Lihua Lei

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Education

Postdoctoral Researcher, Stanford University. 9/2019 - present
Advisor: Emmanuel Candès

Ph.D. Statistics, University of California, Berkeley. 8/2014 - 8/2019
Advisors: Peter, J. Bickel, and Michael, I. Jordan.

B.S. Statistics, Peking University. 9/2010 - 6/2014
Undergraduate Thesis Advisor: Song Xi, Chen.

Awards

Eric Lehmann Citation (Annual Dissertation Award in Theoretical Statistics), 2019.

Citadel Fellowship, 2017-2018.

Outstanding Graduate Stundent Instructor Award, 2016.

ICML (International Conference on Machine Learning) Travel Award, 2016.

ACIC (Atlantic Causal Inference Conference) Travel Award, 2018.

Scholarship from The Sally and Terry Speed Graduate Support Fund, 2015.

Teaching Experiences

TA, Statistics 210A, Theoretical Statistics A, Fall 2015 (taught by Michael, I. Jordan).

TA, Statistics 210B, Theoretical Statistics B, Spring 2016 (taught by Martin, J. Wainright).

Research Experiences

Research Interests

Causal Inference; Multiple hypothesis testing; Network analysis;
High dimensional statistical inference; Resampling methods;
Stochastic optimization; Econometrics

Journal Publications

1. **Lei, L.** & Bickel, P. J. (2020) An Assumption-Free Exact Test For Fixed-Design Linear Models With Exchangeable Errors. To appear in *Biometrika*.

2. **Lei, L.**, Ramdas, A., & Fithian, W. (2020) A general interactive framework for FDR control under structural constraints. To appear in *Biometrika*.

3. **Lei, L.** & Jordan, M. I. (2020) On the Adaptivity of Stochastic Gradient-Based Optimization. To appear in *SIAM Journal on Optimization (SIOPT)*.

4. D'Amour, A., Ding, P., Feller, A., **Lei, L.**, & Sekhon, J. (2019) Overlap in High Dimensional Observational Studies. To appear in *Journal of Econometrics (JoE)*.

5. **Lei, L.**, & Fithian, W. (2018). AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *Journal of the Royal Statistical Society: Series B (JRSS-B)*, 80(4), 649-679.

6. **Lei, L.**, Bickel, P. J., & El Karoui, N. (2018). Asymptotics For High Dimensional Regression M-Estimates: Fixed Design Results. *Probability Theory and Related Fields (PTRF)*, 172(3-4), 983-1079.

7. Chen, S. X., **Lei, L.**, & Tu, Y. (2016). Functional Coefficient Moving Average Model with Applications to forecasting Chinese CPI. *Statistica Sinica*, 26, 1649-1672.

Conference Publications

1. Elibol, M., **Lei, L.**, & Jordan, M. I. (2020). Variance Reduction with Sparse Gradients. To appear in *International Conference on Learning Representations (ICLR)*

2. Ye, Y., **Lei, L.**, & Ju, C. (2018). HONES: A Fast and Tuning-free Homotopy Method For Online Newton Step. In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*.

3. **Lei, L.**, Ju, C., Chen, J., & Jordan, M. I. (2017). Nonconvex Finite-Sum Optimization Via SCSG Methods. In *Proceedings of the 30th Advances in Neural Information Processing Systems (Neurips)*.

4. **Lei, L.**, & Jordan, M. I. (2017). Less than a Single Pass: Stochastically Controlled Stochastic Gradient. In *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*.

5. **Lei, L.**, & Fithian, W. (2016). Power of Ordered Hypothesis Testing. In *Proceedings of the 33th International Conference on Machine Learning (ICML)*.

Preprints and Submissions

1. Fithian, W. & **Lei, L.** (2020) Conditional calibration for false discovery rate control under dependence. *ArXiv e-prints, abs/2007.10438*.

2. **Lei, L.** & Candès, E. J. (2020) Conformal Inference of Counterfactuals and Individual Treatment Effects. *ArXiv e-prints, abs/2006.06138*.

3. **Lei, L.**, Li, X. & Lou, X. (2020) Consistency of Spectral Clustering on Hierarchical Stochastic Block Models. *ArXiv e-prints, abs/2004.14531*.

4. Horváth, S., **Lei, L.**, Richtárik, P., & Jordan, M. I. (2020) Adaptivity of Stochastic Gradient Methods for Nonconvex Optimization. *ArXiv e-prints, abs/2002.05359*.

5. Tansey, W., Loper, J. H., **Lei, L.** & Fithian, W. (2019) Smoothed Nested Testing on Directed Acyclic Graphs. *ArXiv e-prints, abs/1911.09200*.

6. **Lei, L.** (2019) Unified $\ell_{2\to\infty}$ Eigenspace Perturbation Theory for Symmetric Random Matrices. *ArXiv e-prints, abs/1909.04798*.

7. Li, T., **Lei, L.**, Bhattacharyya, S., Sarkar, P., Bickel, P. J., & Levina, E. (2019) Hierarchical community detection by recursive partitioning. *ArXiv e-prints, abs/1810.01509*.

8. **Lei, L.** & Ding, P. (2018) Regression Adjustment in Randomized Experiments With A Diverging Number of Covariates. *ArXiv e-prints, abs/1806.07585*.

Softwares

1. `adaptMT`: `R` package on Adaptive P-value Thresholding (on CRAN);

2. `cfcausal`: `R` package on conformal inference of counterfactuals and individual treatment effects (on github);

3. `dbh`: `R` package on dependence-adjusted Benjamini-Hochberg and general step-up procedures (on github);

4. `mkn`: `R` package on multiple knockoffs based inference (on github).

Professional Services

Invited Talks

Conformal Inference of Counterfactuals and Individual Treatment Effects. *At The 2020 Pacific Causal Inference Conference*, Sep. 2020.

Conformal Inference of Counterfactuals and Individual Treatment Effects. *At Online Causal Inference Seminar*, Jul. 2020.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *At International Seminar on Selective Inference*, Jul. 2020.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *At Southwestern University of Finance and Economics*, Jul. 2020.

Conformal Inference of Counterfactuals and Individual Treatment Effects. *At 2020 BAAI Conference*, Jun. 2020.

Fair and Efficient Allocation of Medical Resources During COVID-19. *At Journal Club, Stanford University*, Jun. 2020.

Survival Analysis of COVID-19 Patients. *At Data Studio, Stanford University*, May. 2020.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *At University of California, Berkeley (Michael I. Jordan's group)*, May. 2020.

Fair and Efficient Allocation of Medical Resources During COVID-19. *At University of California, Berkeley (Sandrine Dudoit's group)*, May. 2020.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *At WNAR 2020 Annual Meeting*, Jun. 2020. (Cancelled due to COVID-19).

Unified $\ell_{2\to\infty}$ Eigenspace Perturbation Theory for Symmetric Random Matrices. *At SIAM Conference on Mathematics of Data Science (MDS20)*, May. 2020. (Cancelled due to COVID-19).

BONuS: Adaptive Multiple Testing With Multivariate Test Statistics. *At Banff Workshop*, Mar. 2019. (Cancelled due to COVID-19).

Model-Free Assessment of Overlap in Observational Studies. *At University of California, Berkeley (Causal Reading Group)*, Jan. 2020.

Model-Free Assessment of Overlap in Observational Studies. *SAMSI Workshop At Duke University)*, Dec. 2019.

BONuS: Adaptive Multiple Testing With Multivariate Test Statistics. *At Facebook Core Data Science*, Nov. 2019.

Doubly robust two-way fixed effects regression for panel data. *Third Annual Berkeley-Stanford Econometrics Jamboree)*, Oct. 2019.

Regression Adjustment in Randomized Experiments With A Diverging Number of Covariates. *Joint Statistical Meeting, Topic Contributed Session*, Aug. 2019.

Hierarchical community detection by recursive partitioning. *ICSA Applied Statistics Symposium*, Jun. 2019.

Model-Free Assessment of Overlap in Observational Studies. *At Yale University (Department Seminar)*, Feb. 2019.

Hierarchical community detection by recursive partitioning. *At University of California, Davis (Student Seminar)*, Jan. 2019.

Model-Free Assessment of Overlap in Observational Studies. *At Stanford University (Stefan Wager's group)*, Jan. 2019.

Statistical Inference in Moderate Dimensions. *At University of South California (Department Seminar)*, Dec. 2018.

Hierarchical community detection by recursive bi-partitioning. *At University of Michigan (Liza Levina's group)*, Oct. 2018.

Statistical Inference in Moderate Dimensions. *At University of Michigan (Student Seminar)*, Oct. 2018.

Regression Adjustment in Randomized Experiments With A Diverging Number of Covariates. *At University of Michigan (Xuming He's group)*, Oct. 2018.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *International Conference on Econometrics and Statistics (EcoSta)*, Jun. 2018.

Regression Adjustment in Randomized Experiments With A Diverging Number of Covariates. *Atlantic Causal Inference Conference (ACIC)*, May. 2018.

Stochastically Controlled Stochastic Gradient (SCSG) Method. *At University of California, Davis (Cho-Jui Hsieh's group)*, Mar. 2018.

AdaPT: An Interactive Procedure For Multiple Testing With Side Information. *At Stanford University (David Tse's group)*, Feb. 2018.

Asymptotics For High Dimensional Regression M-Estimates: Fixed Design Results. *Berkeley-Stanford Econometrics Jamboree*, Nov. 2017.

Reviewing

Statistics Journals: (#papers in parentheses) Annals of Statistics (AoS, 3), Journal of the American Statistical Association (JASA, 4), Journal of the Royal Statistical Society-Series A (JRSS-A, 1), Journal of the Royal Statistical Society-Series B (JRSS-B, 3), Bernoulli (1), Electronic Journal of Statistics (EJS, 2), Biometrics (2), Journal of Causal Inference (JCL, 2), Stat (1), Springer Book (1), International Journal of Biostatistics (IJB, 1), SIAM Journal on Mathematics of Data Science (SIMODS, 1)

Other Journals: (#papers in parentheses) Operations Research (1), Management Science (1), Journal of Machine Learning Research (JMLR, 2), Transactions on Pattern Analysis and Machine Intelligence (TPAMI, 2), Computational Optimization and Applications (COAP, 1), Optimization Methods and Software (GOMS, 1), Artificial Intelligence (1)

Conferences: (year in parentheses) ICML (2019, 2020), NeurIPS (2019, 2020), COLT (2019, 2020), AISTATS (2019), UAI (2020)

Other Academic Services

- Co-organizer of the International Seminar on Selective Inference (with Will Fithian, Rina Barber and Daniel Yekutieli).
- Co-organizer of the GRoup-Of-Why (GROW) seminar, a causal reading group at Stanford University (with Guillaume Basse and Dominik Rothenhäusler).
- Co-organizer of the Banff workshop "The Interface Between Selective Inference and Machine Learning" (with Will Fithian, Rina Barber and Daniel Yekutieli, cancelled due to the pandemic).
- Co-organizer of the Banff workshop "Causal Inference with Big Data" (with Peng Ding, Marloes Maathuis and Fabrizia Mealli, cancelled due to the pandemic).