Liyan Xie

Assistant Professor, The Chinese University of Hong Kong, Shenzhen
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EDUCATION

Ph.D. in Industrial Engineering, *Georgia Institute of Technology*, 2021.

Major in Statistics, Minor in Operations Research.

Dissertation Title: "Robust Statistical Inference Through the Lens of Optimization."

Thesis Advisor: Yao Xie.

B.Sc. in Statistics, *University of Science and Technology of China*, 2016.

EMPLOYMENT

The Chinese University of Hong Kong, Shenzhen

Assistant Professor, School of Data Science. August 2021 – present.

High-Dimensional Statistical Modeling Unit. RIKEN AIP, Japan.

Research Intern. Mentor: Makoto Yamada. June – August, 2018.

RESEARCH INTERESTS

Mathematical foundation of data science inspired by important applications (sensor networks, health care, etc), with a particular interest in sequential change detection, robust hypothesis test, and generative models.

PUBLICATIONS

Journal Articles (Published or Submitted)

1. Liyan Xie, Yao Xie, and George Moustakides. "Window-limited CUSUM for Sequential Change Detection." In Revision.
2. Minghe Zhang, Liyan Xie, and Yao Xie. "Spectral CUSUM for Online Network Structure Change Detection." Accepted to *IEEE Transactions on Information Theory*, 2023.
3. Xiaojun Zheng, Simon Mak, Liyan Xie, and Yao Xie. "Online High-Dimensional Change-Point Detection using Topological Data Analysis." *Technometrics*, 2022.
4. Haoyun Wang, Liyan Xie, Alex Cuozzo, Simon Mak, and Yao Xie. "Sequential Change-Point Detection for Mutually Exciting Point Processes." *Technometrics*, 2022.
5. Liyan Xie, Shaofeng Zou, Yao Xie, and Venugopal V. Veeravalli. "Sequential Change Detection: Classical Results and New Directions." *IEEE Journal on Selected Areas in Information Theory*, 2021.
6. Liyan Xie and Yao Xie. "Sequential Change Detection by Optimal Weighted ℓ_2 Divergence." *IEEE Journal on Selected Areas in Information Theory*, 2021.
7. Shixiang Zhu, Alexander Bukharin, Liyan Xie, Mauricio Santillana, Shihao Yang, and Yao Xie. "High-Resolution Spatio-Temporal Model for County-level COVID-19 Activity in the US." Accepted, *ACM Transactions on Management Information Systems*.

8. Anatoli Juditsky, Arkadi Nemirovski, Liyan Xie, and Yao Xie."Convex Parameter Recovery for Interacting Marked Processes." *IEEE Journal on Selected Areas in Information Theory*, vol. 1, no. 3, pp. 799-813, 2020.

9. Liyan Xie, George V. Moustakides, and Yao Xie. "Sequential Subspace Changepoint Detection." *Sequential Analysis*, vol. 39, no. 3, pp. 307-335, 2020. (Finalist of INFORMS QSR Best Student Paper Award 2019.)

10. Yang Cao, Liyan Xie, Yao Xie, and Huan Xu."Sequential Change-Point Detection via Online Convex Optimization." *Entropy*, vol. 20, no. 2, pp. 108, 2018.

11. Shixiang Zhu, Alexander Bukharin, Liyan Xie, Shihao Yang, Pinar Keskinocak, and Yao Xie. "Early Detection of COVID-19 Hotspots Using Spatio-Temporal Data." Submitted. Available on arXiv:2106.00072.

Conference Paper Submitted

1. Liyan Xie, Yucheng Liang, and Venugopal Veeravalli. "Data-driven Quickest Change Detection using Wasserstein Uncertainty Sets." Submitted, 2023.

2. Yixuan Tan, Liyan Xie, Xiuyuan Cheng. "Neural Differential Recurrent Neural Networks with Adaptive Time Steps." Submitted, 2023.

3. Yidong Ouyang, Liyan Xie, and Guang Cheng. "Improving Adversarial Robustness by Contrastive Guided Diffusion Process." Submitted, 2022, available on arXiv:2210.09643.

Preprints and Working Paper

1. Liyan Xie, Xi He, Yao Xie, and Pinar Keskinocak. "Graph Based Variable Selection For Survival Analysis."

2. Liyan Xie, Rui Gao, and Yao Xie. "Robust Hypothesis Testing with Wasserstein Uncertainty Sets." arXiv preprint arXiv:2105.14348, 2021. (Runner up for INFORMS Computing Society Student Paper Prize 2019.)

Refereed Conference Proceedings

1. Shixiang Zhu, Liyan Xie, Minghe Zhang, Rui Gao, and Yao Xie. "Distributionally Robust k-Nearest Neighbors for Few-Shot Learning." *Conference on Neural Information Processing Systems (NeurIPS)*, 2022.

2. Liyan Xie. "Minimax Robust Quickest Change Detection using Wasserstein Ambiguity Sets." *IEEE International Symposium on Information Theory (ISIT)*, 2022.

3. Liyan Xie and Yao Xie. "Optimality of Graph Scanning Statistic for Online Community Detection." *IEEE International Symposium on Information Theory (ISIT)*, 2021.

4. Haoyun Wang, Liyan Xie, Alex Cuozzo, Simon Mak, and Yao Xie. "Uncertainty Quantification for Inferring Hawkes Networks." *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.

5. Minghe Zhang, Liyan Xie, and Yao Xie. "Online Community Detection by Spectral CUSUM." *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2020.

6. Liyan Xie, Yao Xie, and George V. Moustakides. "Asynchronous Multi-Sensor Change-Point Detection for Seismic Tremors." *IEEE International Symposium on Information Theory (ISIT)*, pp. 787–791, 2019.

7. Rui Gao, Liyan Xie, Yao Xie, and Huan Xu. "Robust Hypothesis Testing Using Wasserstein Uncertainty Sets." *Advances in Neural Information Processing Systems (NeurIPS)*, pp. 7902–7912, 2018. (spotlight)
8. Liyan Xie, George V. Moustakides, and Yao Xie. "First-Order Optimal Sequential Subspace Change-point Detection." *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, pp. 111–115, 2018.
9. Yang Cao, Liyan Xie, Yao Xie, and Huan Xu."Nearly Second-Order Asymptotic Optimality of Sequential Change-Point Detection with One-Sample Updates." *Proceedings of the Twenty-First International Conference on Artificial Intelligence and Statistics (AISTATS)*, vol. 84, pp. 519–528, 2018.
10. Liyan Xie, Yao Xie, Sin-Mei Wu, Fan-Chi Lin, and WenZhan Song. "Communication Efficient Signal Detection for Distributed Ambient Noise Imaging." *IEEE Asilomar Conference on Signals, Systems, and Computers*, pp. 1779–1783, 2018.
11. Liyan Xie and Yao Xie."Sequential Detection of Low-Rank Changes Using Extreme Eigenvalues." *IEEE 7th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, pp. 1–5, 2017.

AWARDS AND ACHIEVEMENTS

Robert Goodell Brown Fellowship for excellence in research (Data Science and Statistics), ISyE, 2021

IDEaS-TRIAD and ARC-TRIAD Research Fellowships, Georgia Tech, 2020.

Selected to participate in EECS Rising Stars Workshop, 2020.

Outstanding Graduate Teaching Assistant Award, ISyE, 2020.

Tech to Teaching Certificate, obtained Summer 2020.

Runner up for INFORMS Computing Society Student Paper Prize, 2019.

Finalist of INFORMS QSR Best Student Paper Award, 2019.

Poster Awards, Georgia Statistics Day 2019&2018, WuFest Conference 2019.

TEACHING EXPERIENCES

The Chinese University of Hong Kong, Shenzhen

DDA6030: Advanced Statistics Theory, Spring 2022, 2023.

STA2004: Mathematical Statistics, Spring 2023.

DDA2001: Introduction to Data Science, Spring 2022.

STA2002: Probability and Statistics II, Fall 2021.

Georgia Institute of Technology

ISyE 3030: Basic Statistical Methods, Summer 2020.

PROFESSIONAL SERVICE

Journal Referee of IEEE Transactions on Signal Processing, Sequential Analysis, Electronic Journal of Statistics, Journal of the Royal Statistical Society: Series B, Informs Journal on Data Science, etc.

Conference Reviewer for: AAAI, ICML, NeurIPS, AISTATS, ICLR, ISIT, etc.