

Elizabeth M. Hou

[hou.elizabeth@gmail.com](mailto:houlizbeth@gmail.com)

<http://lizardintelligence.net>

Education

University of Michigan, Ann Arbor

Ann Arbor, MI

Ph.D. Electrical Engineering and Computer Science

July 2019

Advisor: Alfred O. Hero

M.A. Statistics

May 2015

University of California, Berkeley

Berkeley, CA

B.A. Statistics

May 2012

Research Interests

Statistical Machine Learning, Sequential / Online Learning, Geometry and Optimization in Bayesian Models, Anomaly Detection

Programming Languages

MATLAB, Python, R, C/C++, SQL, SPARQL, CUDA/OpenCL, OpenMP, VBA, Bloomberg

Work and Research Experience

Systems & Technology Research (STR)

Woburn, MA

Lead Research Scientist

July 2019-Present

- Leading a technical area on a DARPA project involving novel probabilistic reasoning over knowledge graphs
- Developing a Probabilistic Neural Network model for accurate uncertainty measurements
- Participate in proposals

Los Alamos National Labs

Los Alamos, NM

Graduate Research Associate

Summers (2015-2018)

- Developed a penalized ensemble Kalman Filter for high-dimensional non-linear systems and variational methods for fast approximation of posteriors

University of Michigan

Ann Arbor, MI

Consortium for Verification Technology Fellow

Aug 2014-July 2019

- Developed sequential and anomaly detection models with significant contributions to the field and applications to nuclear nonproliferation (see publications)

Research Assistant

July 2014-April 2015

- Data and time series analysis on sentiment from Twitter data and Survey of Consumers archive

Graduate Student Instructor

Sept 2013-May 2014

- Prepared, taught, and held office hours for two lab sections (per semester) of Stats 250: Introduction to Statistics

Gifford Fong Associates

Lafayette, CA

Quantitative Financial Analyst

Mar 2012-Jun 2013

- Researched and implemented models for valuation of fixed income products, handled client phone calls and emails from major banks about models

University of California, San Francisco

San Francisco, CA

Computational Research Assistant

Jun 2011-Nov 2011

- Developed more computationally efficient code to do pairwise comparisons, with Mutual Information and other distance metrics, in parallel using C and CUDA/OpenCL
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Publications

E. Hou, E. Lawrence, and A. O. Hero, "Penalized Ensemble Kalman Filters for High Dimensional Non-linear Systems." (in review PLOS ONE) *arXiv preprint arXiv:1610.00195*.

E. Hou, Y. Yilmaz and A. O. Hero, "Anomaly Detection in Traffic Networks", *IEEE Transactions on Signal Processing* (2019).

E. Hou and A. O. Hero, "Sequential Maximum Margin Classifiers for Partially Labeled Data", *2018 IEEE International Conference on Acoustics, Speech and Signal Processing*.

E. Hou, K. Sricharan, and A. O. Hero, "Latent Laplacian Maximum Entropy Discrimination for Detection of High-Utility Anomalies", *IEEE Transactions on Information Forensics and Security* (2018).

E. Hou, Y. Yilmaz and A. O. Hero, "Diversion Detection in Partially Observed Nuclear Fuel Cycle Networks", *ANS Advances in Nuclear Nonproliferation Technology and Policy Conference* (2016).

Y. Yilmaz, **E. Hou** and A. O. Hero, "Online Diversion Detection in Nuclear Fuel Cycles via Multimodal Observations", *ANS Advances in Nuclear Nonproliferation Technology and Policy Conference* (2016).

J. Arroyo and **E. Hou** (equal contribution), "Efficient distributed estimation of inverse covariance matrices", *2016 IEEE Statistical Signal Processing Workshop (SSP), Palma de Mallorca* (2016).

Service

Conference Reviewer: NIPS, ICLR

Journal Reviewer: IEEE TSP, IEEE TNNLS, IEEE TIFS, IEEE IoT, IEEE TNSM, PLOS ONE, SIAM Statistical Analysis & Data Mining, IET Intelligent Transport Systems

Awards