# Adel Javanmard

Professor, Data Sciences and Operations Department
Dean's Professor Chair in Business Administration
Marshall School of Business, University of Southern California
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Google Scholar

## Academic Positions

- **Marshall School of Business, University of Southern California,** Los Angeles, CA.

  **Professor** Nov 2024-present
  Department of Data Sciences and Operations (Statistics group).

  **Dean's Associate Professor Chair in Business Administration** 2024-Present
  Department of Data Sciences and Operations, University of Southern California

  **Associate Professor (with tenure)** April 2021-Nov 2024
  Department of Data Sciences and Operations (Statistics group).

  **Assistant Professor** Jun 2015-April 2021
  Department of Data Sciences and Operations (Statistics group).

- **Viterbi School of Engineering, University of Southern California,** Los Angeles, CA.

  **Associate Professor (by courtesy),** Department of Computer Science. April 2021-Present

  **Assistant Professor (by courtesy),** Department of Computer Science. Jan 2017-April 2021

- **Google Research,** Visiting Faculty Researcher June 2022-Present

- **Simons Institute for the Theory of Computing,** UC Berkeley.

  **Visiting Scientist,** *Foundations of Data Science Program.* Fall 2018

  **Visiting Scientist,** *Information Theory Program.* Spring 2015

- **Center for Science of Information,** Worksite: UC Berkeley, Stanford University 2014-2015

  **NSF Post-Doctoral Research Fellow**

- **Microsoft Corporation,**

  **Research Intern,** Microsoft Research New England Lab, Jun–Sep 2012

  **Research Intern,** Microsoft Research Silicon Valley, Mountain View, CA Jun–Sep 2011

## Education

**Stanford University,** Stanford, CA
Ph.D. in Electrical Engineering, Advisor: *Andrea Montanari, David Donoho* 2010–2014
*Thesis Title:* Inference and Estimation in High-Dimensional Data Analysis

**Stanford University,** Stanford, CA
M.Sc. in Electrical Engineering 2009-2011

**Sharif University of Technology,** Tehran, Iran 2004–2009
B.Sc. in Electrical Engineering

**Sharif University of Technology,** Tehran, Iran 2005–2009
B.Sc. in Mathematics

## Research Interests

- Uncertainty-aware machine learning
- Theoretical understanding of deep learning
- Dynamic and personalized decision-making
- Private/Anonymous learning
- High-dimensional statistical inference
- Non-convex optimization, applied probability, random matrix theory
- Iterative algorithms, graphical models, message passing algorithms, statistical physics

## Distinctions

- **USC Gen AI Faculty Research Award**, 2024
- **Dean's Associate Professor Chair in Business Administration,** USC Marshall, 2024
- **Dean's Award for Research Excellence,** USC Marshall, 2024
- **USC Marshall Outlier Research in Business (iORB) Grant,** 2024.
- **AWS AI Amazon Research Awards,** 2024.
- Annals of Statistics Special Invited Session Speaker at the Joint Statistical Meetings (JSM 2023)
- Invited nominator for **The Shaw Prize** in Mathematical Sciences 2022-2024.
- **Adobe Data Science Faculty Research Award,** 2022.
- **Golden Apple Teaching Award,** USC 2022.
  Teaching award for the most impactful faculty, selected by students' votes.
  Awarded for the core undergraduate course "operations management"
- **Alfred P. Sloan Research Fellow in Mathematics,** 2021.
- **Adobe Data Science Faculty Research Award,** 2020

- **IMS Tweedie New Researcher Award,** Institute of Mathematical Statistics, 2020.
  "for novel contributions in high-dimensional statistical inference, iterative estimation methods, non-convex optimization, and network clustering"
- **NSF CAREER Award,** Division of Mathematical Sciences (Statistics Program), 2019
- **USC Marshall Outlier Research in Business (iORB) Grant,** 2018.
- **Dr. Douglas Basil Award for Junior Business Faculty,** USC Marshall, 2018.
- **Zumberge Individual Award,** USC James H. Zumberge Faculty Research and Innovation Fund, 2017.
- **Google Faculty Research Award,** 2016.
- **Thomas M. Cover Dissertation Award,** IEEE Information Theory Society, 2015.
  Awarded annually to one recipient worldwide for an outstanding doctoral dissertation
- **NSF CSoI Post-Doctoral Research Fellowship,** Center for Science of Information, 2014–2015.
- **Student Paper Award Finalist,** IEEE Intl Symp on Information Theory (ISIT), USA, 2012.
- **Student Paper Award Finalist,** IEEE Intl Symp on Information Theory (ISIT), Russia, 2011.
- **Stanford Graduate Fellowship,** 2010–2013.
- **Stanford Electrical Engineering Fellowship,** 2009–2010.
- **Silver medal,** $45^{\text{th}}$ International Mathematical Olympiad (IMO), Greece, 2004.
- **Gold medal,** National Mathematical Olympiad, Tehran, IRAN, 2003.
- **Bronze medal,** National Mathematical Olympiad, Tehran, IRAN, 2002.

## Scholarly impact

All numbers are based on the candidate's google scholar.

- Total citations to articles: 5,015.
- h-index = 29; i10-index = 43.

## Publications

- Dissertation

**Adel Javanmard**, "*Inference and Estimation in High-dimensional Data Analysis,*" Stanford University Ph.D. Dissertation, July 2014
* *Winner of the 2015 Thomas Cover Dissertation Award from the IEEE Information Theory Society**.

## Journal Publications

1. Simeng Shao, Jacob Bien, **Adel Javanmard**, "*Controlling the False Split Rate in Tree-Based Aggregation,*" To appear in **Journal of American Statistical Association (Theory and Methods)**, 2024.

2. Rashmi Ranjan Bhuyan, **Adel Javanmard**, Sungchul Kim, Gourab Mukherjee, Ryan A. Rossi, Tong Yu, Handong Zhao, "Structured Dynamic Pricing: Optimal Regret in a Global Shrinkage Model", To appear in **Journal of Machine Learning Research**, 2024.

3. **Adel Javanmard**, Mohammad Mehrabi, "GRASP: A Goodness-of-Fit Test for Classification Learning", **Journal of the Royal Statistical Society (Series B),** 86 (1), pp 215-245, 2024.

4. Hamed Hassani, **Adel Javanmard**, "The curse of overparametrization in adversarial training: Precise analysis of robust generalization for random features regression," **The Annals of Statistics,** 52(2), pp 441-465, 2024.

5. **Adel Javanmard**, Mohammad Meharbi, "*Adversarial robustness for latent models: Revisiting the robust-standard accuracies tradeoff,*" Accepted for publication in **Operations research**, 2023.

6. **Adel Javanmard** and Mahdi Soltanolkotabi, "*Precise Statistical Analysis of Classification Accuracies for Adversarial Training,*" The **Annals of Statistics**, 50(4), pp 2127-2156, 2022.

7. Yash Deshpande, **Adel Javanmard**, Mohammad Mehrabi, "*Online Debiasing for Adaptively Collected High-dimensional Data with Applications to Time Series Analysis,*" **Journal of American Statistical Association (Theory and Methods)**, 118, no. 542 (2023): 1126-1139.

8. Negin Golrezaei, **Adel Javanmard** and Vahab Mirrokni, "*Dynamic Incentive-Aware Learning: Robust Pricing in Contextual Auctions,*" **Operations Research**, 69, no. 1 (2021): 297-314.

9. **Adel Javanmard** and Jason D. Lee, "*A Flexible Framework for Hypothesis Testing in High-dimensions,*" **Journal of Royal Statistical Society (Series B)**, 82(3), pp. 685–718, 2020.

10. Ery Arias-Castro, **Adel Javanmard**, Bruno Pelletier, "*Perturbation Bounds for Procrustes, Classical Scaling, and Trilateration, with Applications to Manifold Learning,*" **Journal of Machine Learning Research**, 21(15): pp. 1-37, 2020.

11. **Adel Javanmard**, Marco Mondelli and Andrea Montanari, "*Analysis of a Two-Layer Neural Network via Displacement Convexity,*" **Annals of Statistics**, 48(6): pages 3619-3642, 2020.

12. **Adel Javanmard** and Hamid Javadi, "*False Discovery Rate Control via Debiased Lasso,*" **Electronic Journal of Statistics**, Volume 13, No .1, pages 1212-1253, 2019.

13. David S. Robertson, Jan Wildenhain, **Adel Javanmard**, and Natasha A. Karp, "*onlineFDR: an R package to control the false discovery rate for growing data repositories,*" **Bioinformatics Journal**, Volume 35, Issue 20, Pages 4196–4199, 2019.

14. **Adel Javanmard** and Hamid Nazerzadeh, "*Dynamic pricing in high-dimensions,*" The **Journal of Machine Learning Research** 20, no 1 (2019): 315-363.

15. Mahdi Soltanolkotabi, **Adel Javanmard** and Jason D. Lee "*Theoretical insights into the optimization landscape of over-parameterized shallow neural networks,*" **IEEE Transactions on Information Theory**, 65(2), pages 742-769, 2018.

16. **Adel Javanmard** and Andrea Montanari, "*Debiasing the Lasso: Optimal Sample Size for Gaussian Designs,*" **Annals of Statistics**, Volume 46, No. 6A, pages 2593-2622, 2018.

17. **Adel Javanmard** and Andrea Montanari, "*Online Rules for Control of False Discovery Rate and False Discovery Exceedance,*" **Annals of Statistics**, Vol. 46, No. 2, pages 526-554, 2018.

18. Adel Javanmard "*Perishability of Data: Dynamic pricing under varying-coefficient models,*" **Journal of Machine Learning Research**, 18(53):1-31, 2017.

19. Anand Bhaskar, **Adel Javanmard**, Thomas Courtade, David Tse, "*Novel probabilistic models of spatial genetic ancestry with applications to stratification correction in genome-wide association studies,*" In **Bioinformatics Journal**, March 2017, 33(6), pp. 879-885, doi: 10.1093/bioinformatics/btw720.

20. **Adel Javanmard**, Andrea Montanari and Federico Ricci-Tersenghi, "*Phase Transitions in Semidefinite Relaxations,*" In **Proceedings of the National Academy of Sciences (PNAS)**, 113(16): E2218-E2223, 2016. doi: 10.1073/pnas.1523097113.

21. S. Akbari, A. Daemi, O.Hatami, **A. Javanmard**, A. Mehrabian, "*Nowhere-zero Unoriented Flows in Hamiltonian Graphs,*" **Ars Combinatoria Journal**, 120:51-63, 2015.

22. **Adel Javanmard** and Andrea Montanari, "*Confidence Intervals and Hypothesis Testing for High-Dimensional Regression,*" **Journal of Machine Learning Research**, 15(1): 2869-2909, 2014.

23. **Adel Javanmard** and Andrea Montanari, "*Hypothesis Testing in High-Dimensional Regression under the Gaussian Random Design Model: Asymptotic Theory,*" **IEEE Transaction on Information Theory**, 60(10):6522-6554, 2014.

24. **Adel Javanmard** and Andrea Montanari, "*State Evolution for General Approximate Message Passing Algorithms, with Applications to Spatial Coupling,*" **Information and Inference (A Journal of the IMA)**, 2(2): 115-144, 2013.

25. David L. Donoho, **Adel Javanmard**, and Andrea Montanari, "*Information-Theoretically Optimal Compressed Sensing via Spatial Coupling and Approximate Message Passing,*" **IEEE Transaction on Information Theory**, 59(11):7434-7464, 2013.

26. **Adel Javanmard** and Andrea Montanari, "*Localization from Incomplete Noisy Distance Measurements,*" **Foundations of Computational Mathematics**, 13(3):297-345, June 2013.

27. S. Akbari, A. Daemi, O.Hatami, **A. Javanmard**, A. Mehrabian,"*Zero-Sum Flows in Regular Graphs,*" **Graphs and Combinatorics Journal**, 26(5):603-615, Sep 2010.

28. **Adel Javanmard**, and Farid Ashtiani, "*Analytical Evaluation of Average Delay and Maximum Stable Throughput along a Typical Two-Way Street for Vehicular Ad-Hoc Networks in Sparse Situation,*" **Elsevier Computer Communications**, 32(16):1768-1780, Oct. 2009.

29. G. Hosein Mohimani, Farid Ashtiani, **Adel Javanmard**, and Maziyar Hamdi, "*Mobility Modeling, Spatial Traffic Distribution, and Probability of Connectivity for Sparse and Dense Vehicular Ad Hoc Networks,*" **IEEE Transaction on Vehicular Technology**, 58(4):1998 - 2007, May 2009.

## Conference Publications

1. Gene Li, Lin Chen, **Adel Javanmard**, Vahab Mirrokni, *"Optimistic rates for learning from label proportions",* In The 37th Annual **Conference on Learning Theory (COLT)**, 2024.

2. **Adel Javanmard**, Matthew Fahrbach, Vahab Mirrokni, *"PriorBoost: An Adaptive Algorithm for Learning from Aggregate Responses"*, **International Conference on Machine Learning (ICML)**, 2024.

3. **Adel Javanmard**, Lin Chen, Vahab Mirrokni, Ashwinkumar Badanidiyuru, Gang Fu , *"Learning from Aggregate responses: Instance Level versus Bag Level Loss Functions"*, **International Conference on Learning Representations (ICLR)**, 2024.

4. **Adel Javanmard**, Vahab Mirrokni, *"Anonymous Learning via Look-Alike Clustering: A Precise Analysis of Model Generalization"*, **Annual Conference on Neural Information Processing Systems (NeurIPS)**, 2023.

5. CJ Carey, Travis Dick, Alessandro Epasto, **Adel Javanmard**, Josh Karlin, Shankar Kumar, Vahab Mirrokni, Andres Munoz, Gabriel Nunes, Sergei Vassilvitskii, Peilin Zhong, *"A New Framework for Measuring Re-Identification Risk"*, **NeurIPS 2023 Workshop on Regulatable ML**, 2023.

6. Matthew Fahrbach, **Adel Javanmard**, Vahab Mirrokni, Pratik Worah, *"Learning rate schedules in the presence of distribution shift"*, **International Conference on Machine Learning (ICML)** 2023.

7. CJ Carey, Travis Dick, Alessandro Epasto, **Adel Javanmard**, Josh Karlin, Shankar Kumar, Vahab Mirrokni, Andres Munoz, Gabriel Nunes, Sergei Vassilvitskii, Peilin Zhong, *"Measuring Re-identification Risk"*, Accepted at

   -**ACM SIGMOD/PODS International Conference on Management of Data**, 2023.

   -**SecWeb workshop (Designing security for the Web)**, 2023

8. Mohammad Mehrabi, **Adel Javanmard**, Ryan A. Rossi, Anup Rao, Tung Mai, "*Fundamental Tradeoffs in Distributionally Adversarial Training,*" Proceedings of the 38th **International Conference on Machine Learning (ICML)**, PMLR 139:7544-7554, 2021.

9. **Adel Javanmard**, Mahdi Soltanolkotabi, Hamed Hassani, "*Precise Tradeoffs in Adversarial Training for Linear Regression,*" Proceeding of **Thirty Third Conference on Learning Theory (COLT)**, PMLR 125:2034-2078, 2020.

10. **Adel Javanmard**, Hamid Nazerzadeh and Simeng Shao, "*Multi-Product Dynamic Pricing in High-Dimensions with Heterogenous Price Sensitivity,*" **IEEE International Symposium on Information Theory (ISIT)**, pp. 2652-2657. IEEE, 2020.

11. Negin Golrezaei, **Adel Javanmard** and Vahab Mirrokni, "*Dynamic Incentive-Aware Learning: Robust Pricing in Contextual Auctions,*" Proceeding of **Advances in Neural Information Processing Systems (NeurIPS 2019)** 32, pp: 9759–9769, 2019.

12. **Adel Javanmard** and Hamid Nazerzadeh, "*Dynamic pricing in high-dimensions,*" Conference on **Two-sided Marketplace Optimization: Search, Pricing, Matching & Growth (TSMO)**, 2018.

13. Federico Ricci-Tersenghi, **Adel Javanmard** and Andrea Montanari, "*Performance of a community detection algorithm based on semidefinite programming,*" **Journal of Physics Series** 699(1):1-11, 2016.

14. Sonia Bhaskar and **Adel Javanmard**, "*1-Bit Matrix Completion under Exact Low-Rank Constraint,*" Proceedings of 49th Annual **Conference on Information Sciences and Systems (CISS)**, Baltimore, MD, 2015, pp: 1-6, doi: 10.1109/CISS.2015.7086879, 2015.

15. **Adel Javanmard** and Andrea Montanari, "*Confidence Intervals and Hypothesis Testing for High-Dimensional Regression,*" Proceeding of **Advances in Neural Information Processing Systems (NeurIPS 2013)**, 26, pages 1187-1195, 2013.

16. **Adel Javanmard** and Andrea Montanari, "*Model Selection for High-Dimensional Regression under the Generalized Irrepresentability Condition,*" Proceeding of **Advances in Neural Information Processing Systems (NeurIPS 2013)**, 26, pages 3012-3020, 2013.

17. **Adel Javanmard** and Andrea Montanari, "*Nearly Optimal Sample Size in Hypothesis Testing for High-Dimensional Regression,*" Proceedings of Annual **Allerton Conference** on Communication, Control and Computing, pages 1427-1434, 2013.

18. Animashree Anandkumar, Daniel Hsu, **Adel Javanmard**, and Sham M. Kakade, "*Learning Linear Bayesian Networks with Latent Variables,*" Proceeding of the 30th **International Conference on Machine Learning (ICML 2013)**, 28(1):249-257, 2013.

19. Morteza Ibrahimi, **Adel Javanmard**, and Benjamin Van Roy, "*Efficient Reinforcement Learning for High Dimensional Linear Quadratic Systems,*" Proceeding of **Advances in Neural Information Processing Systems (NeurIPS 2012)**, pages 2645-2653, 2012.

20. **Adel Javanmard** and Andrea Montanari, "*Subsampling at Information Theoretically Optimal Rates,*" Proc. of **IEEE International Symposium on Information Theory (ISIT)**, pages 2431-2435, 2012.

21. David L. Donoho, **Adel Javanmard**, and Andrea Montanari, "*Information-Theoretically Optimal Compressed Sensing via Spatial Coupling and Approximate Message Passing,*" Proceeding of **IEEE International Symposium on Information Theory (ISIT)**, pages 1231-1235, 2012.

22. **Adel Javanmard** and Li Zhang "*The minimax risk of truncated series estimators for symmetric convex polytopes,*" Proceeding of **IEEE International Symposium on Information Theory (ISIT)**, pp 1633-1637, 2012.
(**Best Student Paper Award Finalist**)

23. **Adel Javanmard**, Maya Haridasan, and Li Zhang,"*Multi-track Map Matching*", Proceeding of **International conference on Advances in Geographic Information Systems (SIGSPATIAL)**, pages 394-397, 2012.

24. Mohammad Alizadeh, **Adel Javanmard**, Shang-Tse Chuang, Sundar Iyer, and Yi Lu " *Versatile Refresh: Low-Complexity Refresh Scheduling for High-throughput Multi-banked eDRAM*", Proceeding of the 12th **ACM SIGMETRICS/PERFORMANCE**, pages 247-258, 2012.

25. Morteza Ibrahimi, **Adel Javanmard**, Yashodhan Kanoria, and Andrea Montanari,"*Robust Max-Product Belief Propagation,*" **Asilomar Conference** on Signals, Systems and Computers, pages 43-49, 2011.

26. **Adel Javanmard** and Andrea Montanari, "*Localization from Incomplete Noisy Distance Measurements,*" Proceeding of **IEEE International Symposium on Information Theory (ISIT)**, pages 1584-1588, 2011.
(**Best Student Paper Award Finalist**)

27. Mohammad Alizadeh, **Adel Javanmard**, and Balaji Prabhakar,"*Analysis of DCTCP: Stability, Convergence, and Fairness*", Proceeding of **ACM SIGMETRICS**, pages 73-84, 2011.

28. **Adel Javanmard**, Pedram Pad, Masoud Babaie-Zadeh and Christian Jutten, "*Estimating The Mixing Matrix In Underdetermined Sparse Component Analysis (SCA) Using Consecutive Independent component Analysis (ICA)*", Proceeding of the 16th European Signal Processing Conference **(EUSIPCO)**, Lausanne, Aug. 2008.

## In-Revision/Submitted

1. Alireza Mousavi, **Adel Javanmard**, Murat A. Erdogdu, "*Robust Feature Learning for Multi-Index Models in High Dimensions", preprint*, under review, 2024.

2. **Adel Javanmard**, Jingwei Ji, Renyuan Xu, "*Multi-Task Dynamic Pricing in Credit Market with Contextual Information*", under review, 2024.

3. Jennifer Brennan, Sébastien Lahaie, **Adel Javanmard**, Nick Doudchenko, Jean Pouget-Abadie, *"Causal Bootstrap for General Randomized Designs,"* under review, 2024.

4. Rudrajit Das, Inderjit S. Dhillon, Alessandro Epasto, **Adel Javanmard**, Jieming Mao, Vahab Mirrokni, Sujay Sanghavi, Peilin Zhong, *"Retraining with Predicted Hard Labels Provably Increases Model Accuracy,"* under review, 2024.

5. **Adel Javanmard**, Vahab Mirrokni, Jean Pouget-Abadie, *"Causal Inference with Differentially Private (Clustered) Outcomes,"* under review, 2023.

6. Dmitrii M. Ostrovskii, Mohamed Ndaoud, **Adel Javanmard** and Meisam Razaviyayn, "*Near-Optimal Model Discrimination with Non-Disclosure,*" major revision at **Operations Research**, 2021.

7. **Adel Javanmard**, Mohammad Meharbi, "*Pearson Chi-squared Conditional Randomization Test,*" major revision at **Journal of American Statistical Association (Theory and Methods)**, 2021.

8. Simeng Shao, **Adel Javanmard** and Jacob Bien, "*Prediction Sets for High-Dimensional Mixture of Experts Models,*" major revision at **Journal of Royal Statistical Society (Series B)**, 2022.

9. Amin Jalali, **Adel Javanmard** and Maryam Fazel, "*New Computational and Statistical Aspects of Regularized Regression with Application to Rare Feature Selection and Aggregation,*" under review 2019.

## Grant Proposals

1. *USC Gen AI Research Award (2024)*, co-PI: ($49,958). Title: "Making Generative AI Accessible: Efficient Training and Fine-Tuning with Resource-Aware Algorithms"

2. *USC Marshall Outlier Research in Business (iORB) grant (2024)*, solo-PI: ($12,000). Title: "Improving the Privacy-Variance Tradeoff of Causal Inference on Differentially Private Data".

3. *AWS AI Amazon Research Awards (2024)*, co-PI: ($70,000 cash funding, $50,000 AWS credits) Title: "Reliable AI for Generation of Medical Reports from MRI Scans".

4. *NSF Award*, solo-PI: ($275,000) National Science Foundation grant. Title: "Robust and scalable algorithms for learning hidden structures in sparse network data with the aid of side information", 2023-2026.

5. *Adobe Data Science Faculty Research Award (2022)*, PI: ($50,000). Title: "Statistical Joint Modeling for Integrated Marketing Flows: Personalized Promotions Optimized Over Journey and Lifespan".

6. *Sloan Research Fellowship in Mathematics (2021)*, solo-PI: $75,000.

7. *Adobe Data Science Faculty Research Award (2020)*, solo-PI: ($50,000). Title: "Learn Your Customer: Novel Statistical Methods for Segmenting Online Users and Their Behaviors".

8. *NSF CAREER Award*, solo-PI: ($402,189) National Science Foundation grant. Title: "Valid and Scalable Inference for High-dimensional Statistical Models." (2019–2024). [1 of 5 awarded in Statistics in 2019]

9. *USC Marshall Outlier Research in Business (iORB) grant (2018)*, solo-PI: ($10,000). Title: "Reliable Inference for Statistical Models".

10. *USC Zumberge Individual Faculty Award (2017)*, solo-PI: ($26,174). Title: "Inference on Sparse Network Data via Semidefinite Programming."

11. *Google Faculty Research Award (2016)*, PI: ($65,500). Title: "Statistical Learning Mechanisms for Online Ad Markets: Stability and Incentive Compatibility".

## Patents

- Adel Javanmard, Jean Pouget-Abadie, Vahab Mirrokni (Google LLC), "A differentially private mechanism for valid causal inference with non-private clusters", filed May 17, 2024.

## Software Packages

- `hat`: Hierarchical Aggregation Teting (with Simeng Shao and Jacob Bien). [link to package and documentation].
- `onlineDebisiang`: Statistical Inference with Online Debiasing (with Yash Deshpande and Mohammad Mehrabi). [link to package and documentation].
- `onlineFDR`: an R package to control the false discovery rate for growing data repositories (with David S Robertson, Jan Wildenhain and Natasha A Karp). [link to package and documentation].
- `GAP`: General probabilistic models of spatial genetic ancestry with applications to stratification correction in genome-wide association studies (with Anand Bhaskar, Thomas Courtade and David Tse). [link to package and documentation].
- `SDPclustering`: Graph clustering and community detection via Semidefinite Programming (with Andrea Montanari and Federico Ricci-Tersenghi). [link to package and documentation].
- `sslasso`: Confidence Intervals and Hypothesis Testing for High- Dimensional Regression (with Hamid Javadi, Andrea Montanari and Sven Schmit). [link to package and documentation].

## Teaching

Courses Taught at University of Southern California:

BUAD 310: **Applied Business Statistics**

- *introductory class for undergraduate business students*
- *Course description*: Statistical methods for business analysis; data exploration and description. Topics include: sampling distributions, estimation, hypothesis testing, simple and multiple regression, model building. Extensive computer applications.

BUAD 311: **Operations Management**

- *Core course for undergraduate business students*
- *Course description*: Fundamentals of operations management. Skills needed to analyze, manage, and improve business processes. Topics include: process, capacity, service, and inventory management and optimization.

DSO 604: **Modern Statistical Inference**

- *Core course for PhD students*
- *Course description*: A Special topic PhD level course to expose students to modern ideas in statistical inference with big data: bias, heterogeneity and fairness. Topics include: testing problems in high dimensions, multiple testing problems, conformal prediction, conditional randomization test, fairness via equitable coverage.

DSO 699: **Bandit Algorithms and Reinforcement Learning**

- *PhD-level course*
- *Course description*: The course explores the theoretical foundations and cutting-edge methods for sequential decision-making. Students will delve into the principles of exploration and exploitation through classical bandit algorithms and advance to strategic exploration techniques in reinforcement learning, addressing dynamic optimization in uncertain environments.

## Advisee/Mentees

I have been fortunate to advise/co-advise and work with the following PhD students/postdocs:

- Mohammad Mehrabi, PhD at Marshall School of Business, now Postdoctoral at Stanford.
- Simeng Shao, PhD at Marshall School of Business, now Applied researcher at Amazon
- Rashmi Ranjan Bhuyan, PhD student at Marshall School of Business
- Yuxuan (Troy) Tao, PhD student at USC mathematics
- Jingwei Ji, PhD student at USC Industrial System and Engineering
- Dmitrii Ostrovskii, Postdoc at USC Industrial System and Engineering, now Assistant professor at Georgia Tech (Math and ISyE)
- Hamid Javadi, Postdoc at Rice, Electrical Engineering, now at Google
- Yash Deshpande, postdoc at MIT, now at Voleon

## Presentations

**Theoretical Insights into Wide Neural Networks: Optimization, Generalization and Robustness**

73. Department of Statistics and Data Science, Wharton School, May 2024.

**Learning from Aggregate Responses**

72. Columbia University, Statistics department seminar, Nov 2024.
71. Bernoulli-IMS 11th World Congress in Probability and Statistics, Aug 2024.
70. Workshop on "Statistical Machine Learning for High Dimensional Data," National University of Singapore, May 2024.
69. EnCORE Workshop on Computational vs Statistical Gaps in Learning and Optimization, UCLA IPAM, Feb 2024.

**PriorBoost: An Adaptive Algorithm for Learning from Aggregate Responses**

68. 2024 Information Theory and ApplicationsWorkshop, Feb 2024.

**Anonymous Learning via Look-Alike Clustering**

67. Thirty-seventh Conference on Neural Information Processing Systems, Dec 2023.

**Adversarial robustness for latent models**

66. Institute for Advanced Study in Mathematics, Hangzhou, Dec 2023.

**Fundamental Tradeoffs in Adversarial Training**

65. Statistics seminar, University of California Riverside, Nov 2023

**Precise Statistical Analysis of Classification Accuracies for Adversarial Training**

64. Michigan State University, Sep 2023.
63. Annals of Statistics invited session, JSM 2023.

**Controlling the False Split Rate in Tree-Based Aggregation**

62. Machine Learning Across Disciplines: New Theoretical Developments, June 2022.

**The curse of overparamterization in adversarial training**

61. Information Theory and Applications (ITA) Workshop, Feb 2023.
60. New Advances in Statistics and Data Science, May 2022.

**Pearson Chi-squared Conditional Randomization Test**

59. USC Econometrics Seminar, November 2021.

**Mean field asymptotics in high-dimensional statistics**

58. 12th International Conference on Multiple Comparison Procedures (MCP), September 2021

**Statistical Inference for High-Dimensional Models**

57. IMS Tweedie Invited Lecture, Bernoulli-IMS One World Symposium, August 2020

**Precise Tradeoffs in Adversarial Training for Linear Regression**

56. Invited talk at Fuqua School of Business, Duke University, March 2021.
55. Invited talk at UIUC Statistics Seminar, March 2021.
54. Invited talk at Yale University, Department of Statistics and Data Science, Dec 2020.
53. Invited talk at CMU Statistics and Data Science Seminar, October 2020
52. Thirty-third Annual Conference on Learning Theory, July 2020

**Online Debiasing for Adaptively Collected High-dimensional Data**

51. Invited talk at Simons Institute for the Theory of Computing (*Reunion workshop of Foundations of Data Science Program*), December 2019

**Analysis of a two-layer neural networks via displacement convexity**

50. Invited talk at Institute for Outlier Research (iORB) mini-conference, USC Marshall, December 2019
49. Invited talk at INFORMS Annual Meeting, Seattle, Washington, October 2019
48. Invited talk at International Conference on Continuous Optimization (ICCOPT), Berlin, August 2019
47. Invited talk at American Mathematical Society (AMS) Meeting, Honolulu, Hawaii, March 2019
46. Invited talk at Wilks Seminar, Princeton University, March 2019
45. Invited talk at workshop of Rough Landscapes: From Physics to Algorithms, Kavli Institute for Theoretical Physics, January 2019

**A Flexible Framework for Hypothesis Testing in High-Dimensions**

44. Invited talk at Simons Institute for the Theory of Computing (*Foundations of Data Science Program*), November 2018
43. Invited talk at Information Theory and Applications Workshop (ITA), February 2018
42. Invited talk at Conference on Information Sciences and Systems (CISS), Princeton, March 2018

**Dynamic Incentive-Aware Learning: Robust Pricing in Contextual Auctions**

41. Invited talk at ISE seminar, University of Southern California, October 2020
40. Invited talk at IEOR/DRO seminar, Columbia University, October 2020
39. Invited talk at INFORMS Annual Meeting, Seattle, Washington, October 2019

38. Invited talk at Simons Institute for the Theory of Computing (*Foundations of Data Science Program*), September 2018
37. Invited talk at Google Research, New York, May 2018
36. Invited talk at MIT Stochastics and Statistics Seminar, May 2018

**Dynamic Pricing in High-dimensions**

35. Invited talk at Information Theory and Applications Workshop (ITA), February 2017
34. Invited talk at MIT Operation Research Seminar, March 2017
33. Invited talk at INFORMS Annual Meeting, Houston, TX, October 2017

**Online Control of False Discovery Rate**

32. Invited talk at the 10th International Conference on Multiple Comparison Procedures, June 2017
31. Invited talk at Probability and Statistics seminar, Math Department, University of Southern California, January 2017
30. Invited talk at INFORMS Annual Meeting, Nashville, TN, November 2016
29. Invited talk at Joint Statistical Meetings, Seattle, August 2015
28. Invited talk at Statistical Learning and Data Science Conference, University of North Carolina, Chapel Hill, June 2016

**Phase Transitions in Semidefinite Programming**

27. Invited talk at CommNetS Seminar, Electrical Engineering Department, University of Southern California, January 2016

**Extracting Biomedical Relationships from Unstructured Documents**

26. Invited talk at INFORMS Annual Meeting, Philadelphia, PA, November 2015

**De-biasing the Lasso: Optimal Sample Size for Gaussian Designs**

25. Invited talk at Symposium on Sparse Modeling and Its Applications, UCLA, Statistics department, October 2015

**Reasoning about Uncertainty in High-Dimensional Data Analysis**

24. Invited talk at AIM workshop on Inference in High-Dimensional Regression, Palo Alto, January 2015
23. Invited talk at UC Berkeley, November 2014
22. Invited talk at Massachusetts Institute of Technology (MIT), March 2014
21. Invited talk at University of California, Los Angeles (UCLA), March 2014
20. Invited talk at Princeton University, February 2014
19. Invited talk at University of California, San Diego (UCSD), February 2014
18. Invited talk at University of Washington, February 2014
17. Invited talk at Microsoft Research, NYC, February 2014
16. Invited talk at Wharton School of the University of Pennsylvania, February 2014
15. Invited talk at Yale University, February 2014
14. Invited talk at University of Southern California (USC), January 2014
13. Invited talk at Microsoft Research, Silicon Valley, January 2014

**Confidence Intervals and Hypothesis Testing for High-Dimensional Regression**

12. Invited talk at University of Illinois (UIUC), November 2013

**Reasoning about Uncertainty in Social Network Analysis**

11. Invited talk at INFORMS annual meeting, Minneapolis, MN, October 2013

**Nearly Optimal Sample Size in Hypothesis testing for High-Dimensional Regression**

10. Invited talk at Annual Allerton Conference on Communication, Control and Computing, October 2013

**Information-Theoretically Optimal Compressed Sensing**

9. Invited talk at University of Southern California (USC), January 2014
8. Invited talk at Information Theory Forum, Stanford, February 2013
7. Invited talk at Asilomar Conference on Signals, Systems, and Computers, November 2012
6. IEEE International Symposium on Information Theory (ISIT), Cambridge, MA, July 2012

**Subsampling at Information Theoretically Optimal Rates**

5. IEEE International Symposium on Information Theory (ISIT), Cambridge, MA, July 2012

**Minimax Risk of Truncated Series Estimators over Symmetric Convex Polytopes**

4. IEEE International Symposium on Information Theory (ISIT), Cambridge, MA, July 2012

**Localization from Incomplete Noisy Distance Measurements**

3. IEEE International Symposium on Information Theory (ISIT), August 2011
2. Invited talk at Microsoft Research, Silicon Valley, August 2011
1. Invited talk at the IDEAL group, Stanford, October 2011

## Selected Professional Activities & Service

- Service to Profession:
  - **Committee member:** INFORMS Dantzig Dissertation Prize (2022-present).
  - **Associate Editor:** Operations Research, Machine Learning and Data Science Section, 2020-2024.
  - Invited nominator for *The Shaw Prize*, 2022-2023.
  - **NSF panelist:** Proposal review panelist for DMS (2021), AMPS (2023).
  - **National Science Centre panelist:** (Poland) grant review panelist 2016, 2020
  - **Journal Review:** Referee for *Proceedings of the National Academy of Sciences, Annals of Statistics, Journal of the American Statistical Association, Journal of Royal Statistical Society, Biometrika, Electronic Journal of Statistics, JSTAT (Journal of Statistical Mechanics: Theory and Experiment), Journal of Econometrics, Bernoulli Journal, Statistics Surveys, Statistical Science, Journal of Machine Learning Research, Operations Research, Management Science, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE ACM Transactions on Sensor Networks.*
  - **Conference Review:** Referee for *Advances in Neural Information Processing Systems (NeurIPS 2013-2016,2019-2024), IEEE International Symposium on Information Theory (ISIT 2011-2021), International Conference on Machine Learning (ICML 2012,2017,2021,2023,2024), Conference on Learning Theory (COLT 2013, 2017, 2021), IEEE Information Theory Workshop (ITW 2012, 2017).*
  - **Program Committee,** IEEE International Symposium on Information Theory (ISIT), 2018, 2019.

- **Session Chair** for "Machine Learning and Privacy" at the Information Theory and Application (ITA), 2024.
- **Session Chair** for "sparsity" at the Information Theory and Application (ITA), 2017.
- **Session Chair** on "Network Modeling and Inference" at the INFORMS Annual Meeting, 2016.
- Invited speaker at accredited conferences and top universities (with more than 70 presentations in the past few years) including Wharton, Yale, CMU, Columbia university, MIT, UC Berkeley, etc.

• Service to School:

- Chair of PEG committee for the 4th-year review of professor Paromita Dubey (2024)
- Executive member of USC Marshall Institute for Outlier Research in Business (iORB) (2023-present)
- Committee member for DSO Statistics Faculty Hiring (2023-2024)
- Organizer of session *"Recent Trends in Generative AI"* at the USC Marshall SEEDS Conference, 2024
- Panelist for the DSO NSF CAREER Award and Grants Workshop (November 2023)
- DSO Annual Performance Review (APR) committee member (2022-2023)
- Committee member on Marshall Research & Faculty Recognition (Spring 2022)
- Marshall Grade Appeal committee member (2022-2023)
- Marshall BUAD311 course coordinator (Fall 2022)
- PEG committee member for tenure promotion of professor Gourab Mukherjee (2021)
- Mentor of Assistant Professor Matteo Sesia (2021-2023)
- Committee member for DSO Statistics PhD program admission (2015-present)
- DSO Statistic seminar organizer (2019-2021)
- Wrote and graded problems for Statistics PhD screening exam (2016-present)
- PhD advisor/co-advisor: Simeng Shao (2017-2022), Mohammad Mehrabi (2018-2023), Rashmi Ranjan Bhuyan (2022-present)
- Faculty speaker at DSO 621 Research Forum for Marshall PhD students (Sep 2016, Mar 2020, Sep 2023)
- Faculty speaker for DSO (Statistics) Prospective PhD Visit Day (February 2016, March 2018)
- Presenter at the Junior Faculty Research Day, USC Marshall School of Business (December 2019)

• Service to University:

- Courtesy appointment: Department of Computer Science, USC Viterbi School of Engineering (2017-present)
- Committee member for PhD students at USC:
  * Yuxuan(Troy) Tao (PhD student in Applied Math; Qualifying exam committee member)
  * Jingwei Ji (PhD Student at ISE Qualifying exam committee; PhD Dissertation committee)
  * Chien-Sheng Yang (ECE Viterbi; Qualifying exam committee, PhD Dissertation committee)
  * Mohammadreza Mousavi Kalan (ECE Viterbi; Qualifying exam committee, PhD Dissertation committee)
  * Liying Yang (USC Econ; Qualifying exam committee, PhD Dissertation committee)

– Proposed and taught two-day, welcome-week micro-seminar on *"Optimal use of data: How to come up with better predictions"* for incoming USC students (invited by the USC Office of Undergraduate Programs), 2020.

– Proposal review panelist for USC's Zumberge Individual Award, 2018.

*Last update: October 2024*