Elizabeth M. Hou

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Education

University of Michigan, Ann Arbor — **Ann Arbor, MI**

Ph.D. Electric Engineering and Computer Science — *Present*

Advisor: Alfred O. Hero

M.A. Statistics — *May 2015*

University of California, Berkeley — **Berkeley, CA**

B.A. Statistics — *May 2012*

Research Interests

Anomaly Detection, Latent Variable Modeling, Optimization in Bayesian Models, Sequential Learning

Programming Languages

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

Work and Research Experience

Los Alamos National Labs — **Los Alamos, NM**

Graduate Research Associate — *July – Oct (2015, 2016)*

- Developed a penalized ensemble Kalman Filter for high-dimensional non-linear systems

University of Michigan — **Ann Arbor, MI**

Consortium of Verification Technology Fellow — *Aug 2014-Present*

- Developing a hierarchical model for estimation and diversion detection in sparse Poisson networks
- Developed a novel method for detecting specific anomalies with partially observed labels

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*

- Performed valuations of structured products, bonds (corp, muni, gov), callable swaps, index-linked and currency-linked notes, bonds with exotic options, and auction-rate preferred securities
- Handled client phone calls and emails from major banks about pricing and explained of model methodology
- Researched and implemented models: to adjust spreads to for tranche-ing in MBS, price callable corporate bonds from non-callable bonds, for default probabilities, liquidity measures for CDOs and other illiquid securities

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

Publications

Hou, E., Sricharan, K., & Hero, A. O. "Latent Laplacian Maximum Entropy Discrimination for Detection of High-Utility Anomalies." *arXiv preprint arXiv:1702.05148 (2017).*

Hou, E., E. Lawrence, and A. O. Hero, "Penalized Ensemble Kalman Filters for High Dimensional Non-linear Systems." *arXiv preprint arXiv:1610.00195 (2016).*

E. Hou, E. Lawrence and A. Hero, "Penalized Ensemble Kalman Filters for High Dimensional Non-linear Systems", *Consortium for Verification Technology Workshop, 2016 (invited)*

E. Hou, Y. Yilmaz and A. 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. 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**, "Efficient distributed estimation of inverse covariance matrices," *2016 IEEE Statistical Signal Processing Workshop (SSP), Palma de Mallorca, 2016, pp. 1-5.*

E. Hou, Y. Yilmaz and A. Hero, “Diversion Detection in Partially Observed Nuclear Fuel Cycle Networks”, *National Nuclear Security Administration UITI Meeting, 2016 (invited)*

E. Hou, E. Lawrence and A. Hero, “Penalized Ensemble Kalman Filters for High Dimensional Non-linear Systems”, *Consortium for Verification Technology Workshop, 2015 (invited)*

E. Hou, T. Van, Y. Yilmaz and A. Hero, “Anomaly Detection in Nuclear Fuel Cycle Networks”, *National Nuclear Security Administration UITI Meeting, 2015 (invited)*

E. Hou, Y. Yilmaz, T. Van, T. Banerjee and A. Hero, “Event Correlation & Anomaly Detection”, *Consortium for Verification Technology Workshop, 2014 (invited)*

Pasek, J., **Hou, E**., Schober, M.F., Conrad, F.G., Lampe, C., & Guggenheim, L. (2015). *Using Twitter data to calibrate retrospective assessments in surveys*. Paper presented at the 70th annual conference of the American Association for Public Opinion Research, Hollywood, FL and the 6th Conference of the European Survey Research Association, Reykjavik, Iceland.

Schober, M.F., Conrad, F.G., Pasek, J., Guggenheim, L., Lampe, C., & **Hou, E**. (2015). *A “collective-vs-self” hypothesis for when Twitter and survey data tell the same story*. Paper presented at the 70th annual conference of the American Association for Public Opinion Research, Hollywood, FL and the 6th Conference of the European Survey Research Association, Reykjavik, Iceland.