# Arash Ali Amini

UCLA Department of Statistics,
8125 Mathematical Sciences Building,
Los Angeles, CA 90095-1554


## Education

- Ph.D., Electrical Engineering and Computer Science, UC Berkeley, 2011.

  Designated Emphasis in Communication, Computation and Statistics.

- M.S. Electrical Engineering (Communication Systems), Sharif University, 2006.

- B.S. Electrical Engineering, Sharif University, 2004.

## Positions

- Assistant Professor, Department of Statistics, 2014–.

- Post-doctoral research fellow, Department of Statistics, University of Michigan, 2011–2014.

- Graduate Research Assistant and Graduate Teaching Assistant, EECS, UC Berkeley, 2007–2011.

- Communication Systems Engineer, KiaTel Research Center, 2004–2006.

- Internship, Iran Telecom. Research Center (ITRC), Summer 2003.

## Research Interests

High-dimensional Data Analysis, Nonparametric Estimation, Graphical models, Inference on Networks, Optimization, Convex Relaxation, Functional Data Analysis.

## Publications

*Published*


1. A. A. Amini and Z. S. Razaee. "Concentration of kernel matrices with application to kernel spectral clustering". *The Annals of Statistics* 49.1 (2021), pp. 531 –556.

2. Z. S. Razaee, A. A. Amini, M. A. Diniz, M. Tighiouart, G. Yothers, and A. Rogatko. "On the properties of the toxicity index and its statistical efficiency". *Statistics in Medicine* (2020).

3. P. Pandit, M. Sahraee-Ardakan, A. A. Amini, S. Rangan, and A. K. Fletcher. "Generalized Autoregressive Linear Models for Discrete High-Dimensional Data". *IEEE Journal on Selected Areas in Information Theory* 1.3 (2020), pp. 884–896.

4. Z. Razaee and A. Amini. "The Potts-Ising model for discrete multivariate data". *Advances in Neural Information Processing Systems* 33 (2020).

5. Z. Zhou and A. A. Amini. "Optimal bipartite network clustering". *Journal of Machine Learning Research* 21.40 (2020), pp. 1–68.

6. Q. Ye, A. A. Amini, and Q. Zhou. "Optimizing regularized Cholesky score for order-based learning of Bayesian networks". *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2020).

7. S. J. Kazemitabar and A. A. Amini. "Approximate Identification of the Optimal Epidemic Source in Complex Networks". *Proceedings of NetSci-X 2020: Sixth International Winter School and Conference on Network Science*. Ed. by N. Masuda, K.-I. Goh, T. Jia, J. Yamanoi, and H. Sayama. Cham: Springer International Publishing, 2020, pp. 107–125.

8. B. Aragam, A. Amini, and Q. Zhou. "Globally optimal score-based learning of directed acyclic graphs in high-dimensions". *Advances in Neural Information Processing Systems*. 2019, pp. 4452–4464.

9. Z. Zhou and A. A. Amini. "Analysis of spectral clustering algorithms for community detection: the general bipartite setting". *Journal of Machine Learning Research* 20.47 (2019), pp. 1–47.

10. Z. S. Razaee, A. A. Amini, and J. J. Li. "Matched Bipartite Block Model with Covariates." *Journal of Machine Learning Research* 20.34 (2019), pp. 1–44.

11. P. Pandit, M. Sahraee-Ardakan, A. Amini, S. Rangan, and A. K. Fletcher. "Sparse Multivariate Bernoulli Processes in High Dimensions". *Proceedings of Machine Learning Research*. Ed. by K. Chaudhuri and M. Sugiyama. Vol. 89. Proceedings of Machine Learning Research. PMLR, 2019, pp. 457–466.

12. A. A. Amini and E. Levina. "On semidefinite relaxations for the block model". *The Annals of Statistics* 46.1 (2018), pp. 149–179.

13. J. Kazemitabar, A. Amini, A. Bloniarz, and A. S. Talwalkar. "Variable Importance using Decision Trees". *Advances in Neural Information Processing Systems*. 2017, pp. 425–434.

14. A. A. Amini, E. Levina, and K. A. Shedden. "Structured regression models for high-dimensional spatial spectroscopy data". *Electron. J. Statist.* 11.2 (2017), pp. 4151–4178.

15. A. A. Amini, A. Chen, P. J. Bickel, and E. Levina. "Pseudo-likelihood methods for community detection in large sparse networks". *The Annals of Statistics* 41.4 (2013), pp. 2097–2122.

16. A. A. Amini and X. Nguyen. "Bayesian inference as iterated random functions with applications to sequential inference in graphical models". *Neural Information Processing Systems (NIPS)*. 2013.

17. A. A. Amini and X. Nguyen. "Sequential Detection of Multiple Change Points in Networks: A Graphical Model Approach". *IEEE Transactions on Information Theory* 59.9 (2013), pp. 5824–5841.

18. X. Nguyen, A. A. Amini, and R. Rajagopal. "Message-passing sequential detection of multiple change points in networks". *IEEE International Symposium on Information Theory (ISIT)*. 2012, pp. 2007–2011.

19. A. A. Amini and M. J. Wainwright. "Sampled forms of functional PCA in reproducing kernel Hilbert spaces". *The Annals of Statistics* 40.5 (2012), pp. 2483–2510.

20. A. A. Amini and M. J. Wainwright. "Approximation properties of certain operator-induced norms on Hilbert spaces". *Journal of Approximation Theory* 164.2 (2012), pp. 320–345.

21. A. A. Amini and M. J. Wainwright. "High-dimensional analysis of semidefinite relaxations for sparse principal components". *The Annals of Statistics* 37.5B (2009), pp. 2877–2921.

22. A. A. Amini and M. J. Wainwright. "High-dimensional analysis of semidefinite relaxations for sparse principal components". *IEEE International Symposium on Information Theory (ISIT)*. 2008, pp. 2454–2458.

23. A. A. Amini, M. Babaie-Zadeh, and C. Jutten. "A new approach for sparse decomposition and sparse source separation". *European Signal Processing Conference (EUSIPCO)*. 2006, pp. 2–6.

24. A. A. Amini, M. Babai-Zadeh, and C. Jutten. "A fast method for sparse component analysis based on iterative detection-projection". *Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt)*. 2006.

*Submitted (or on arxiv)*

25. Q. Ye, A. A. Amini, and Q. Zhou. "Distributed Learning of Generalized Linear Causal Networks". *Under Review* (2021).

26. L. Zhang and A. A. Amini. "Label consistency in overfitted generalized k-means". *Under Review* (2021).

27. L. Zhang and A. A. Amini. "Adjusted chi-square test for degree-corrected block models". *arXiv preprint arXiv:2012.15047* (2020).

28. A. A. Amini. "Spectrally-truncated kernel ridge regression and its free lunch" (June 14, 2019). arXiv: 1906.06276v1 [stat.ML].

29. M. S. Paez, A. A. Amini, and L. Lin. "Hierarchical Stochastic Block Model for Community Detection in Multiplex Networks" (Mar. 30, 2019). arXiv: 1904.05330v1 [cs.SI].

30. A. A. Amini, M. Paez, L. Lin, and Z. S. Razaee. "Exact slice sampler for Hierarchical Dirichlet Processes" (Mar. 21, 2019). arXiv: 1903.08829v1 [stat.ML].

31. H. Almohri, R. B. Chinnam, and A. A. Amini. "Performance Evaluation of Automotive Dealerships using Grouped Mixture of Regressions". *Submitted* (2019).

32. A. A. Amini, B. Aragam, and Q. Zhou. "The neighborhood lattice for encoding partial correlations in a Hilbert space" (Nov. 3, 2017). arXiv: 1711.00991v2 [math.ST].

33. B. Aragam, A. A. Amini, and Q. Zhou. "Learning Directed Acyclic Graphs with Penalized Neighbourhood Regression" (2017). arXiv: 1511.08963v3 [math.ST].

34. A. A. Amini, B. Aragam, and Q. Zhou. "On perfectness in Gaussian graphical models" (Sept. 3, 2019). arXiv: 1909.01978v1 [math.ST].

*In preparation*

35. S. J. Kazemitabar and A. A. Amini. "Efficient Network Epidemic Inference with Application to Source Identification". *Working paper* (2019-).

36. L. Shen, A. A. Amini, M. S. Paez, and L. Lin. "Bayesian community detection for networks with node covariates". *Working* (2020-).

*Unpublished*

- S. J. Kazemitabar, A. A. Amini, and A. Talwalkar. "On the support recovery of marginal regression" (Mar. 22, 2019). arXiv: 1903.09488v1 [math.ST].

- A. A. Amini. "Identifiability of Gaussian DAGs in the equal-variance case: A linear-algebraic proof". 2015.

## Teaching

*Main Instructor*

- Statistical Learning Theory, STATS 208, UCLA, Winter 2018.
- High-dimensional Statistics (STAT 200C), UCLA, Spring 2017, 2018, 2019, 2020.
- Linear models (STAT 100C), UCLA, Spring 2015, 2017, 2018, 2019, 2020.
- Theoretical Statistics (STAT 200B), UCLA, Winter 2015, 2016, 2017, 2018, 2019, 2020.
- Introduction to Theoretical Statistics (STAT 426), University of Michigan, Fall 2012.

*Teaching Assistant*

- Random Processes in Systems (EE 226A), UC Berkeley, Fall 2010.
- Probability and Random Processes (EE 126), UC Berkeley, Spring 2011.
- Digital Signal Processing, Sharif University, 2005.
- Adaptive Filters, Sharif University, 2005.

## Grants

*Awarded*

- PI on the NSF grant DMS-1945667 "CAREER: High-Dimensional Statistical Models for Unsupervised Learning". $400,000. Duration: 2020–2025.
- Co-PI with Qing Zhou on the NSF grant IIS-1546098 "BIGDATA: F: Learning Big Bayesian Networks", $919,305. Duration: 2015–2020.
- Co-PI with Chad Hazlett on UCLA Center for Social Sciences Seed Grant, "Improving Kernel Methods for Social Science Research", 2018.

## Service

- NSF review panels, 2017, 2018.
- Search committee, Dept. of Statistics, UCLA, 2018–2019 and 2019–2020.
- Admission committee, Dept. of Statistics, UCLA, 2014–2015 and 2019–2020.
- Organizing statistics seminars, Dept. of Statistics, UCLA, Academic year 2015–2017.
- Served on the following Ph.D. thesis committees:

| Student | Department | Committee Chair |
|---|---|---|

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|---|---|---|
| Linfan Zhang | STAT | Arash Amini |
| S. Jalil Kazemitabar | STAT | Arash Amini |
| Zhixin Zhou | STAT | Arash Amini |
| Bryon Aragam | STAT | Qing Zhou (co-advised) |
| Qiaoling Ye | STAT | Qing Zhou (co-advising) |
| Mojtaba Sahraee-Ardakan | EE | Allie Fletcher (co-advising) |
| Parthe Pandit | EE | Allie Fletcher (co-advising) |
| Denali Molitor | Mathematics | Deanna Needell |
| Qiujing Lu | EE | V. Roychowdhury |
| Xin Jiang | EE | L. Vandenberghe |
| Spencer Frei | STAT | Ying Nian Wu |
| Thomas Merkh | Math | Guido Montufar |
| Hanjian Li | STAT | Qing Zhou |
| Wenyu Zhou | STAT | Ying Nian Wu |
| Zhanhao Peng | STAT | Qing Zhou |
| Ruochen Jiang | STAT | Jingyi Li |
| Hao Wang | STAT | Qing Zhou |
| Neng Chieh Chang | Ecnonomics | D. N. Chetverikov |
| Qian Xiao | STAT | Hongquan Xu |
| Lin Wang | STAT | Hongquan Xu |
| Qian Xiao | STAT | Hongquan Xu |
| Aaron Danielson | STAT | Mark S. Handcock |
| Siavash Jalal | STAT | Peter Bentler |
| Ryan Rosario | STAT | Ying Nian Wu |
| Seunghyun Min | STAT | Qing Zhou |
| Yu Zhang | CE | Henry Burton |
| Clayton Schoeny | EE | Lara Dolecek |
| Pratik Chaudhari | CS | Stefano Soatto |
| Mehrdad Showkatbakhsh | EE | Suhas Diggavi |
| Huwenbo Shi | Bioinformatics | Janet Sinsheimer |
| Ehsan Ebrahimzadeh | EE | Vwani Roychowdhury |
| Onur Atan | EE | Mihaela van der Schaar |
| Mihir Laghate | EE | Danijela Cabric |

- Served on the following master's thesis committees: **Han Sun (chaired)**, **Ablaikhan Akhazhanov (co-chaired)**, Fan Zhang, Xiaolu Yu, Fiona Chehong Yeung, Jinchao Li, Dacheng Zhang, Xin Jiang, Xiaolu Yu, Ruiqi Zhong.

## Advising

- Linfan Zhang, Statistics, PhD, UCLA, 2018-.
- Qiaoling Ye, Statistics, PhD, UCLA. (co-advising), 2016-.
- Parthe Pandit, EE, PhD (co-advising), 2018-.
- Mojtaba Sahraee-Ardakan, EE, PhD, (co-advising), 2018-.
- Peichen Wu, Statistics, MS, 2019-.

## Alumni

- Seyed Jalil Kazemitar, Statistics PhD, UCLA, 2016-2020.
- Zhixin Zhou, Statistics PhD, UCLA, 2015-2018.
- Han Sun, Statistics MS, UCLA, 2016-2018.
- Hassan Sadeghi, MS, Finance, ETH, 2018-2019, (visiting).
- Haidar Almohri, IEOR PhD, Wayne State University, (co-advised), 2014-2017.
- Ehsan Ebrahimzadeh, EE PhD, UCLA. (co-mentored), 2014-2018.
- Priyanka Nanayakkara, undergraduate internship (Stats 195), 2017-2018.
- Minshuo Chen, EE MS (informal co-advising), 2015-2016.
- Fan Chen, CSST undergraduate internship, UCLA. Summer 2015.

## Invited talks and presentations

- Invited talk at JSM 2020, August 2020.
- Invited talk at University of Notre Dame, Department of Statistics, October 2019.
- Invited talk at UC Riverside, Department of Statistics, October 2018.
- Invited talk at "2017 IMS-China International Conference on Statistics and Probability", Nanning, China, June 2017.
- Invited talk at "Probability and Statistics seminar", Math Department, University of Southern California (USC), March 2016.
- Invited talk at "Ann Arbor Non-parametric Workshop", University of Michigan, Ann Arbor, MI, October 2016.
- Invited talk at "Graph Limits & Statistics Workshop", Isaac Newton Institute (INI), Cambridge, UK, July 2016.
- Invited talk at "Statistical Network and High-Dimensional Data Analysis Theory and Applications Workshop" in Fudan University, Shanghai, China, March 2016.
- Invited talk at "Santa Fe Network Workshop", Santa Fe Institute, December 2015.
- Invited talk at WNAR'15, session on networks, 2015.
- Invited talk at Department of Statistics, UT Austin, 2015.
- Invited talk at Department of Biostatistics, UCLA, 2015.
- Invited talk at Department of Statistics, UCLA, 2014.
- Poster presentation at NIPS'14, workshop on networks, 2014.
- Invited talk at Department of Statistics, Yale, 2014.
- Invited talk at Department of Statistics, Harvard, 2014.
- Invited talk at Department of Statistics, Ohio State Univ., 2014.
- Invited talk at Department of Statistics, Purdue, 2014.
- Invited talk at Department of Statistics, U. of Toronto, 2014.

- Invited talk at Department of Statistics, UC Davis, 2014.
- Invited talk at Department of Statistics, UCLA, 2014.
- Invited talk at Department of Statistics, UIUC, 2014.
- Invited talk at Department of Statistics, U. of Wisconsin-Madison, 2014.
- Spotlight presentation at NIPS'13, 2013.
- Invited talk at Department of Statistics, U. of Michigan, 2013.
- Invited talk at Department of Statistics, Yale, 2013.
- Invited talk at at JSM'13, session on statistics in chemistry and chemical biology, 2013.
- Invited talk at Department of Statistics, CMU, 2011.
- Paper presentation at ISIT'08, 2008.

## Refereeing

Annals of Statistics
Biometrika
Journal of American Statistical Association (JASA)
Proceedings of the National Academy of Sciences
Statistical Science
Electronic Journal of Statistics
Journal of Multivariate Analysis
Probability Theory and Related Fields
Applied and Computational Harmonic Analysis
Mathematical Reviews
Mathematics of Operations Research
Proceedings of National Academy of Sciences
IEEE Transactions on Information Theory
Bayesian Analysis
COLT
AISTATS
ICLR

## Honors

UC Berkeley-Vodafone fellowship, 2006-2007.

Ranked 2nd among EE graduates, Sharif Univ., 2004.

Among top 50 in nationwide university entrance exam, Iran, 2000.

## Computing Skills

Proficient in R, Python, MATLAB, LaTeX, and Linux.

Familiar with C, Julia, and HTML.

## Miscellaneous

U.S. citizen

## References (available upon request)

| | | |
|---|---|---|
| Peter J. Bickel | Professor of Statistics,<br>UC Berkeley | bickel@stat.berkeley.edu |
| Elizaveta Levina | Associate Professor of Statistics,<br>University of Michigan | elevina@umich.edu |
| XuanLong Nguyen | Assistant Professor of Statistics,<br>University of Michigan | xuanlong@umich.edu |
| Martin J. Wainwright | Professor of Statistics, and<br>Associate Professor of EECS,<br>UC Berkeley | wainwrig@stat.berkeley.edu |
| Mark Handcock | Professor of Statistics<br>UCLA | handcock@stat.ucla.edu |
| Qing Zhou | Professor of Statistics<br>UCLA | zhou@stat.ucla.edu |

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