hopkins, Baltimore, MD. Apr. 2016
- Bayesian Models of Sparse Random Graphs and Graphs of Time Series***
Microsoft Research, Machine Learning Seminar, Cambridge, MA. Mar. 2016
NIPS Workshop on Networks in the Social and Information Sciences, Montreal, Canada. Dec. 2015
- Scalable Bayesian Dynamical Modeling***
Statistical Inference under the Willskyian Lens, MIT, Cambridge, MA. Mar. 2016
- Automatically Parsing iEEG using Bayesian Nonparametric Dynamic Models***
CSNE Kavli Seminar, University of Washington, Seattle, WA. Feb. 2016
- Bayesian Time Series: Structured Representations for Scalability***
NIPS Time Series Workshop, Montreal, Canada. Dec. 2015

EMILY B. FOX

- Variational Inference for Large-Scale and Streaming Sequential Data*
NIPS Workshop on Advances in Approximate Bayesian Inference, Montreal, Canada. Dec. 2015
- A Framework for Devising Stochastic Gradient MCMC Algorithms*
NIPS Workshop on Scalable Monte Carlo Methods, Montreal, Canada. Dec. 2015
- Bayesian and Bayesian Nonparametric Dynamic Modeling of Neuroimaging Data*
CRCNS Workshop, Seattle, WA. Sept. 2015
Integrated Brain Imaging Center, University of Washington, Seattle, WA. July 2015
- Bayesian Nonparametric Dynamic Modeling*
CogSci 2015, Pasadena, CA. July 2015
- Scaling Up to Meet the Demands of Big Data: Challenges and Solutions*
Data Science Data Sense Symposium, Seattle, WA. May 2015
- Scalable Representational Structures for Bayesian Time Series Modeling*
Amazon Faculty Invitational Research Symposium, Seattle, WA. May. 2015
- Scalable Bayesian Dynamic Modeling and Inference for Neuroimaging Data*
University of Washington Institute of Neuroengineering, Seattle, WA. Mar. 2015
- Leveraging Optimization Techniques to Scale Bayesian Inference*
CSML Master Class, University College London, UK. July 2015
Trends in Optimization Seminar, University of Washington, Seattle, WA. Feb. 2015
- Stochastic Variational Inference for Hidden Markov Models*
Information Theory & Applications (ITA), La Jolla, CA. Feb. 2015
- Scaling Bayesian Inference via Stochastic Gradients*
University of Chicago Booth School of Business, Econ. & Statistics Colloquium, Chicago, IL. Nov. 2014
- 2-for-1: Stochastic Gradient HMC and Bayesian Learning of DPP Kernels*
Advances in Scalable Bayesian Computing, Banff, Canada. Mar. 2014
- Determinantal Point Processes on Continuous or Large, Countable Spaces*
BNPSki Workshop, Chamonix, France. Jan. 2014
Bayesian Nonparametrics Workshop, Amsterdam, Netherlands. June 2013
- Multiresolution Gaussian Processes*
59th ISI World Statistics Congress, Hong Kong. Aug. 2013
Information Theory & Applications (ITA) Workshop, San Diego, CA. Feb. 2013
ICERM Bayesian Nonparametrics Workshop, Providence, RI. Sept. 2012
ISBA World Meeting, Kyoto, Japan. June 2012
- Bayesian Dynamic Modeling: Sharing Information Across Time and Space*
Computational Biology Division, Hutch Cancer Research Institute, Seattle, WA. Feb. 2014
Institute for Health Metrics and Evaluation, Seattle, WA. Oct. 2013
Bayesian Nonparametric NIPS Workshop, Tahoe, NV. Dec. 2012
Women in Machine Learning Workshop, Tahoe, NV. Dec. 2012
Zillow, Seattle, WA. Nov. 2012
Department of Computer Science and Engineering, University of Washington, Seattle, WA. Nov. 2012
UW/MSR Machine Learning Workshop, Bellevue, WA. Oct. 2012
- Capturing Heteroscedasticity and Long-Range Dependencies with Gaussian Processes*
MCMSki Workshop, Chamonix, France. Jan. 2014
Department of Biostatistics, MD Anderson Cancer Center, Houston, TX. Nov. 2012

EMILY B. FOX

Division of Statistics and Scientific Computing, University of Texas, Austin, TX.	Nov. 2012
<i>Gaussian Processes on the Brain</i>	
Pacific Northwest Computational Neuroscience Connection, Seattle, WA.	Sept. 2012
<i>Bayesian Covariance Regression and Autoregression</i>	
SILO Seminar, University of Wisconsin, Madison, WI.	Nov. 2012
Econometrics Seminar, University of Pennsylvania, Philadelphia, PA.	Mar. 2012
Department of Statistics, Carnegie Mellon University, Pittsburgh, PA.	Jan. 2012
Department of Statistics, Stanford University, Stanford, CA.	Jan. 2012
Department of Statistics, Hebrew University, Jerusalem, Israel.	Nov. 2011
Department of Computer Science, Princeton University, Princeton, NJ.	Nov. 2011
Department of Statistics, The Wharton School, University of Pennsylvania, Philadelphia, PA.	Sept. 2011
<i>Inverse Wishart AR Processes and Covariance Regression</i>	
Joint Statistical Meeting (JSM) IMS Invited Session, Miami Beach, FL.	Aug. 2011
5 th Brazilian Conference on Statistical Modeling in Insurance and Finance, Maresias, Brazil.	May 2011
<i>Bayesian Nonparametric Covariance Regression</i>	
Bayesian Nonparametric Workshop, Veracruz, Mexico.	June 2011
Conference in Honour of Adrian F.M. Smith, Crete, Greece.	May 2011
ENAR, Miami, FL.	Mar. 2011
<i>Bayesian Nonparametric Learning of Complex Dynamical Phenomena</i>	
GRASP Seminar, University of Pennsylvania, Philadelphia, PA.	Mar. 2012
Center for Language and Speech Processing, Johns Hopkins University, Baltimore, MD.	Feb. 2012
Department of Statistics, University of Washington, Seattle, CA.	Jan. 2012
Department of Statistics, Stanford University, Stanford, CA.	Aug. 2011
Department of Statistics, Carnegie Melon University, Pittsburgh, PA.	Nov. 2010
IPAM Machine Reasoning Workshop, Los Angeles, CA.	Sept. 2010
ISBA 2010 World Meeting, Benidorm, Spain.	June 2010
Department of Statistics, University of Chicago, Chicago, IL.	Feb. 2010
Department of Statistics, Columbia University, New York, NY.	Feb. 2010
Department of Statistical Science, Duke University, Durham, NC.	Jan. 2010
Department of Statistics, Harvard University, Cambridge, MA.	Jan. 2010
Department of Statistics, The Wharton School, University of Pennsylvania, Philadelphia, PA.	Jan. 2010
Information Sciences and Systems Seminar, Princeton University, Princeton, NJ.	Oct. 2009
<i>Bayesian Nonparametric Markov Switching Processes</i>	
Bayesian Inference in Econometrics and Statistics (SBIES), Austin, TX.	May 2010
<i>Sharing Features among Dynamical Systems with Beta Processes</i>	
Penn Research in Machine Learning (PRIML) Kickoff Colloquium, Philadelphia, PA.	Oct. 2010
<i>A Nonparametric Bayesian Approach to the Speaker Diarization Task</i>	
MIT Spoken Language Systems Group Seminar, Cambridge, MA.	April 2009
<i>Nonparametric Bayesian Learning of Switching Dynamical Processes</i>	
MIT Lincoln Laboratory Decision Modeling Research Initiative Seminar, Lexington, MA.	Feb. 2009
Information Processing Systems Seminar, The Ohio State University, Columbus, OH.	Nov. 2008
Department of Statistical Science, Duke University, Durham, NC.	Nov. 2008
Machine Learning Group Seminar, Cambridge University, Cambridge, England.	July 2008
Joint ICML/UAI/COLT Nonparametric Bayesian Workshop, Helsinki, Finland.	July 2008

EMILY B. FOX

- A Sticky HDP-HMM for Systems with State Persistence* Feb. 2008
Harvard University Division of Engineering and Applied Sciences, Cambridge, MA.
- Tracking a Non-Cooperative Maneuvering Target Using Hierarchical Dirichlet Processes* June 2007
Adaptive Sensor Array Processing Workshop, Lexington, MA.
- Nonparametric Bayesian Methods for Large-Scale Target Tracking* Nov. 2006
Heterogeneous Sensor Networks (HSN) meeting, UC Berkeley, CA.

SERVICE & PROFESSIONAL ACTIVITIES

Conference Chairing Neural Information Processing Systems (NeurIPS 2019, program co-chair)

Associate Editor

- SIAM Journal on Mathematics of Data Science (2018-2019)
- Journal of Machine Learning Research (Editorial Board: 2013-2016, Action Editor: 2018)
- American Journal of Algorithms and Computing (2012-2015)

Guest Co-Editor IEEE Trans. Pattern Analysis & Machine Learning Special Issue on Bayesian Nonparametrics

Organizing Committee

- BigBayes: Scalable Algorithms and Architectures (JSM 2015, session organizer)
- Bayesian Nonparametrics Workshop 10 (2015, scientific committee)
- Scaling Computations for Bayesian Nonparametrics (ISBA World Meeting 2014, session organizer)
- IMS New Researchers Conference (2014, scientific committee)
- UW/MSR Machine Learning Day (2013, workshop co-organizer)
- Bayesian Nonparametrics: Hope or Hype? (NIPS 2011, workshop co-organizer)

Senior Program Committee Neural Information Processing Systems (NIPS 2013, 2015), Artificial Intelligence and Statistics (AISTATS 2013, 2014, 2015), International Conference on Machine Learning (ICML 2013, 2014, 2015), Uncertainty in Artificial Intelligence (UAI 2012, 2013)

Professional Societies

- Roundtable Member*, National Academy of Sciences Data Science Education Roundtable (2016-2019)
- Ad hoc committee to propose code of professional conduct*, Institute of Mathematical Statistics (2018-2019)
- Secretary*, ISBA Section on Economics, Finance and Business (2012-2014)
- Nominating Committee*, International Society for Bayesian Analysis (ISBA) (2013)
- Savage Award Committee*, International Society for Bayesian Analysis (ISBA) (2015)
- Member*, Institute of Mathematical Statistics (IMS), International Society for Bayesian Analysis (ISBA), Institute of Electrical & Electronics Engineers (IEEE), IEEE Women in Engineering

Journal Reviewer Annals of Statistics, Journal of the Royal Statistical Society: Series B, Journal of the American Statistical Association, Annals of Applied Statistics, Biometrika, Bayesian Analysis, Statistical Science, Statistics and Computing, IEEE Trans. Signal Processing, IEEE Trans. Pattern Analysis & Machine Intelligence, Journal of Machine Learning Research, IEEE Trans. Aerospace and Electronic Systems

Program Committee Member and Conference Reviewer NIPS (2008, 2009, 2010, 2011, 2012), AISTATS (2009, 2010, 2011, 2012), ICML (2010), FUSION (2009)

Grant Review Panelist National Science Foundation, Air Force Office of Scientific Research

University Committees

- Steering Committee*, Big Data and Data Science IGERT (2013-present)
- Steering Committee*, eScience Institute (2013-2016)
- Co-Organizer*, CORE Seminar Series (2013-present)

EMILY B. FOX

Department Committees

Chair, Diversity Committee (2018)

Seminar Organizer (2012/2013, 2013/2014, 2014/2015)

Stat/CSE Faculty Recruiting Committee (2012/2013, 2013/2014, 2014/2015, 2015/2016)

PhD Admissions Committee (2012/2013, assisting 2013/2014 and 2014/2015)

Chair, Machine Learning / Big Data PhD Track (2013/2014, 2014/2015, 2015/2016)

GRANTS AWARDED

TIMELIGHT: Explainability in Time Series

Emily B. Fox, PI

Air Force Office of Scientific Research (AFOSR), FA9550-20-1-0427.

September 1, 2020 – August 31, 2023.

Interpretable End-to-End Streaming Inference in Multi-Agent Environments

Emily B. Fox, PI

Office of Naval Research (ONR), N00014-18-1-2862.

September 1, 2018 – August 31, 2022.

CRCNS: Bayesian Modeling of Interacting Time Series to Discover Cortical Networks Associated with Auditory Processing Dysfunction

Emily B. Fox, Co-PI

National Science Foundation (NSF), IIS-1607468.

September 1, 2016 – August 31, 2019.

Scalable Representational Structures for Complex Multivariate Time Series

Emily B. Fox, PI

Air Force Office of Scientific Research (AFOSR), FA9550-16-1-0038.

November 1, 2015 – October 31, 2018 (extended to 2019).

Streaming Inference for Dependent Data: Making Inferences on-the-fly from Large Complex Data Sources

Emily B. Fox, PI

Office of Naval Research (ONR) Young Investigator Program, N00014-15-1-2380.

June 1, 2015 – May 31, 2018 (extended to 2019).

Alfred P. Sloan Research Fellowship

Emily B. Fox, PI

Alfred P. Sloan Foundation.

September 15, 2015 – September 14, 2017 (extended to 2019).

Scaling up Modeling and Statistical Inference for Massive Collections of Time Series

Emily B. Fox, PI

National Science Foundation (NSF) CAREER Grant, IIS-1350133.

June 15, 2014 – May 31, 2019.

The TerraSwarm Research Center (TSRC)

Emily B. Fox, Co-PI

MARCO and Defense Advanced Research Programs Agency (DARPA).

January 15, 2013 – October 31, 2017.

Prospective Analysis of Large and Complex Partially Observed Temporal Social Networks

Emily B. Fox, Co-PI

Defense Advanced Research Programs Agency (DARPA) Prime FA9550-12-1-0406.

July 1, 2012 – June 30, 2016.

EMILY B. FOX

Bayesian Tracking Within a Feedback Sensing Environment: Estimating Interacting, Spatially Constrained Complex Dynamical Systems from Multiple Sources of Controllable Devices

Emily B. Fox, PI

Air Force Office of Scientific Research (AFOSR), FA9550-10-1-0501 and FA9550-12-1-0453.

September 1, 2010 – September 14, 2015.

GIFTS RECEIVED

Inferring Functional Connectivity from MEG using Interpretable Deep Dynamical Models

Emily B. Fox, co-PI

Amazon AWS Machine Learning Research Award.

Bayesian Approaches to Time Series Data Analysis

Emily B. Fox, PI

Zillow, Inc.

Highly Multivariate Time Series Analysis from Sparse, Heterogeneous Data Sources

Emily B. Fox, PI

Bosch Corporation.