



Emily Fox

Professor of Statistics and of Computer Science

 Curriculum Vitae available Online

Bio

BIO

Emily Fox is a Professor in the Department of Statistics and, by courtesy, Computer Science at Stanford University. Prior to Stanford, she was the Amazon Professor of Machine Learning in the Paul G. Allen School of Computer Science & Engineering and Department of Statistics at the University of Washington. From 2018-2021, Emily led the Health AI team at Apple, where she was a Distinguished Engineer. Before joining UW, Emily was an Assistant Professor at the Wharton School Department of Statistics at the University of Pennsylvania. She earned her doctorate from Electrical Engineering and Computer Science (EECS) at MIT where her thesis was recognized with EECS' Jin-Au Kong Outstanding Doctoral Thesis Prize and the Leonard J. Savage Award for Best Thesis in Applied Methodology.

Emily has been awarded a CZ Biohub Investigator Award, Presidential Early Career Award for Scientists and Engineers (PECASE), a Sloan Research Fellowship, ONR Young Investigator Award, and NSF CAREER Award. Her research interests are in large-scale Bayesian dynamic modeling, interpretability and computations, with applications in health and computational neuroscience.

ACADEMIC APPOINTMENTS

- Professor, Statistics
- Professor, Computer Science
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Investigator Award, CZ Biohub (2022)
- AWS Machine Learning Research Award, Amazon (2018)
- Presidential Early Career Award in Science & Engineering, National Science Foundation (2017)
- Sloan Research Fellowship, Alfred P. Sloan Foundation (2015)
- Young Investigator Award, Office of Naval Research (2015)
- CAREER Award, National Science Foundation (2014)
- Jin-Au Kong Outstanding Doctoral Thesis Prize, MIT EECS (2009)
- Leonard J. Savage Award for Best Thesis in Applied Methodology, International Society for Bayesian Analysis (2009)

PROFESSIONAL EDUCATION

- Ph.D., Massachusetts Institute of Technology (MIT) , Electrical Engineering and Computer Science (2009)
- E.E., Massachusetts Institute of Technology (MIT) , Electrical Engineering and Computer Science (2008)

- M.Eng., Massachusetts Institute of Technology (MIT) , Electrical Engineering and Computer Science (2005)
- S.B., Massachusetts Institute of Technology (MIT) , Electrical Science and Engineering (2004)

LINKS

- <https://emilybfox.su.domains>: <https://emilybfox.su.domains>

Teaching

COURSES

2022-23

- Introduction to Time Series Analysis: STATS 207, STATS 307 (Aut)
- Modern Applied Statistics: Learning II: STATS 315B (Spr)

2021-22

- Introduction to Time Series Analysis: STATS 207, STATS 307 (Aut)
- Modern Applied Statistics: Learning II: STATS 315B (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Rastko Ciric, Johannes Ferstad, Annette Jing, Dieterich Lawson

Doctoral Dissertation Advisor (AC)

Yujin Jeong

Master's Program Advisor

Charles Lin, Khaing Mon, Ricky Parada

Doctoral (Program)

Alex Wang

Publications

PUBLICATIONS

- **A pharmacokinetic model of anti-seizure medication load to guide care in the Epilepsy Monitoring Unit.** *Epilepsia*
Ghosn, N. J., Xie, K., Pattnaik, A. R., Gugger, J. J., Ellis, C. A., Sweeney, E., Fox, E., Bernabei, J. M., Johnson, J., Boccanfuso, J., Litt, B., Conrad, E. C.
2023
- **A Platform for the Personalized Management of Diabetes and Cardiovascular Disease at Population Scale With Data From Multiple Sensors**
Senanayake, R., Ferstad, J. O., Thapa, I., Giammarino, F., Vasu, M., Zaharieva, D., Prahalad, P., Maahs, D. M., Rosenthal, D. N., Rodriguez, F., Bambos, N., Miller, D., Shin, et al
LIPPINCOTT WILLIAMS & WILKINS.2022
- **Statistical Deconvolution for Inference of Infection Time Series** *EPIDEMIOLOGY*
Miller, A. C., Hannah, L. A., Futoma, J., Foti, N. J., Fox, E. B., D'Amour, A., Sandler, M., Saurous, R. A., Lewnard, J. A.
2022; 33 (4): 470-479
- **The Association between Patient Characteristics and the Efficacy of Remote Patient Monitoring and Messaging**
Ferstad, J., Prahalad, P., Maahs, D. M., Fox, E., Johari, R., Scheinker, D.
AMER DIABETES ASSOC.2022
- **Granger Causality: A Review and Recent Advances** *ANNUAL REVIEW OF STATISTICS AND ITS APPLICATION*
Shojaie, A., Fox, E. B.

2022; 9: 289-319

- **Adding glyceemic and physical activity metrics to a multimodal algorithm-enabled decision-support tool for type 1 diabetes care: Keys to implementation and opportunities.** *Frontiers in endocrinology*
Zaharieva, D. P., Senanayake, R., Brown, C., Watkins, B., Loving, G., Prahalad, P., Ferstad, J. O., Guestrin, C., Fox, E. B., Maahs, D. M., Scheinker, D.
2022; 13: 1096325
- **Neural Granger Causality** *IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE*
Tank, A., Covert, I., Foti, N., Shojaie, A., Fox, E. B.
2021; 44 (8): 4267-4279
- **Improving Reproducibility in Machine Learning Research (A Report from the NeurIPS 2019 Reproducibility Program)** *JOURNAL OF MACHINE LEARNING RESEARCH*
Pineau, J., Vincent-Lamarre, P., Sinha, K., Lariviere, V., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Larochelle, H.
2021; 22
- **The Convex Mixture Distribution: Granger Causality for Categorical Time Series** *SIAM JOURNAL ON MATHEMATICS OF DATA SCIENCE*
Tank, A., Li, X., Fox, E. B., Shojaie, A.
2021; 3 (1): 83-112
- **Adaptively Truncating Backpropagation Through Time to Control Gradient Bias**
Aicher, C., Foti, N. J., Fox, E. B., Adams, R. P., Gogate
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2020: 799-808
- **sgmcmc: An R Package for Stochastic Gradient Markov Chain Monte Carlo** *JOURNAL OF STATISTICAL SOFTWARE*
Baker, J., Fearnhead, P., Fox, E. B., Nemeth, C.
2019; 91 (3): 1-27
- **Control variates for stochastic gradient MCMC** *STATISTICS AND COMPUTING*
Baker, J., Fearnhead, P., Fox, E. B., Nemeth, C.
2019; 29 (3): 599-615
- **Statistical model-based approaches for functional connectivity analysis of neuroimaging data** *CURRENT OPINION IN NEUROBIOLOGY*
Foti, N. J., Fox, E. B.
2019; 55: 48-54
- **DYNAMICS OF HOMELESSNESS IN URBAN AMERICA** *ANNALS OF APPLIED STATISTICS*
Glynn, C., Fox, E. B.
2019; 13 (1): 573-605
- **Stochastic Gradient MCMC for State Space Models** *SIAM JOURNAL ON MATHEMATICS OF DATA SCIENCE*
Aicher, C., Ma, Y., Foti, N. J., Fox, E. B.
2019; 1 (3): 555-587
- **Irreversible samplers from jump and continuous Markov processes** *STATISTICS AND COMPUTING*
Ma, Y., Fox, E. B., Chen, T., Wu, L.
2019; 29 (1): 177-202
- **A Simple Adaptive Tracker with Reminiscences**
Xie, C., Fox, E., Harchaoui, Z., IEEE, Howard, A., Althoefer, K., Arai, F., Arrichiello, F., Caputo, B., Castellanos, J., Hauser, K., Isler, Kim, J., Liu, et al
IEEE.2019: 6596-6603
- **oi-VAE: Output Interpretable VAEs for Nonlinear Group Factor Analysis**
Ainsworth, S. K., Foti, N. J., Lee, A. C., Fox, E. B., Dy, J., Krause, A.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2018
- **Large-Scale Stochastic Sampling from the Probability Simplex**
Baker, J., Fearnhead, P., Fox, E. B., Nemeth, C., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Sparse graphs using exchangeable random measures** *JOURNAL OF THE ROYAL STATISTICAL SOCIETY SERIES B-STATISTICAL METHODOLOGY*

-
- Caron, F., Fox, E. B.
2017; 79 (5): 1295-1366
- **CLUSTERING CORRELATED, SPARSE DATA STREAMS TO ESTIMATE A LOCALIZED HOUSING PRICE INDEX** *ANNALS OF APPLIED STATISTICS*
Ren, Y., Fox, E. B., Bruce, A.
2017; 11 (2): 808-839
 - **Stochastic Gradient MCMC Methods for Hidden Markov Models**
Ma, Y., Foti, N. J., Fox, E. B., Precup, D., Teh, Y. W.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2017
 - **Comment: Nonparametric Bayes Modeling of Populations of Networks** *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*
Foti, N. J., Fox, E. B.
2017; 112 (520): 1539-1543
 - **Temporal behavior of seizures and interictal bursts in prolonged intracranial recordings from epileptic canines** *EPILEPSIA*
Ung, H., Davis, K. A., Wulsin, D., Wagenaar, J., Fox, E., McDonnell, J. J., Patterson, N., Vite, C. H., Worrell, G., Litt, B.
2016; 57 (12): 1949-1957
 - **SPATIO-TEMPORAL LOW COUNT PROCESSES WITH APPLICATION TO VIOLENT CRIME EVENTS**
Aldor-Noiman, S., Brown, L. D., Fox, E. B., Stine, R. A.
STATISTICA SINICA.2016: 1587-1610
 - **A novel seizure detection algorithm informed by hidden Markov model event states** *JOURNAL OF NEURAL ENGINEERING*
Baldassano, S., Wulsin, D., Ung, H., Blevins, T., Brown, M., Fox, E., Litt, B.
2016; 13 (3): 036011
 - **Mining continuous intracranial EEG in focal canine epilepsy: Relating interictal bursts to seizure onsets** *EPILEPSIA*
Davis, K. A., Ung, H., Wulsin, D., Wagenaar, J., Fox, E., Patterson, N., Vite, C., Worrell, G., Litt, B.
2016; 57 (1): 89-98
 - **Bayesian Nonparametric Covariance Regression** *JOURNAL OF MACHINE LEARNING RESEARCH*
Fox, E. B., Dunson, D. B.
2015; 16: 2501-2542
 - **Guest Editors' Introduction to the Special Issue on Bayesian Nonparametrics** *IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE*
Adams, R. P., Fox, E. B., Sudderth, E. B., Teh, Y.
2015; 37 (2): 209-211
 - **A Complete Recipe for Stochastic Gradient MCMC**
Ma, Y., Chen, T., Fox, E. B., Cortes, C., Lawrence, N. D., Lee, D. D., Sugiyama, M., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2015
 - **Streaming Variational Inference for Bayesian Nonparametric Mixture Models**
Tank, A., Foti, N. J., Fox, E. B., Lebanon, G., Vishwanathan, S. V.
MICROTOME PUBLISHING.2015: 968-976
 - **Bayesian Structure Learning for Stationary Time Series**
Tank, A., Foti, N. J., Fox, E. B., Meila, M., Heskes, T.
AUAI PRESS.2015: 872-881
 - **Modeling the complex dynamics and changing correlations of epileptic events** *ARTIFICIAL INTELLIGENCE*
Wulsin, D. F., Fox, E. B., Litt, B.
2014; 216: 55-75
 - **A BAYESIAN APPROACH FOR PREDICTING THE POPULARITY OF TWEETS** *ANNALS OF APPLIED STATISTICS*
Zaman, T., Fox, E. B., Bradlow, E. T.
2014; 8 (3): 1583-1611

- **JOINT MODELING OF MULTIPLE TIME SERIES VIA THE BETA PROCESS WITH APPLICATION TO MOTION CAPTURE SEGMENTATION** *ANNALS OF APPLIED STATISTICS*
Fox, E. B., Hughes, M. C., Sudderth, E. B., Jordan, M. I.
2014; 8 (3): 1281-1313
- **Expectation-Maximization for Learning Determinantal Point Processes**
Gillenwater, J., Kulesza, A., Fox, E., Taskar, B., Ghahramani, Z., Welling, M., Cortes, C., Lawrence, N. D., Weinberger, K. Q.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2014
- **Stochastic Variational Inference for Hidden Markov Models**
Foti, N. J., Xu, J., Laird, D., Fox, E. B., Ghahramani, Z., Welling, M., Cortes, C., Lawrence, N. D., Weinberger, K. Q.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2014
- **Learning the Parameters of Determinantal Point Process Kernels**
Affandi, R., Fox, E. B., Adams, R. P., Taskar, B., Xing, E. P., Jebara, T.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2014: 1224-1232
- **Stochastic Gradient Hamiltonian Monte Carlo**
Chen, T., Fox, E. B., Guestrin, C., Xing, E. P., Jebara, T.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2014: 1683-1691
- **Representing Documents Through Their Readers**
El-Arini, K., Xu, M., Fox, E. B., Guestrin, C., ACM
ASSOC COMPUTING MACHINERY.2013: 14-22
- **A STICKY HDP-HMM WITH APPLICATION TO SPEAKER DIARIZATION** *ANNALS OF APPLIED STATISTICS*
Fox, E. B., Sudderth, E. B., Jordan, M. I., Willsky, A. S.
2011; 5 (2A): 1020-1056
- **Bayesian Nonparametric Inference of Switching Dynamic Linear Models** *IEEE TRANSACTIONS ON SIGNAL PROCESSING*
Fox, E., Sudderth, E. B., Jordan, M. I., Willsky, A. S.
2011; 59 (4): 1569-1585
- **Bayesian Nonparametric Methods for Learning Markov Switching Processes** *IEEE SIGNAL PROCESSING MAGAZINE*
Fox, E. B., Sudderth, E. B., Jordan, M. I., Willsky, A. S.
2010; 27 (6): 43-54