

Ali Shojaie, Ph.D.

University of Washington
Department of Biostatistics
334 Hans Rosling Center
3980 15th Avenue NE, Box 351617
Seattle, WA 98195

Phone: (206) 616-5323
Email: ashojaie@uw.edu
Homepage: faculty.washington.edu/ashojaie/

Education

- Iran University of Science & Technology, Tehran, Iran, B.Sc in Industrial and Systems Engineering, 09/1993-02/1998
- Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran, M.Sc in Industrial Engineering, 09/1998-02/2001
- Michigan State University, East Lansing, MI, M.S. Statistics, 01/2003-05/2005
- University of Michigan, Ann Arbor, MI, M.S. in Human Genetics, 09/2006-12/2009
- University of Michigan, Ann Arbor, MI, M.S. in Applied Mathematics, 09/2007-04/2010
- University of Michigan, Ann Arbor, MI, PhD in Statistics, 09/2005- 04/2010

Professional Positions

- Postdoctoral Research Fellow, Dept. of Statistics, University of Michigan, 05/2010-06/2011
- Visiting Scholar, Statistical & Applied Mathematical Sciences Institute (SAMSI), 09/2010-05/2010
- Professor of Biostatistics and Adjunct Professor of Statistics, University of Washington, 07/2020-present
 - Associate Professor of Biostatistics and Adjunct Associate Professor of Statistics, University of Washington, 07/2016-06/2020
 - Assistant Professor of Biostatistics and Adjunct Assistant Professor of Statistics, University of Washington, 07/2011-06/2016
- Associate Chair for Strategic Research Affairs, Department of Biostatistics, University of Washington, 09/2020-present
- Founding Director, Summer Institute for Statistics in Big Data (SISBID), 05/2014-present
- Affiliate Member, Center for Statistics in Social Sciences (CSSS), University of Washington, 03/2012-present
- Affiliate Member, Biostatistics and Biomathematics Program, Fred Hutchinson Cancer Research Center (FHRC), 09/2012-present
- Affiliate Faculty, eSciences Institute, University of Washington, 03/2014-present
- Affiliate Member, Algorithmic Foundations of Data Science (ADSI) Institute, University of Washington, 2018-present

Honors, Awards, Scholarships

- NIH-NHGRI Genome Science Training Fellowship, Univ. of Michigan, 2005
- Outstanding First Year PhD Student, Department of Statistics, Univ. of Michigan, 2006
- NIH-NCI Training Program in Cancer Research Fellowship, Univ. of Michigan, 2007
- Distinguished Student Paper Award, International Biometrics Society, Eastern North American Region (ENAR), 2009
- Student Paper Competition Award, Statistical Computing and Graphics Sections, ASA, 2010
- International Society of Computational Biology (ISCB) Travel Fellowship, 2010
- Nominated for Rackham Distinguished Dissertation Award, Rackham School of Graduate Studies, University of Michigan (<6% of PhD recipients nominated)
- European Conference for Computational Biology (ECCB) Fellowship to attend 2010 ECCB
- Genentech Endowed Professorship, Department of Biostatistics, Univ. of Washington, 2011-2012
- David Byar Travel Award, Biometric Section of ASA, awarded to Dr. Shojaie's PhD students, Arend Voorman & Sen Zhao (2014, 2016)
- Best Student Paper Award from the ASA Business and Economics Section, awarded to the work of PhD student Alex Tank, 2017
- Best Student Paper Award from the ASA Biopharmaceutical Section, awarded to PhD student Arjun Sondhi, 2018
- Best Talk at the NIPS Time Series Workshop, awarded to PhD student Alex Tank, 2018
- Best Student Paper Award from the ASA Statistical Learning and Data Science section, awarded to the work of PhD student Xu (Steven) Wang, 2020

Professional Activities

- **Leadership**
 - Founding Director, Summer Institute for Statistics in Big Data (SISBID), Department of Biostatistics, University of Washington, 2014-present
 - Founding co-Chair, the IMS ad-hoc committee for Junior Researchers (j-IMS)
 - Member of the Inaugural *Leo Breiman Award* Committee, ASA Section on Statistical Learning and Data Science, 2015-2016
 - Educational and Advisory Committee for ENAR, 2018
 - Member of the ISI Young Statisticians Committee (ISI-YS), 2018-present
 - Program Chair, ASA Section in Statistical Learning and Data Science (SLDS), 2018-2019 (PC Chair Elect) and 2019-2020 (PC Chair)
 - Chair Elect, ASA Section in Statistical Learning and Data Science (SLDS), 2020-2021
- **Editorial Service**
 - Associate Editor for Journal of American Statistical Association (2014-2020)
 - Associate Editor for Journal of Iranian Statistical Society (2015-)
 - Associate Editor for Journal of Multivariate Analysis (2016-)

- Editor, Section on Machine Learning and Data Mining, New England Journal of Statistics in Data Science (2020-)

- **Grant Review**

- NSF-DMS Review Panel (2013)
- NIH-BCHI Review Panel (2016)
- NIH-GCAT Review Panel (2017)
- NSF-DMS Review Panel (2017)
- NSF-DMS Review Panel (2019)
- NIH-BCHI Review Panel (2020)
- NIH-ZRG1 Review Panel (2018 – 2020)

- **Conference Organization**

- Member of the Student Organizing Committee, 1st Michigan Student Symposium in Interdisciplinary Statistical Sciences (MSSISS), 2007
- Member of the Organizing Committee, Institute for Mathematical Statistics (IMS) Young Scientists Meeting, 2014
- Member of the Scientific Program Committee, World Statistics Congress (WSC), 2015
- Organizing Committee co-Chair, Fifth Seattle Symposium in Biostatistics, 2015
- Organizing Committee co-Chair, Institute for Mathematical Statistics (IMS) Meeting of New Researchers in Probability and Statistics, 2015
- Co-Organizer, IJCAI Workshop on Knowledge Discovery in Healthcare Data, 2016
- Scientific Committee Member, Metabolomics Society International Meeting, 2018
- Member of the Scientific Program Committee, Joint Statistical Meetings (JSM), 2019
- Member of the Scientific Program Committee, Statistical Learning and Data Science (SLDS) Conference, 2020
- Member of the Scientific Program Committee, Eastern North American Region of the Biometrics Society (ENAR) Conference, 2021

Bibliography

[* indicates joint first authorship]

[‡ indicates Shojaie's mentees]

(a) **Refereed Research Articles**

1. B. Emamizadeh and **A. Shojaie**. Multi-Facility Location Problem with Probabilistic Demand Weights: A Heuristic Approach. In *Proceedings of Northeast DSI Annual Meeting*, 2002
2. **A. Shojaie** and G. Michailidis. Analysis of gene sets based on the underlying regulatory network. *Journal of Computational Biology*, 16(3):407–426, 2009
 - * Highlighted by the journal as the *Editor's Pick*.
3. **A. Shojaie** and G. Michailidis. Network enrichment analysis in complex experiments. *Statistical Applications in Genetics and Molecular Biology*, 9(1), 2010
 - * Received the *Outstanding Student Paper Award* from ENAR 2010.

4. **A. Shojaie** and G. Michailidis. Penalized likelihood methods for estimation of sparse high-dimensional directed acyclic graphs. *Biometrika*, 97(3):519–538, 2010
5. **A. Shojaie** and G. Michailidis. Discovering graphical Granger causality using the truncating lasso penalty. *Bioinformatics*, 26(18):i517–i523, 2010
 - * Received the *Best Student Paper Award* from the ASA Section on Computational and Graphical Statistics at JSM 2010.
6. **A. Shojaie** and G. Michailidis. Penalized principal component regression on graphs for analysis of subnetworks. *Advances in Neural Information Processing Systems (NIPS)*, 23:2155–2163, 2010
7. N. Putluri, **A. Shojaie**, V. Vasu, S. Vareed, S. Nalluri, V. Putluri, G. Thangjam, K. Panzitt, C. Tallman, and C. Butler. Metabolomic profiling reveals potential markers and bioprocesses altered in bladder cancer progression. *Cancer Research*, 71(24):7376–7386, 2011
8. N. Putluri*, **A. Shojaie***, V. Vasu*, S. Nalluri, S. Vareed, V. Putluri, A. Vivekanandan-Giri, J. Byun, S. Pennathur, and T. Sana. Metabolomic profiling reveals a role for androgen in activating amino acid metabolism and methylation in prostate cancer cells. *PLoS One*, 6(7):e21417, 2011
9. **A. Shojaie**, S. Basu, and G. Michailidis. Adaptive thresholding for reconstructing regulatory networks from time-course gene expression data. *Statistics in Biosciences*, 4(1):66–83, 2012
10. D. Petrochilos, **A. Shojaie**, J. Gennari, and N. Abernethy. Using random walks to identify cancer-associated modules in expression data. *BioData Mining*, 6(1):17, 2013
11. J. W. Lampe, S. L. Navarro, M. A. Hullar, and **A. Shojaie**. Inter-individual differences in response to dietary intervention: integrating omics platforms towards personalised dietary recommendations. *Proceedings of the Nutrition Society*, 72(2):207–218, 2013
12. A. Zimmerman, T. McCormick, H. Lee, and **A. Shojaie**. Improving attribute prediction through Network-Augmented Attribute Prediction. In *Proceedings of the IEEE GlobalSIP Symposium on Emerging Challenges in Network Sensing, Inference, and Communication*. IEEE, 2013
13. **A. Shojaie**. Link Prediction using Penalized Multi-Mode Exponential Random Graph Models. In *Proceedings of the 13th KDD Workshop on Learning and Mining with Graphs*. ACM, 2013
14. **A. Shojaie***, A. Jauhiainen*, M. Kallitsis*, and G. Michailidis. Inferring Regulatory Networks by Combining Perturbation Screens and Steady State Gene Expression Profiles. *PLoS One*, 9(2):e82393, 2014
15. D. M. Witten, **A. Shojaie**, and F. Zhang. The cluster elastic net for high-dimensional regression with unknown variable grouping. *Technometrics*, 56(1):112–122, 2014
16. A. K. Kaushik, S. K. Vareed, S. Basu, V. Putluri, N. Putluri, K. Panzitt, C. A. Brennan, A. M. Chinnaiyan, I. A. Vergara, N. Erho, N. L. Weigel, N. Mitsiades, **A. Shojaie**, G. Palapattu, G. Michailidis, and A. Sreekumar. Metabolomic profiling identifies biochemical pathways associated with castration-resistant prostate cancer. *Journal of Proteome Research*, 13(2):1088–1100, 2014
17. A. Voorman[‡], **A. Shojaie**, and D. Witten. Graph estimation with joint additive models. *Biometrika*, 101(1):85–101, 2014
 - * Received a *David Byar Travel Award* from the ASA Biometric Section at JSM 2013.
18. N. Sedaghat[‡], T. Saegusa[‡], T. Randolph, and **A. Shojaie**. Comparative study of computational methods for reconstructing genetic networks of cancer-related pathways. *Cancer Informatics*, 13(Suppl 2):55–66, 2014
19. P. Chun, R. McPherson, L. Marney, S. Zangeneh, B. Parsons, **A. Shojaie**, R. Synovec, and S. Juul. Serial plasma metabolites following hypoxic-ischemic encephalopathy in a nonhuman primate model. *Developmental Neuroscience*, 37(2):161–171, 2015
20. S. Chen[‡], D. Witten, and **A. Shojaie**. Selection and estimation for mixed graphical models. *Biometrika*, 102(1):47–64, 2015

★ Recognized as a *Highly Cited Paper* by *Biometrika*.

21. S. Basu, **A. Shojaie**, and G. Michailidis. Network Granger causality with inherent grouping structure. *Journal of Machine Learning Research (JMLR)*, 16:417–453, 2015
22. K. M. Tan, D. Witten, and **A. Shojaie**. The cluster graphical lasso for improved estimation of gaussian graphical models. *Computational Statistics & Data Analysis*, 85:23–36, 2015
23. L. Lin[‡], M. Drton, and **A. Shojaie**. Estimation of high-dimensional graphical models using regularized score matching. *Electronic Journal of Statistics*, 10(1):806–854, 2016
24. S. Zhao[‡] and **A. Shojaie**. A significance test for graph-constrained estimation. *Biometrics*, 72(2):484–493, 2016

★ Received a *David Byar Travel Award* from the ASA Biometric Section at JSM 2015.
25. T. Saegusa[‡] and **A. Shojaie**. Joint estimation of precision matrices in heterogeneous populations. *Electronic Journal of Statistics*, 10(1):1341–1392, 2016
26. N. Sedaghat[‡], M. Fathy, M. H. Modarressi, and **A. Shojaie**. Identifying functional cancer-specific miRNA-mRNA interactions in testicular germ cell tumor. *Journal of Theoretical Biology*, 404(7):82–96, 2016
27. A. K. Kaushik*, **A. Shojaie***, K. Panzitt*, R. Sonavane, H. Venghatakrishnan, M. Manikkam, A. Zaslavsky, V. Putluri, V. T. Vasu, Y. Zhang, and others. Inhibition of the hexosamine biosynthetic pathway promotes castration-resistant prostate cancer. *Nature Communications*, 7, 2016
28. J. Ma, **A. Shojaie**, and G. Michailidis. Network-based pathway enrichment analysis with incomplete network information. *Bioinformatics*, 32(20):3165–3174, 2016
29. L. Wang, S. Chen[‡], and **A. Shojaie**. Invited discussion for “causal inference by using invariant prediction: identification and confidence intervals” by J. Peters et al. *Journal of Royal Statistical Society–Series B (JRSSB)*, 78(5):947–1012, 2016
30. S. Chen[‡], D. Witten, and **A. Shojaie**. Nearly assumptionless screening for the mutually-exciting multivariate hawkes process. *Electronic Journal of Statistics*, 11(1):1207–1234, 2017
31. T. H. McCormick, H. Lee, N. Cesare, **A. Shojaie**, and E. S. Spiro. Using twitter for demographic and social science research: Tools for data collection and processing. *Sociological methods & research*, 46(3):390–421, 2017
32. X. Wang, **A. Shojaie**, Y. Zhang, D. Shelley, P. D. Lampe, L. Levy, U. Peters, J. D. Potter, E. White, and J. W. Lampe. Exploratory plasma proteomic analysis in a randomized crossover trial of aspirin among healthy men and women. *PLoS One*, 12(5):e0178444, 2017
33. I. B. Stanaway, J. C. Wallace, **A. Shojaie**, W. C. Griffith, S. Hong, C. S. Wilder, F. H. Green, J. Tsai, M. Knight, T. Workman, and others. Human oral buccal microbiomes are associated with farmworker status and azinphos-methyl agricultural pesticide exposure. *Appl. Environ. Microbiol.*, 83(2):e02149–16, 2017
34. C. Seshadri, N. Sedaghat[‡], M. Campo, G. Peterson, R. D. Wells, G. S. Olson, D. R. Sherman, C. M. Stein, H. Mayanja-Kizza, **A. Shojaie**, W. H. Boom, and T. R. Hawn. Transcriptional networks are associated with resistance to mycobacterium tuberculosis infection. *PLoS One*, 12(4):e0175844, 2017
35. S. Chen[‡], **A. Shojaie**, and D. M. Witten. Network reconstruction from high-dimensional ordinary differential equations. *Journal of the American Statistical Association (JASA T&M)*, 112(520):1697–1707, 2017
36. F. L. Miles, S. L. Navarro, Y. Schwarz, H. Gu, D. Djukovic, T. W. Randolph, **A. Shojaie**, M. Kratz, M. A. Hullar, P. D. Lampe, and others. Plasma metabolite abundances are associated with urinary enterolactone excretion in healthy participants on controlled diets. *Food & function*, 8(9):3209–3218, 2017

37. B. N. Ginos, S. L. Navarro, Y. Schwarz, H. Gu, D. Wang, T. W. Randolph, **A. Shojaie**, M. A. Hullar, P. D. Lampe, M. Kratz, and others. Circulating bile acids in healthy adults respond differently to a dietary pattern characterized by whole grains, legumes and fruits and vegetables compared to a diet high in refined grains and added sugars: A randomized, controlled, crossover feeding study. *Metabolism*, 83:197–204, 2018
38. R. Mathur, D. Rotroff, J. Ma, **A. Shojaie**, and A. Motsinger-Reif. Gene set analysis methods: a systematic comparison. *BioData Mining*, 11(1):8, 2018
39. T. W. Randolph, S. Zhao[‡], W. Copeland, M. Hullar, and **A. Shojaie**. Kernel-penalized regression for analysis of microbiome data. *The Annals of Applied Statistics*, 12(1):540–566, 2018
40. A. Haris[‡], **A. Shojaie**, and N. Simon. Wavelet regression and additive models for irregularly spaced data. In *Advances in Neural Information Processing Systems*, pages 8973–8983, 2018
41. Y. Zhang, M. H. Linder, **A. Shojaie**, Z. Ouyang, R. Shen, K. A. Baggerly, V. Baladandayuthapani, and H. Zhao. Dissecting pathway disturbances using network topology and multi-platform genomics data. *Statistics in Biosciences*, 10(1):86–106, 2018
42. S. Yu[‡], M. Drton, and **A. Shojaie**. Graphical models for non-negative data using generalized score matching. In *International Conference on Artificial Intelligence and Statistics (AISTAT)*, pages 1781–1790, 2018
43. N. Sedaghat[‡], M. Fathy, M. H. Modarressi, and **A. Shojaie**. Combining supervised and unsupervised learning for improved miRNA target prediction. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 15(5):1594–1604, 2018
44. A. Haris[‡], **A. Shojaie**, and N. Simon. Nonparametric regression with adaptive truncation via a convex hierarchical penalty. *Biometrika*, 106(1):87–107, 2019
45. X. Wang, **A. Shojaie**, and J. Zou. Bayesian hidden Markov model in large-scale multiple testing with correlated hypotheses. *Computational Statistics and Data Analysis (CSDA)*, 136(1):123–136, 2019
46. A. Tank[‡], E. B. Fox, and **A. Shojaie**. Identifiability and estimation of structural vector autoregressive models for subsampled and mixed-frequency time series. *Biometrika*, 106(2):433–452, 2019
 - * An earlier version of this paper was published in the proceedings of SIGKDD Workshop on Causal Discovery, 2016.
47. S. Yu[‡], M. Drton, and **A. Shojaie**. Generalized score matching for nonnegative data. *Journal of Machine Learning Research (JMLR)*, 20(76):1–70, 2019
48. S. Navarro, A. Tarkhan[‡], **A. Shojaie**, T. Randolph, H. Gu, D. Djukovic, K. Osterbauer, M. Hullar, M. Kratz, M. Neuhaus, P. Lampe, D. Raftery, and J. Lampe. Plasma metabolomics profiles suggest beneficial effects of a whole grain dietary pattern compared to a diet high in refined grains and added sugars on inflammation and energy metabolism in healthy adults on controlled diets. *American Journal of Clinical Nutrition*, 110(4):984–992, 2019
49. A. Sondhi[‡] and **A. Shojaie**. The Reduced PC-Algorithm: Improved Causal Structure Learning in Large Random Networks. *Journal of Machine Learning Research (JMLR)*, 20:1–31, 2019
 - * An earlier version of this paper received the *Best Student Paper Award* from the ASA Biopharmaceutical Section at JSM 2018.
50. D. Whitney, **A. Shojaie**, and M. Carone. Models as (deliberate) approximations. *Statistical Science*, 34(4):591–598, 2019
51. J. Ma, **A. Shojaie**, and G. Michailidis. A comparative study of network-based pathway enrichment analysis methods. *BMC Bioinformatics*, 20(546), 2019
52. Y. Wang[‡], T. Randolph, **A. Shojaie**, and J. Ma. The generalized matrix decomposition biplot and its application to microbiome data. *mSystems*, 4(6), 2019
 - * Highlighted by the journal as the *Editor's Pick*.

53. N. Simon and **A. Shojaie**. Convergence rates of nonparametric penalized regression under misspecified smoothness. *Statistica Sinica*, to appear, 2020
54. **A. Shojaie**. Differential Network Analysis: A Statistical Perspective. *WIREs Computational Statistics*, to appear, 2020
55. K. Jin, K. Wilson, J. Beck, C. Nelson, G. Brownridge, B. Harrison, D. Djukovic, D. Raftery, R. Brem, S. Yu[‡], M. Drton, **A. Shojaie**, P. Kapahi, and D. Promislow. Genetic and metabolic architecture of variation in diet restoration-mediated lifespan extension in *Drosophila*. *PLoS Genetics*, 16:e1008835, 2020
 - * Highlighted with a *perspective article* in *PLoS Genetics*.
56. A. Safikhani[‡] and **A. Shojaie**. Joint structural break detection and parameter estimation in high-dimensional non-stationary VAR models. *Journal of American Statistical Association (JASA T&M)*, to appear ; *arXiv preprint arXiv:1711.07357*, 2020
57. H. Manzour[‡], S. Küçükyavuz, H.-H. Wu, and **A. Shojaie**. Integer programming for learning directed acyclic graphs from continuous data. *INFORMS Journal on Optimization*, to appear; *arXiv preprint arXiv:1904.10574*, 2020
58. L. Lin[‡], M. Drton, and **A. Shojaie**. Statistical significance in high-dimensional linear mixed models. In *ACM-IMS Foundations of Data Science (FODS)*, 2020
59. A. Tank^{‡*}, X. Li^{‡*}, E. Fox, and **A. Shojaie**. The Convex Mixture Distribution: Granger Causality for Categorical Time Series. *SIAM Journal on Mathematics of Data Science (SIMODS)*; to appear; *arXiv preprint arXiv:1706.02781*, 2020
 - * Earlier versions of this paper were presented in *2nd SIGKDD Workshop on Mining and Learning for Time Series* and also received the *Best Student Paper Award* from the ASA Business and Economics Section at JSM 2018.
60. X. Li[‡] and **A. Shojaie**. Invited discussion of “A Tuning-Free Robust and Efficient Approach to High-Dimensional Regression” by Wang et al. *Journal of the American Statistical Association (JASA)*, 2020
61. S. Zhao[‡], D. Witten, and **A. Shojaie**. In Defense of the Indefensible: A Very Naive Approach to High-Dimensional Inference. *Statistical Science*; accepted, 2020
62. S. Dibay-Moghadam[‡], S. L. Navarro, **A. Shojaie**, T. W. Randolph, L. F. Bettcher, C. B. Le, M. A. Hullar, M. Kratz, M. L. Neuhausser, P. D. Lampe, D. Raftery, and J. W. Lampe. Plasma lipidomic profiles after a low and high glycemic load dietary pattern in a randomized controlled crossover feeding study. *Metabolism*, to appear, 2020
63. S. Yu[‡], M. Drton, and **A. Shojaie**. Generalized score matching for general domains. *Information and Inference*; to appear; *arXiv preprint arXiv:2009.11428*, 2020
64. A. Tank[‡], I. Covert, N. Foti, **A. Shojaie**, and E. Fox. Neural Granger Causality. *IEEE Transactions on Pattern Analysis and Machine Intelligence*; accepted subject to minor revision; *arXiv:1802.05842*, 2020

(b) Other Refereed Scholarly Publications

65. **A. Shojaie** and P.-N. Tan. Outlier Detection Based on Projection Based Ordering. In *Proceedings of 6th International Conference in Data Mining, Text Mining and Business Applications*, 2005
66. S. Basu, **A. Shojaie**, and M. G. Estimating regulatory networks from time course gene expression data via adaptive penalization. *Proceedings of 26th NIPS Workshop on Machine Learning in Computational Biology*, 2011
67. **A. Shojaie** and N. Sedaghat[‡]. How different are estimated genetic networks of cancer subtypes? In *Big and Complex Data Analysis*, pages 159–192. Springer, 2017

68. N. Sedaghat^{‡*}, I. Stanway^{*}, S. Zangeneh, T. Bammler, and **A. Shojaie**. Bioinformatics in toxicology: Statistical methods for supervised learning with high-dimensional omics data. In *Comprehensive Toxicology III*, pages 447–473. Elsevier, 2018
69. J. Ma, K. Yue[‡], and **A. Shojaie**. Networks for compositional data. In *Statistical Analysis of Microbiome Data*, to appear. Springer, 2020

Patents and Other Intellectual Property

Publicly Available Software

1. netgsa: R package for Network Enrichment Analysis
2. ngc: R package for inferring Network Granger Causality from high-dimensional longitudinal time series data
3. spacejam: R package for flexible estimation of graphical models with joint additive models
4. lassoscore: R package for inference in high dimensional penalized regression and M-estimation
5. Grace: R package for inference for graph-constrained and kernel penalized regression in high dimensions
6. HierBasis: R package for estimating flexible nonparametric additive functions
7. genscore: R package for estimation of high-dimensional graphical models using regularized score matching
8. CorDiffViz: R package for estimation and visualization of differential correlation networks

Funding History

a) Current Funding (as PI/co-PI)

1. Statistical Methods for Network-Based Integrative Analysis of CVD Epigenetic Data; *NIH-K01*, 2015-2020, **role: PI**
2. Machine Learning Tools for Discovery and Analysis of Active Metabolic Pathways; *NIH-R01*, 2016-2021, **role: PI**
3. Statistical Methods for Differential Network Biology with Applications to Aging; *NSF-DMS*, 2016-2020, **role: contact PI** (MPI, joint with M Drton, D Promislow, UW)
4. Statistical Methods for Discrete-Valued High-Dimensional Time Series with Applications to Neuroscience; *NSF-DMS* (CDS&E-MSS Program), 2017-2020, **role: PI**
5. Systems Biology Analysis of Cardiac Electrical Activity and Arrhythmias; *NIH-R01*, 2019-2022, **role: PI** (MPI, joint with N Sotoodehnia, UW & D Arking, JHU)
6. A Unifying Framework for High-Dimensional Additive Modeling; *NSF-DMS*, 2019-2022, **role: co-PI** (PI: N Simon)
7. Novel Statistical Inference for Biomedical Big Data; ; *NIH-R01*, 2020-2024, **role: PI**

b) Current Funding (as investigator)

1. A systems biology approach in *Drosophila* to identify novel factors that influence AD pathogenicity; *NIH-R01*, 2018-2022, **role: co-I** (PI: Promislow)
2. Integrated Multi-omics of Melioidosis, *NIH-R01*, 2018-2022, **role: co-I** (PI: Gharib)
3. Plasma proteomics in CHS and population biology, *NIH-R01*, 2019-2023, **role: co-I** (PI: Psaty)

c) Completed Projects

1. Collaborative Research: Statistical Methodology for Network based Integrative Analysis of Omics Data, *DMS/NIGMS*, 2012-2016; **role: PI of UW project** (lead PI: Michailidis)
2. Bridging Social Media and Public Health: Using Twitter to Explore Social Determinants of Obesity, *UW-SPH Emerging Strategic Challenges Grant* 2012-2013; **role: PI**
3. Using Social Media Networks to Identify Deviant Behavior, *Army Research Office*, 2012-2015; **role: PI** (MPI, joint with T McCormick, H Lee, Washington U)
4. 17th IMS New Researchers Conference, *NSF*; **role: PI**
5. 17th IMS New Researchers Conference, *NSA*; **role: PI**
6. 17th IMS New Researchers Conference, *NIH*; **role: PI** (MPI, joint with N Simon, UW)
7. Reconstructing Gene Regulatory Networks through Integration of Perturbation Screen and Steady State Expression Data Profiles, *NIH-R21*, 2013-2015; **role: co-PI** (PI: Michailidis)
8. Summer Institute for Statistics of Big Data, *NIH-R25*, 2014-2017; **role: contact PI** (MPI, joint with D Witten, UW)
9. Human and bacterial molecular pathways in cancer risk: modulation by diet; *NIH-R01*, 2016-2019, **role: co-I** (PI: Lampe)

Conferences and Symposia

a) Invited Seminars

1. Department of Statistics, University of Michigan, Jan 2010
2. Department of Biostatistics, University of Texas, Jan 2010
3. Department of Biostatistics, University of Washington, Feb 2010
4. Department of Statistics, University of Washington, Oct 2011
5. Fred Hutchinson Cancer Research Center, Oct 2011
6. Institute for Research in Fundamental Sciences (IPM), Iran, Dec 2011
7. Department of Mathematical Sciences, Sharif University of Technology, Dec 2011
8. Machine Learning Seminar, Carnegie Mellon University, Jan 2012
9. Computational Biology and Bioinformatics Department, Duke University, Feb 2012 (*student invited seminar*)
10. Department of Statistics and Actuarial Sciences, University of Waterloo, Sep 2012
11. Department of Statistics, Stanford University, Nov 2012
12. Department of Biostatistics, Univ. of Washington, Feb 2013
13. Department of Statistics, University of Pennsylvania, Oct 2013
14. Department of Statistics, West Virginia University, Oct 2013
15. Department of Statistics, Purdue University, Nov 2013
16. Department of Biomedical Informatics, University of Washington, Dec 2013
17. Department of Statistics, University of Wisconsin-Madison, Jan 2014
18. Department of Statistics, North Carolina State University, Jan 2014
19. Department of Statistics, Purdue University, Feb 2014
20. Department of Genome Sciences, University of Washington, Mar 2014

21. Computational Biology Program, Fred Hutchinson Cancer Research Center, Aug 2014
22. Division of Biostatistics, UC Berkeley, Oct 2014
23. Department of Mathematical Sciences, Sharif Univ. of Technology, Tehran, Iran, Dec 2014
24. Department of Statistics, University of Chicago, Jan 2015
25. Department of Biostatistics, Indiana University, Jan 2015
26. Division of Biostatistics, University of Minnesota, Feb 2015
27. PHeNOM Seminar Series, University of Washington, Feb 2015
28. Department of Biostatistics, University of North Carolina, Chapel Hill, Sep 2015
29. Department of Statistics, University of California at Los Angeles (UCLA), Oct 2015
30. Department of Biomedical Informatics, University of California at San Diego (UCSD), Feb 2016
31. Yahoo Machine Learning Seminar, University of Washington, Apr 2016
32. Biomathematics & Biostatistics Seminar, Fred Hutchinson Cancer Research Center, Apr 2016
33. Data Science Seminar, Fred Hutchinson Cancer Research Center, Jul 2016
34. Division of Biostatistics, Ohio State University, Oct 2016
35. Department of Biostatistics, Vanderbilt University, Nov 2016
36. Department of Statistics, Monash University, Australia, Feb 2017
37. Institute For Molecular Bioscience, University of Queensland, Feb 2017
38. NIH BD2K Program Webinar, Feb 2017
39. Department of Biostatistics, University of Pittsburgh, Apr 2017
40. UW-ML Seminar, University of Washington, May 2017
41. Department of Statistics, Rice University, Jan 2018
42. Centre for Quantitative Medicine Duke-NUS Medical School, Singapore, Feb 2018
43. Department of Statistics and Industrial Engineering, Georgia Tech University, Mar 2018
44. Department of Biostatistics, Columbia University, Apr 2018
45. Bank of New York (BNY) Mellon, Apr 2018
46. Econometrics and Statistics Colloquium, University of Chicago Booth School of Business, Oct 2018
47. Department of Statistics, North Carolina State University, Nov 2018
48. Department of Genome Sciences COMBI Seminar, University of Washington, Feb 2019
49. Department of Biostatistics, University of Washington, Mar 2019
50. Department of Biostatistics, University of Michigan, Sep 2019
51. Department of Statistics & Probability, Michigan State University, Oct 2019
52. Department of Mathematics & Statistics, McGill University, Oct 2019
53. Computational Neuroscience Program, University of Washington, Jan 2020
54. Department of Mathematical Sciences, University of Nevada, Las Vegas, Feb 2020
55. Department of Biostatistics, University of Washington (Visit Day Seminar), Feb 2020
56. Department of Statistics, Oregon State University, Nov 2020

b) Invited Talks in Conferences

1. Interdisciplinary Workshop on Statistical Topics, Univ. of Michigan, March 2009
2. First IMS-Asia-Pacific Rim Meeting, Seoul, South Korea, July 2009

3. Michigan Student Symposium in Interdisciplinary Statistical Sciences (MSSISS), April 2010
4. Inter-Group Seminar (IGS), University of Michigan, Oct 2010
5. Complex Network Transition Workshop, SAMSI, June 2011
6. Machine Learning Seminar, University of Washington, Oct 2011
7. Eastern North American Region of the International Biometrics Society (ENAR), March 2012
8. Perspectives on High-dimensional Data Analysis, CRM, Universite de Montreal, May 2012
9. Fields Institute Symposium Frontiers in Network Science (Guelph University), July 2012
10. Statistical Society of Canada (SSC) 2012, July 2012
11. International Chinese Statistical Association (ICSA) Meeting, July 2012
12. Joint Statistical Meetings (JSM), August 2012
13. Northwest Metabolomics Research Center Symposium, University of Washington, Sep 2012
14. INFORMS, Oct 2012
15. Perspectives on High-dimensional Data Analysis-III, University of British Columbia, Aug 2013
16. 59th World Statistics Congress, Sep 2013
17. Eastern North American Region of the International Biometrics Society (ENAR), Mar 2014
18. Conference of the ASA Section on Statistical Learning and Data Mining, Jun 2014
19. 2014 ICSA and KISS Joint Applied Statistics Symposium, Jun 2014
20. Conference of the International Society of Non-Parametric Statistics, Jun 2014
21. International Indian Statistical Association, July 2014
22. Perspectives on High-Dimensional Data Analysis-IV, BANF, Aug 2014
23. INFORMS Annual Meeting, Oct 2014
24. ERCIM Computational & Methodological Statistics (CMStatistics), Italy, Dec 2014
25. Fred Hutchinson Cancer Research Center, From Data Science to Data Sense, May 2015
26. World Statistics Congress (WSC), July 2015
27. Joint Statistical Meetings (JSM), Aug 2015
28. Perspectives on High-dimensional Data Analysis-V, Victoria BC, Aug 2015
29. iBRIGHT: Integrative Biostatistics Research for Imaging, Genomics, & High-throughput Technologies in Precision Medicine, Houston, TX, Oct 2015
30. Eastern North American Region of the International Biometrics Society (ENAR), March 2016
31. Perspectives on High-dimensional Data Analysis-VI, Fields Institute, May 2016
32. ASA Statistical Learning and Data Science Conference, UNC Chapel Hill, May 2016
33. Fourth IMS Asia-Pacific Rim Meeting (APRM), Hong Kong, June 2016
34. Joint Statistical Meetings (JSM), Aug 2016
35. 2016 International Indian Statistical Association Conference, Aug 2016
36. Ann Arbor Nonparametric Statistics Workshop, University of Michigan, Oct 2016
37. INFORMS Annual Meeting, Nov 2016
38. ERCIM Computational & Methodological Statistics (CMStatistics), Italy, Dec 2016
39. 10th ICSA Conference, Shanghai, China, Dec 2016
40. Eastern North American Region of the International Biometrics Society (ENAR), March 2017

41. SIAM Annual Meeting, July 2017
42. World Statistics Congress (WSC), July 2017
43. Joint Statistical Meetings (JSM), Aug 2017
44. IMS workshop on High Dimensional Data and Complex Networks, Feb 2018
45. Institute for Mathematics and its Applications (IMA) workshop on Frontiers in Forecasting, Feb 2018
46. Eastern North American Region of the International Biometrics Society (ENAR), March 2018
47. Workshop on Discovery of Causal Structure in High Dimensions, Centre de Recherches Mathématiques (CRM), May 2018
48. Statistical Learning and Data Science (SLDS) Conference, June 2018
49. 14th Iranian Statistics Conference, Aug 2018
50. 47th Annual Iranian Mathematics Conference, Aug 2018
51. Workshop on Point Process Models, Texas A&M University, Sep 2018
52. Workshop on Network Data Analysis, Northeast Normal University, China, Oct 2018
53. Peter Hall Conference, University of California-Davis, May 2019
54. Statistics & Data Science Symposium (SDSS), Bellevue WA, May 2019
55. Machine Learning & Data Science Workshop, Department of Statistics, Columbia Univ., June 2019
56. WNAR, Portland, OR, June 2019
57. ICSA Conference, Tianjin, China, July 2019
58. MIFODS Symposium on Graphical Models, MIT, Aug 2019
59. Michigan Statistics 50th Anniversary, Ann Arbor, MI, Sep 2019
60. UW Computational Molecular Biology (CMB) Program, Oct 2019
61. Statistics and the Life Sciences: Creating a Healthier World (Boston Univ.), Nov 2019
62. ICSA Conference, Hangzhou, China, Dec 2019
63. ENAR, Mar 2020
64. Joint Statistical Meetings (JSM), Aug 2020
65. Iranian Statistics Conference (ISC), Sep 2020 (*special/general invited session*)
66. Tenth International Conference on High-Dimensional Data Analysis, Oct 2020
67. ACM-IMS Foundations of Data Science (FODS) Conference, Oct 2020
68. INFORMS Annual Meeting, Nov 2020
69. ERCIM Computational & Methodological Statistics (CMStatistics), Dec 2020

Teaching History

a) Formal Courses, including Distance Learning

- *Discrete Mathematics* (CSE 260), Department of Computer Science and Engineering, Michigan State University (Summer 2003, 2005)
- *Statistical Methods* (STT 200) (two sessions), Department of Statistics and Probability, Michigan State University (Spring 2008)
- *Statistical Methods in Business* (STT 315), Department of Statistics and Probability, Michigan State University (Spring 2009)

- *Computing Extras for Biostatistics* (BIOST 561), Department of Biostatistics, University of Washington (Autumn 2011, Autumn 2012)
- *Computing Extras for Biostatistics* (BIOST 562), Department of Biostatistics, University of Washington (Winter 2012, Winter 2013)
- *Tools for Biostatistics Research* (BIOST 563), Department of Biostatistics, University of Washington (Summer 2012 (co-taught with Ken Rice), Summer 2015, Summer 2016)
- *Special Topics in Advanced Biostatistics* (BIOST 578), Department of Biostatistics, University of Washington (Spring 2014, Spring 2015)
- *Machine Learning for Biomedical Big Data* (BIOST 546), Department of Biostatistics, University of Washington (Spring 2016, Spring 2017)
- *Lectures in Applied Statistics* (BIOST/STAT 111), Department of Biostatistics, University of Washington (Spring 2015, Spring 2016)
- *Nonparametric Regression* (BIOST/STAT 527), Department of Biostatistics, Univ. of Washington (Spring 2018)
- *Biostatistics Consulting* (BIOST 592), Department of Biostatistics, University of Washington (Spring 2019)
- *Advanced Regression Methods: Project* (BIOST 572), Department of Biostatistics, University of Washington (Spring 2020)
- *Introduction to Biomedical Data Science* (BIOST 544), Department of Biostatistics, University of Washington (Fall 2020)

b) Other Teaching: Short Courses and Workshops

- *Introduction to SAS*, Financial Engineering Summer Program, University of Michigan, (Summer 2010, 2011)
- Summer School in Statistical Genetics (SISG) module on *High-Dimensional Omics Data* (co-taught with Daniela Witten, 2012-2014)
- Summer School in Statistical Genetics (SISG) module on *Network and Pathway Analysis of Omics Data* (co-taught with Alison Motsinger-Reif, 2013-present)
- Joint Statistical Meeting (JSM) short course on *Statistical Methods for Unsupervised Learning* (2015, 2016)
- Summer School in Statistics of Big Data (SISBID) module on *Statistical Methods for Supervised Learning* (co-taught with Noah Simon, 2016-present)
- Brisbane Summer Institute in Statistical Genetics module on *Network and Pathway Analysis of Omics Data* (co-taught with Mike Inouye, 2016)
- Joint Statistical Meeting (JSM) short course on *Statistical Analysis of Biological Networks* (2019)
- *Introduction to Statistical Learning*, Seattle Symposium in Biostatistics (2015, 2020)
- ENAR short course on *Statistical Analysis of Biological Networks* (2020)

Advising and Formal Mentoring

a) PhD Dissertations, Chair

1. Arend Voorman, Biostatistics PhD, University of Washington, 2011-2014 (co-chair: D Witten)
2. Shizhe Chen, Biostatistics PhD, University of Washington, 2013-2016 (co-chair: D Witten)

3. Sen Zhao, Biostatistics PhD, University of Washington, 2014-2017
4. Lina Lin, Statistics PhD, University of Washington, 2015-2017 (co-chair: M Drton)
5. Asad Haris, Biostatistics PhD, University of Washington, 2015-2018
6. Arjun Sondhi, Biostatistics PhD, University of Washington, 2016-2019
7. Hasan Manzour, ISE PhD, University of Washington, 2018-2019 (co-chair: S Küçükyavuz)
8. Shiqing Yu, Statistics PhD, University of Washington, 2017-2020 (co-chair: M Drton)
9. Wenyu Chen, Statistics PhD, University of Washington, 2018-present (co-chair: M Drton)
10. Aaron Hudson, Biostatistics PhD, University of Washington, 2018-present
11. Xu (Steven) Wang, Biostatistics PhD, University of Washington, 2019-present
12. Kun Yue, Biostatistics PhD, University of Washington, 2019-present
13. Xiudi Li, Biostatistics PhD, University of Washington, 2019-present (co-chair: A Luedtke)

b) Masters Theses, Chair

1. Kevin Rubenstein, University of Washington, 2012-2014 (co-chair: K Rice)
2. Afshin Mashadi-Hosseini, University of Washington, 2013-2015

c) Mentored Scientists and Postdoctoral Fellows

1. Takumi Seagusa, Postdoctoral Fellow, 2012-2014. Current Position: Assistant Professor of Statistics, University of Maryland, College Park
2. Nafiseh Sedaghat, Visiting Student, 2015-2016. Current Position: PhD Student in Bioinformatics, Simon Fraser University
3. Abolfazl Safikhani, Visiting Scholar, 2017. Current Position: Assistant Professor of Statistics, University of Florida
4. Steve Mooney, UW Epidemiology (member of K99/R00 scientific advisory committee), 2018-2020
5. Yue Wang, Postdoctoral Fellow (joint with J Ma, FHCRC), 2018-2020. Current Position: Assistant Professor of Statistics, Arizona State University
6. Sepideh Dibai, Postdoctoral Fellow (joint with J Lampe, FHCRC), 2018-present
7. Hesam Jahanian, UW Radiology (K01 co-mentor), 2020-present
8. Shubhadeep Chakraborty, Postdoctoral Fellow, 2020-present
9. Lu Xia, Postdoctoral Fellow (joint with S Gharib, UW), 2020-present