Curriculum Vitae

Martin J. Wainwright

Education

Ph.D. in Electrical Engineering and Computer Science, 1999–2002
    Massachusetts Institute of Technology, Cambridge, MA.
    Thesis: *Stochastic Processes on Graphs with Cycles: Geometric and Variational Approaches*
    Advisors: Prof. Alan Willsky and Prof. Tommi Jaakkola

M.S. in Vision Science, 1996–1998
    Harvard University, Cambridge, MA, USA
    Thesis: *Visual adaptation as optimal information transmission*
    Advisor: Prof. Patrick Cavanagh

B.Math. Pure and Applied Mathematics, 1990–1994
    University of Waterloo, Canada.

Academic Employment

Cecil H. Green Chair, EECS and Mathematics, Massachusetts Institute of Technology, July 2022—

Howard Friesen Chair, EECS and Statistics, UC Berkeley, July 2021—July 2022

Chancellor's Professor, EECS and Statistics, UC Berkeley, July 2018–July 2021.

Nachdiplom Visiting Lecturer, Department of Mathematics, ETH Zurich, July 2015–December 2015.

Full Professor, EECS and Statistics, UC Berkeley, July 2011—July 2022.

Visiting Professor, Massachusetts Institute of Technology, Department of EECS, January — June 2011.

Associate Professor, EECS and Statistics, UC Berkeley, July 2009 — July 2011.

Assistant Professor, EECS and Statistics, UC Berkeley, July 2004—June 2009.

Postdoctoral Associate, UC Berkeley, August 2002 – July 2004.

Research Interests

High-dimensional statistics

Reinforcement learning and stochastic control

Machine learning: theory and algorithms

Sampling algorithms and Markov chain Monte Carlo

Causal estimation and inference

Distributed algorithms and optimization

Selected awards

David Blackwell Award and Lectureship, Institute of Mathematical Statistics, 2017

Distinguished Lecturer, IEEE Information Theory Society, 2015–2016

COPPS Presidents' Award (2014) from the Presidents of Statistical Societies: `https://en.wikipedia.org/wiki/COPSS_Presidents_Award`

Fellow, Institute of Mathematical Statistics (2014)

Invited Section Lecturer, Probability and Statistics, International Congress of Mathematicians, Seoul, Korea (2014)

Medallion Award and Lectureship, Institute of Mathematical Statistics, JSM, Montreal, Canada (2013)

Joint IEEE Communications and Information Theory Best Paper Award (2012)

IEEE Communications Society Best Paper Award (2010)

IEEE Signal Processing Society Best Paper Award (2008)

National Science Foundation CAREER Award (2006)

Alfred P. Sloan Foundation Fellowship (2005)

Okawa Foundation Research Fellowship (2005)

George M. Sprowls Award for Best Ph.D. Thesis in Computer Science (2002), Massachusetts Institute of Technology, Department of EECS,

Professional Activities

Institute of Mathematical Statistics, Elected Council Member, 2020—present

International Congress of Mathematicians, Panel Member, 2020

Associate editor and editorial boards:

- SIAM Journal on Mathematics oif Data Science, Editorial Board, 2023—present
- Journal of Machine Learning Research, Editorial Board, 2013—present.
- Journal of the American Statistical Association, Associate Editor 2013 — 2020.
- Annals of Statistics, Associate Editor 2008 — 2016.
- Journal of Machine Learning Research, Associate Editor 2007 — 2013.
- Information and Inference, Associate Editor 2011—2020

Professional organizations: Institute of Mathematical Statistics (IMS; Fellow), Institute of Electrical and Electronics Engineers (IEEE; Senior Member).

Workshop co-organizer (2015—present)

- *The interface of optimization and sampling*, Simons Institute, Fall 2021.
- *Topological and geometric data analysis*, Oberwolfach Institute for Mathematical Research, Germany, Spring 2017.
- *Statistical and computational tradeoffs*, Institute of Mathematical Statistics and Microsoft Research (IMS-MSR) Joint Workshop, June 2015.
- *Big data and large-scale optimization*, Fields Institute, Toronto, Canada, February, 2015

Books and Book Chapters

7. M. J. Wainwright. *High-dimensional statistics: A non-asymptotic viewpoint.* Cambridge University Press, Cambridge, UK, 2019

6. T. Hastie, R. Tibshirani, and M. J. Wainwright. *Statistical learning with sparsity: The Lasso and generalizations.* CRC Press, Chapman and Hall, New York, 2015

5. M. J. Wainwright. Structured regularizers for high-dimensional problems: Statistical and computational issues. In *Annual Review of Statistics and its Applications*, volume 1, pages 233–253, January 2014

4. M. J. Wainwright. Graphical models and message-passing algorithms: some introductory lectures. In *Mathematical foundations of complex networked information system*, volume 2141 of *Lecture Notes in Mathematics.* Springer, 2015

3. M. J. Wainwright and M. I. Jordan. Graphical models, exponential families and variational inference. *Foundations and Trends in Machine Learning*, 1:1—305, December 2008

2. M. J. Wainwright and M. I. Jordan. A variational principle for graphical models. In *New Directions in Statistical Signal Processing.* MIT Press, Cambridge, MA, October 2006

1. M. J. Wainwright, O. Schwartz, and E. P. Simoncelli. Natural image statistics and divisive normalization: Modeling nonlinearities and adaptation in cortical neurons. In P. Rao, B. Olshausen, and M. Lewicki, editors, *Statistical Theories of the Brain.* MIT Press, Cambridge, 2002

Journal Papers

117. W. Mou, A. Pananjady, M. J. Wainwright, and P. L. Bartlett. Optimal and instance-dependent guarantees for Markovian linear stochastic approximation. *Mathematical Statistics and Learning*, page To appear, 2023. Originally posted as arXiv:2112.12770

116. C. Ma, R. Pathak, and M. J. Wainwright. Optimally tackling covariate shift in RKHS-based nonparametric regression. *Annals of Statistics*, 2023. Posted originally as arXiv:2205.02986

115. N. Ho, K. Khamaru, R. Dwivedi, M. J. Wainwright, M. I. Jordan, and B. Yu. Instability, computational efficiency and statistical accuracy. *Journal of Machine Learning Research*, page To appear, November 2022. Originally posted as arxiv:2005.11411

114. R. Dwivedi, C. Singh, B. Yu, and M. J. Wainwright. Revisiting minimum description length complexity in overparameterized models. *Journal of Machine Learning Research*, November 2022. To appear

113. W. Mou, A. Pananjady, and M. J. Wainwright. Optimal oracle inequalities for solving projected fixed-point equations. *Mathematics of Operations Research*, 2022. To appear; Posted originally as arxiv:2021.05299

112. W. Mou, N. Flammarion, M. J. Wainwright, and P. L. Bartlett. An efficient sampling algorithm for non-smooth composite potentials. *Journal of Machine Learning Research*, 2022. To appear

111. W. Mou, N. Flammarion, M. J. Wainwright, and P. L. Bartlett. Improved bounds for discretization of Langevin diffusions: Near optimal rates without convexity. *Bernoulli*, 2021

110. K. Khamaru, A. Pananjady, F. Ruan, M. J. Wainwright, and M. I. Jordan. Is temporal difference learning optimal? An instance-dependent analysis. *SIAM J. Math. Data Science*, 3(4):1013–1040, October 2021

109. W. Mou, Y. Ma, M. J. Wainwright, P. L. Bartlett, and M. I. Jordan. High-order Langevin diffusion yields an accelerated MCMC algorithm. *Journal of Machine Learning Research*, 22:1–41, January 2021

108. A. Pananjady and M. J. Wainwright. Instance-dependent ℓ_∞-bounds for policy evaluation in tabular reinforcement learning. *IEEE Trans. Info. Theory*, 67(1):566–585, January 2021

107. C. Mao, A. Pananjady, and M. J. Wainwright. Towards optimal estimation of bivariate isotonic marices with unknown permutations. *Annals of Statistics*, 48(6):3183–3205, 2020

106. Y. Chen, R. Dwivedi, M. J. Wainwright, and B. Yu. Fast mixing of Metropolized Hamiltonian Monte Carlo: Benefits of multi-step gradients. *Journal of Machine Learning Research*, 21(92):1–72, May 2020

105. R. Dwivedi, N. Ho, K. Khamaru, M. J. Wainwright, M. I. Jordan, and B. Yu. Singularity, misspecification, and the convergence rate of EM. *Annals of Statistics*, 48(6):3161—3182, 2020

104. Y. Wei, B. Fang, and M. J. Wainwright. From Gauss to Kolmogorov: Localized measures of complexity for ellipses. *Electronic Journal of Statistics*, 14(2):2988–3031, 2020

103. Y. Chen, R. Dwivedi, M. J. Wainwright, and B. Yu. Fast mixing of Metropolized Hamiltonian Monte Carlo: Benefits of multi-step gradients. *Journal of Machine Learning Research*, 21(92):1–71, 2020

102. Y. Wei and M. J. Wainwright. The local geometry of testing in ellipses: Tight control via localized Kolmogorov widths. *IEEE Trans. Info. Theory*, 66(8):5110–5129, August 2020

101. A. Pananjady, C. Mao, V. Muthukumar, M. J. Wainwright, and T. A. Courtade. Worst-case vs average-case design for estimation from fixed pairwise comparisons. *Annals of Statistics*, 48(2):1072–1097, 2020

100. D. Malik, A. Panajady, K. Bhatia, K. Khamaru, P. L. Bartlett, and M. J. Wainwright. Derivative-free methods for policy optimization: Guarantees for linear-quadratic systems. *Journal of Machine Learning Research*, 51:1—51, 2020

99. R. Dwivedi, Y. Chen, M. J. Wainwright, and B. Yu. Log-concave sampling: Metropolis-Hastings algorithms are fast. *Journal of Machine Learning Research*, 20(183):1–42, 2019

98. K. Khamaru and M. J. Wainwright. Convergence guarantees for a class of non-convex and non-smooth optimization problems. *Journal of Machine Learning Research*, 20:1–52, 2019

97. N. B. Shah, S. Balakrishnan, and M. J. Wainwright. Low permutation-rank matrices: Structural properties and noisy completion. *Journal of Machine Learning Research*, 20:1–43, June 2019

96. Y. Wei, F. Yang, and M. J. Wainwright. Early stopping for kernel boosting algorithms: A general analysis with localized complexities. *IEEE Trans. Info. Theory*, 65(10):6685–6703, October 2019

95. M. Rabinovich, A. Ramdas, M. I. Jordan, and M. J. Wainwright. Function-specific mixing times and concentration away from equilibrium. *Bayesian Analysis*, 2:505–532, 2020

94. M. Rabinovich, A. Ramdas, M. J. Wainwright, and M. I. Jordan. Optimal rates and tradeoffs in multiple testing. *Statistica Sinica*, 30:741–762, 2020

93. N. B. Shah, S. Balakrishnan, and M. J. Wainwright. Feeling the Bern: Adaptive estimators for Bernoulli probabilities of pairwise comparisons. *IEEE Trans. Info. Theory*, 65(8):4854–4874, August 2019

92. Y. Wei, M. J. Wainwright, and A. Guntuboyina. The geometry of testing over convex cones: Generalized likelihood ratio tests and minimax radii. *Annals of Statistics*, 47(2):994–1024, 2019

91. R. Heckel, N. B. Shah, K. Ramchandran, and M. J. Wainwright. Active ranking from pairwise comparisons and when parametric assumptions don't help. *Annals of Statistics*, 47(6):3099–3126, 2019

90. Y. Chen, R. Dwivedi, M. J. Wainwright, and B. Yu. Fast MCMC sampling algorithms on polytopes. *Journal of Machine Learning Research*, 19:1–86, 2018

89. A. Ramdas, R. F. Barber, M. J. Wainwright, and M. I. Jordan. A unified treatment of multiple testing with prior knowledge using the p-filter. *Annals of Statistics*, 47(5):2790–2821, 2019

88. A. Ramdas, J. Chen, M. J. Wainwright, and M. I. Jordan. DAGGER: A sequential algorithm for FDR control on DAGs. *Biometrika*, 106(1):69–86, March 2019

87. N. B. Shah and M. J. Wainwright. Simple, robust and optimal ranking from pairwise comparisons. *Journal of Machine Learning Research*, 18:1—18, 2018

86. H. Mania, A. Ramdas, M. J. Wainwright, M. I. Jordan, and B. Recht. On kernel methods for covariates that are rankings. *Electronic Journal of Statistics*, 12:2537–2577, 2018

85. A. Pananjady, M. J. Wainwright, and T. A. Courtade. Linear regression with shuffled data: Statistical and computational limits of permutation recovery. *IEEE Transactions on Information Theory*, 64(5):3286–3300, 2018

84. J. C. Duchi, M. I. Jordan, and M. J. Wainwright. Minimax optimal procedures for locally private estimation. *Journal of the American Statistical Association*, 133(521):182–215, June 2018

83. F. Yang, S. Balakrishnan, and M. J. Wainwright. Statistical and computational guarantees for the Baum-Welch algorithm. *Journal of Machine Learning Research*, 18:1–53, 2018

82. S. Van de Geer and M. J. Wainwright. Concentration for (regularized) empirical risk minimization. *Sankhya A*, 79:159–200, August 2017

81. P. Loh and M. J. Wainwright. Support recovery without incoherence: A case for nonconvex regularization. *Annals of Statistics*, 45(6):2455–2482, 2017

80. M. Pilanci and M. J. Wainwright. Newton sketch: A linear-time optimization algorithm with linear-quadratic convergence. *SIAM Jour. Opt.*, 27(1):205–245, March 2017

79. S. Balakrishnan, M. J. Wainwright, and B. Yu. Statistical guarantees for the EM algorithm: From population to sample-based analysis. *Annals of Statistics*, 45(1):77—120, 2017

78. N. B. Shah, S. Balakrishnan, A. Guntuboyina, and M. J. Wainwright. Stochastically transitive models for pairwise comparisons: Statistical and computational issues. *IEEE Trans. Info. Theory*, 63(2):934–959, February 2017

77. Y. Yang, M. J. Wainwright, and M. I. Jordan. On the computational complexity of high-dimensional Bayesian variable selection. *Annals of Statistics*, 44(6):2497–2532, 2016

76. M. Chichignoud, J. Lederer, and M. J. Wainwright. A practical scheme and fast algorithm to tune the lasso with optimality guarantees. *Journal of Machine Learning Research*, 17:1–17, 2016

75. Y. Yang, M. Pilanci, and M. J. Wainwright. Randomized sketches for kernels: Fast and optimal non-parametric regression. *Annals of Statistics*, 45(3):991–1023, 2017

74. M. Pilanci and M. J. Wainwright. Iterative Hessian Sketch: Fast and accurate solution approximation for constrained least-squares. *Journal of Machine Learning Research*, 17(53):1–38, April 2016

73. N. B. Shah, S. Balakrishnan, J. Bradley, A. Parekh, K. Ramchandran, and M. J. Wainwright. Estimation from pairwise comparisons: Sharp minimax bounds with topology dependence. *Journal of Machine Learning Research*, 17(58):1–46, February 2016

72. Y. Zhang, J. C. Duchi, and M. J. Wainwright. Divide and conquer kernel ridge regression: A distributed algorithm with minimax optimal rates. *Journal of Machine Learning Research*, 16:3299–3340, December 2015

71. M. Pilanci and M. J. Wainwright. Randomized sketches of convex programs with sharp guarantees. *IEEE Trans. Info. Theory*, 9(61):5096–5115, September 2015

70. J. C. Duchi, M. I. Jordan, M. J. Wainwright, and A. Wibisono. Optimal rates for zero-order optimization: the power of two function evaluations. *IEEE Trans. Info. Theory*, 61(5):2788–2806, 2015

69. P. Loh and M. J. Wainwright. Regularized M-estimators with nonconvexity: Statistical and algorithmic theory for local optima. *Journal of Machine Learning Research*, 16:559–616, April 2015

68. G. Schiebinger, M. J. Wainwright, and B. Yu. The geometry of kernelized spectral clustering. *Annals of Statistics*, 43(2):819–846, 2015

67. M. Pilanci, M. J. Wainwright, and L. El Ghaoui. Sparse learning via Boolean relaxations. *Mathematical Programming*, 151(1):63–87, June 2015

66. J. C. Duchi, M. J. Wainwright, and M. I. Jordan. Privacy-aware learning. *Journal of the ACM*, 61(6):Article 37, November 2014

65. M. J. Wainwright. Constrained forms of statistical minimax: Computation, communication and privacy. In *Proceedings of the International Congress of Mathematicians*, Seoul, Korea, 2014

64. G. Raskutti, M. J. Wainwright, and B. Yu. Early stopping and non-parametric regression: An optimal data-dependent stopping rule. *Journal of Machine Learning Research*, 15:335–366, 2014

63. P. Loh and M. J. Wainwright. Structure estimation for discrete graphical models: Generalized covariance matrices and their inverses. *Annals of Statistics*, 41(6):3022–3049, December 2013

62. Y. Zhang, J. C. Duchi, and M. J. Wainwright. Communication-efficient algorithms for statistical optimization. *Journal of Machine Learning Research*, 14:3321–3363, November 2013

61. N. Noorshams and M. J. Wainwright. Belief propagation for continuous state spaces: Stochastic message-passing with quantitative guarantees. *Journal of Machine Learning Research*, 14:2799–2835, 2013

60. N. Noorshams and M. J. Wainwright. Stochastic belief propagation: A low-complexity alternative to the sum-product algorithm. *IEEE Trans. Info. Theory*, 59(4):1981–2000, April 2013

59. S. Negahban, P. Ravikumar, M. J. Wainwright, and B. Yu. A unified framework for high-dimensional analysis of M-estimators with decomposable regularizers. *Statistical Science*, 27(4):538–557, December 2012

58. A. Agarwal, S. Negahban, and M. J. Wainwright. Fast global convergence of gradient methods for high-dimensional statistical recovery. *Annals of Statistics*, 40(5):2452–2482, 2012

57. M. J. Wainwright. Discussion: Latent graphical model selection by convex optimization. *Annals of Statistics*, 40(4):1978–1983, 2012

56. P. Loh and M. J. Wainwright. High-dimensional regression with noisy and missing data: Provable guarantees with non-convexity. *Annals of Statistics*, 40(3):1637–1664, September 2012

55. A. Agarwal, S. Negahban, and M. J. Wainwright. Noisy matrix decomposition via convex relaxation: Optimal rates in high dimensions. *Annals of Statistics*, 40(2):1171–1197, 2012

54. N. P. Santhanam and M. J. Wainwright. Information-theoretic limits of selecting binary graphical models in high dimensions. *IEEE Trans. Info Theory*, 58(7):4117–4134, May 2012

53. A. A. Amini and M. J. Wainwright. Sampled forms of functional PCA in reproducing kernel Hilbert spaces. *Annals of Statistics*, 40(5):2483–2510, 2012

52. G. Raskutti, M. J. Wainwright, and B. Yu. Minimax-optimal rates for sparse additive models over kernel classes via convex programming. *Journal of Machine Learning Research*, 12:389–427, March 2012

51. S. Negahban and M. J. Wainwright. Restricted strong convexity and (weighted) matrix completion: Optimal bounds with noise. *Journal of Machine Learning Research*, 13:1665–1697, May 2012

50. A. Agarwal, P. L. Bartlett, P. Ravikumar, and M. J. Wainwright. Information-theoretic lower bounds on the oracle complexity of stochastic convex optimization. *IEEE Trans. Info. Theory*, 58(5):3235–3249, May 2012

49. J. C. Duchi, P. L. Bartlett and M. J. Wainwright (2012). Randomized smoothing for stochastic optimization. *SIAM Journal on Optimization*, 22(2):674–701, July 2012.

48. J. Duchi, A. Agarwal and M. J. Wainwright (2012). Dual averaging for distributed optimization: Convergence analysis and network scaling. *IEEE Transactions on Automatic Control*, 57(3):592–606, March 2012.

47. R. Rajagopal and M. J. Wainwright (2011). Network-based consensus averaging with general noisy channels. *IEEE Transactions on Signal Processing*, 59(1):373–385, January 2011.

46. N. Noorshams and M. J. Wainwright (2011). Non-asymptotic analysis of an optimal algorithm for network-constrained averaging with noisy links. *IEEE Journal on Selected Areas in Signal Processing*, 5(4):833—844, August 2011.

45. G. Raskutti, M. J. Wainwright and B. Yu (2011). Minimax rates of estimation for linear regression over ℓ_q-balls. *IEEE Transactions on Information Theory*, 57(10):6976–6994, October 2011.

44. P. Ravikumar, M. J. Wainwright, G. Raskutti, and B. Yu (2011). High-dimensional covariance estimation by minimizing ℓ_1-penalized log-determinant divergence. *Electronic Journal of Statistics*, 5:935–980, August 2011.

43. S. Negahban and M. J. Wainwright (2011). Phase transitions for high-dimensional joint support recovery: Benefits and perils of $\ell_{1,\infty}$ regularization. *IEEE Transactions on Information Theory*, 57(6):3841–3863, June 2011.

42. S. Negahban and M. J. Wainwright (2011). Estimation of (near) low-rank matrices with noise and high-dimensional scaling. *Annals of Statistics*, 39(2):1069–1097, June 2011.

41. G. Obozinski, M. J. Wainwright and M. I. Jordan (2011). Union support recovery in high-dimensional multivariate regression. *Annals of Statistics*, 39(1):1–47, January 2011.

40. A. A. Amini and M. J. Wainwright (2011). Approximation properties of certain operator-induced norms on Hilbert spaces. *Journal of Approximation Theory*, 164: 320–345, December 2011.

39. X. Nguyen, M. J. Wainwright, and M. I. Jordan (2010). Estimating divergence functionals and the likelihood ratio by convex risk minimization. *IEEE Transactions on Information Theory*, 56(11):5847–5861, November 2010.

38. D. Omidiran and M. J. Wainwright (2010). High-dimensional variable selection with sparse random projections: Measurement sparsity and statistical efficiency. *Journal of Machine Learning Research*, Vol. 11: 2361–2386, August 2010.

37. G. Raskutti, M. J. Wainwright and B. Yu (2010). Restricted nullspace and eigenvalue properties for correlated Gaussian designs. *Journal of Machine Learning Research*. Vol. 11: 2241–2259, August 2010.

36. P. Ravikumar, M. J. Wainwright and J. Lafferty (2010). High-dimensional graphical model selection using ℓ_1-regularized logistic regression. *Annals of Statistics*, 38(3):1287—1319, June 2010.

35. A. G. Dimakis, P. B. Godfrey, Y. Wu, M. J. Wainwright, and K. Ramchandran. Network coding for distributed storage systems. *IEEE Trans. Info. Theory*, 56(9):4539–4551, September 2010

34. Z. Zhang, V. Anantharam, M. J. Wainwright, and V. Anantharam. An efficient 10GBASE-T Ethernet LDPC decoder design with low error floors. *IEEE Jour. Solid-State Circuits*, 45(4):843–855, March 2010

33. M. J. Wainwright, E. Maneva, and E. Martinian. Lossy source compression using low-density generator matrix codes: Analysis and algorithms. *IEEE Trans. Info. Theory*, 56(3):1351–1368, March 2010

32. P. Ravikumar, A. Agarwal, and M. J. Wainwright. Message-passing for graph-structured linear programs: Proximal projections, convergence and rounding schemes. *Journal of Machine Learning Research*, 11:1043–1080, March 2010

31. W. Wang, M. J. Wainwright, and K. Ramchandran. Information-theoretic limits on sparse signal recovery: Dense versus sparse measurement matrices. *IEEE Trans. Info Theory*, 56(6):2967–2979, June 2010

30. A. A. Amini and M. J. Wainwright. High-dimensional analysis of semdefinite relaxations for sparse principal component analysis. *Annals of Statistics*, 5B:2877–2921, 2009

29. M. J. Wainwright. Sharp thresholds for high-dimensional and noisy sparsity recovery using ℓ_1-constrained quadratic programming (Lasso). *IEEE Trans. Info. Theory*, 55:2183–2202, May 2009

28. X. Nguyen, M. J. Wainwright, and M. I. Jordan. On surrogate losses and f-divergences. *Annals of Statistics*, 37(2):876–903, 2009

27. M. J. Wainwright. Information-theoretic bounds on sparsity recovery in the high-dimensional and noisy setting. *IEEE Trans. Info. Theory*, 55:5728–5741, December 2009

26. A. G. Dimakis, A. Sarwate, and M. J. Wainwright. Geographic gossip: Efficient averaging for sensor networks. *IEEE Trans. Signal Processing*, 53:1205–1216, March 2008

25. T. G. Roosta, M. J. Wainwright, and S. S. Sastry. Convergence analysis of reweighted sum-product algorithms. *IEEE Trans. Signal Processing*, 56(9):4293–4305, September 2008

24. X. Nguyen, M. J. Wainwright, and M. I. Jordan. On optimal quantization rules for some sequential decision problems. *IEEE Trans. Info. Theory*, 54(7):3285–3295, July 2008

23. L. Dolecek, Z. Zhang, V. Anantharam, M. J. Wainwright, and B. Nikolic. Analysis of absorbing sets and fully absorbing sets for array-based ldpc codes. *IEEE Trans. Info. Theory*, 56(1):181–201, January 2009

22. Z. Zhang, L. Dolocek and B. Nikolic, V. Anantharam, and M. J. Wainwright (2009). Design of LDPC Decoders for Low Bit Error Rate Performance: Quantization and Algorithms. *IEEE Transactions on Communications*, 57(11):3258–3268, November 2009.

21. L. Dolecek, P. Lee, Z. Zhang, V. Anantharam, B. Nikolic, and M. J. Wainwright. Predicting error floors of structured LDPC codes: Deterministic bounds and estimates. *IEEE Jour. Sel. Areas. Comm*, 27(6):908–917, August 2009

20. A. D. Dimakis, A. Gohari and M. J. Wainwright (2009). Guessing Facets: Improved LP decoding and Polytope Structure. *IEEE Transactions on Information Theory* 55(8): 3479 - 3487, August 2009.

19. M. J. Wainwright and E. Martinian (2009). Low-density graph codes that are optimal for binning and coding with side information. *IEEE Transactions on Information Theory*, 55(3): 1061–1079. March 2009.

18. C. Daskalakis, A. D. Dimakis, R. Karp, and M. J. Wainwright (2008). Probabilistic analysis of linear programming decoding. *IEEE Transactions on Information Theory*, Vol. 54(8), pp. 3565 - 3578, August 2008.

17. M. J. Wainwright (2007). Sparse graph codes for lossy data compression and binning. *IEEE Signal Processing Magazine*, 24(5):47–57, November 2007.

16. J. Feldman, T. Malkin, R. A. Servedio, C. Stein, and M. J. Wainwright (2007). LP Decoding Corrects a Constant Fraction of Errors. *IEEE Transactions on Information Theory*, 53(1):82–89, January 2007.

15. E. Maneva, E. Mossel and M. J. Wainwright. (2007). A new look at survey propagation and its generalization. *Journal of the ACM*, 54(4):2—41, July 2007.

14. M. J. Wainwright (2006). Estimating the "wrong" graphical model: Benefits in the computation-limited regime. *Journal of Machine Learning Research*. September, 43:1829–1859.

13. M. J. Wainwright and M. I. Jordan (2006). Semidefinite constraints in convex relaxations for approximate inference in graphical models. *IEEE Transactions on Signal Processing*, Vol. 54(6): 2099–2109, June 2006.

12. M. Cetin, L. Chen, J. Fisher, A. Ihler, R. Moses, M. J. Wainwright and A. S. Willsky, (2006). Distributed Fusion in Sensor Networks: A Graphical Models Perspective graphical models. *IEEE Signal Processing Magazine*, May 2006, Vol. 23, pages 42–55.

11. X. Nguyen, M. J. Wainwright, and M. I. Jordan (2005) Decentralized detection and classification using kernel methods. *IEEE Transactions on Signal Processing*. 53:4053–4066, November 2005.

10. M. J. Wainwright, T. S. Jaakkola, and A. S. Willsky (2005). A new class of upper bounds on the log partition function. *IEEE Transactions on Information Theory.* 51:2313–2335, July 2005.

9. M. J. Wainwright, T. S. Jaakkola, T. S. and A. S. Willsky (2005). Exact MAP estimates via agreement on (hyper)trees: Message-passing and linear programming approaches. *IEEE Transactions on Information Theory.* 51:3697–3717, November 2005.

8. J. Feldman, M. J. Wainwright and D. R. Karger (2005). Using linear programming to decode binary linear codes. *IEEE Transactions on Information Theory*, 51:954–972, March 2005.

7. L. Chen, M. J. Wainwright, M. Cetin and A. S. Willsky (2005). Data association based on optimization in graphical models with application to sensor networks, *Mathematical and Computer Modelling*, pp. 51–74, February 2005

6. M. J. Wainwright, T. S. Jaakkola, and A. S. Willsky (2004). Tree consistency and bounds on the performance of the max-product algorithm and its generalizations. *Statistics and Computing*, 14:143–166, April 2004.

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3. J. Portilla, V. Strela, M. J. Wainwright and E. P. Simoncelli (2003). Image denoising using scale mixtures of Gaussians in the wavelet domain. *IEEE Transactions on Image Processing*, 12:1338–1351, November 2003.

2. M. J. Wainwright, E. P. Simoncelli and A. S. Willsky (2001) Random cascades on wavelet trees and their use in modeling and analyzing natural images, *Applied Computational and Harmonic Analysis*, 11:89–123, January 2001.

1. M. J. Wainwright (1999) Visual adaptation as optimal information transmission. *Vision Research*, 39:3960–3974, February 1999.

Pre-prints

17. R. Pathak, M. J. Wainwright, and L. Xiao. Noisy recovery from random linear observations: Sharp minimax rates under elliptical constraints. Technical report, MIT, March 2023. arxiv::2303.12613

16. W. Mou, P. Ding, P. L. Bartlett, and M. J. Wainwright. Kernel-based off-policy estimation with overlap: Instance-optimality beyond semi-parametric efficiency. Technical report, MIT, January 2023

15. Y. Duan and M. J. Wainwright. Policy evaluation from a single path: Multi-step methods, mixing and mis-specification. Technical report, MIT, November 2022. arXiv:2211.03899

14. W. Mou, M. J. Wainwright, and P. L. Bartlett. Off-policy estimation of linear functionals: Non-asymptotic theory for semi-parametric efficiency. Technical report, MIT, September 2022. arxiv:2209.13075

13. E. Xia and M. J. Wainwright. Krylov-Bellman boosting: Super-linear policy evaluation in general state spaces. Technical report, MIT, October 2022. Pre-print arxiv 2210:11377

12. A. Zanette and M. J. Wainwright. Bellman residual orthogonalization for offline reinforcement learning. Technical report, UC Berkeley, March 2022. arxiv:2203.12786

11. A. Zanette and M. J. Wainwright. Stabilizing Q-learning with linear architectures for provably efficient learning. Technical report, UC Berkeley, May 2022

10. E. Xia, K. Khamaru, M. J. Wainwright, and M. I. Jordan. Instance-dependent confidence and early stopping in reinforcement learning. Technical report, UC Berkeley, January 2022

9. W. Mou, K. Khamaru, M. J. Wainwright, P. L. Bartlett, and M. I. Jordan. Optimal variance-reduced stochastic approximation in Banach spaces. Technical report, UC Berkeley, January 2022

8. Y. Duan, M. J. Wainwright, and M. Wang. Optimal value estimation using kernel-based temporal difference methods. Technical report, Princeton University, September 2021

7. K. Khamaru, Y. Deshpande, L. Mackey, and M. J. Wainwright. Near-optimal inference in adaptive linear regression. Technical report, UC Berkeley, July 2021. Arxiv technical report 2107.02266

6. K. Khamaru, E. Xia, M. J. Wainwright, and M. I. Jordan. Instance-optimality in optimal value estimation: Adaptivity via variance-reduced Q-learning. Technical report, UC Berkeley, June 2021. Arxiv technical report 2106.14352

5. M. Rabinovich, M. I. Jordan, and M. J. Wainwright. Lower bounds in multiple testing: A framework based on derandomized proxies. Technical report, UC Berkeley, May 2020. arxiv:2005.03725

4. W. Mou, N. Ho, M. J. Wainwright, P. Bartlett, and M. I. Jordan. A diffusion process perspective on posterior contraction rates for parameters. Technical report, UC Berkeley, September 2019

3. M. J. Wainwright. Variance-reduced Q-learning is minimax optimal. Technical report, UC Berkeley, June 2019. arxiv:1906.04697

2. M. J. Wainwright. Stochastic approximation with cone-contractive operators: Sharp ℓ_∞-bounds for Q-learning. Technical report, UC Berkeley, May 2019. arxiv:1905.06265

1. Y. Chen and M. J. Wainwright. Fast low-rank estimation by projected gradient descent: General statistical and algorithmic guarantees. Technical report, UC Berkeley, September 2015. arxiv:1509.03025.pdf

Refereed Conference Proceedings

109. E. Xia and M. J. Wainwright. Krylov-Bellman boosting: Super-linear policy evaluation in general state spaces. In *Conference on Artificial Intellgence and Statistics*, April 2023

108. A. Zanette and M. J. Wainwright. Bellman residual orthogonalization for offline reinforcement learning. In *Neural Information Processing Systems*, December 2022. Long version posted as arxiv:2203.12786 **Oral presentation**

107. C. J. Li, W. Mou, M. J. Wainwright, and M. I. Jordan. ROOT-SGD: Sharp Nonasymptotics and Asymptotic Efficiency in a Single Algorithm. In *Conference on Learning Theory*, July 2022

106. W. Mou, A. Pananjady, M. J. Wainwright, and P. L. Bartlett. Optimal and instance-dependent guarantees for Markovian linear stochastic approximation. In *Conference on Learning Theory*, July 2022

105. A. Zanette and M. J. Wainwright. Stabilizing Q-learning with linear architectures for provably efficient learning. In *International Conference on Machine Learning*, Baltimore, MD, July 2022

104. R. Pathak, C. Ma, and M. J. Wainwright. A new similarity measure for covariate shift with applications to nonparametric regression. In *International Conference on Machine Learning*, Baltimore, MD, July 2022

103. A. Zanette, M. J. Wainwright, and E. Brunskill. Provable benefits of actor-critic methods in offline reinforcement learning. In *Neural Information Processing Systems*, December 2021. arXiv:2108.08812

102. K. Bhatia, A. Pananjady, P. L. Bartlett, A. D. Dragan, and M. J. Wainwright. Preference learning along multiple criteria: A game-theoretic perspective. In *Neural Information Processing Systems*, 2020

101. R. Pathak and M. J. Wainwright. FedSplit: An algorithmic framework for fast federated optimization. In *NeurIPS (Neural Information Processing Systems)*, December 2020

100. W. Mou, C. J. Li, M. J. Wainwright, P. L. Bartlett, and M. I. Jordan. On linear stochastic approximation: Fine-grained Polyak-Ruppert and non-asymptotic concentration. In *Conference on Learning Theory (COLT)*, volume 125, pages 2947–2997, 2020

99. R. Dwivedi, K. Khamaru, N. Ho, M. J. Wainwright, M. I. Jordan, and B. Yu. Sharp analysis of expectation-maximization for weakly identifiable models. In *AISTATS*, 2021

98. J. Chen, M. I. Jordan, and M. J. Wainwright. HopSkipJump Attack: A query-efficient decision-based attack. In *IEEE Conference on Security and Privacy*, October 2019

97. D. Malik, A. Pananjady, K. Bhatia, K. Khamaru, P. L. Bartlett, and M. J. Wainwright. Derivative-free methods for policy optimization: Guarantees for linear-quadratic systems. In *AISTATS: Conference on AI and Statistics*, 2019

96. R. Dwivedi, N. Ho, K. Khamaru, M. J. Wainwright, and M. I. Jordan. Theoretical guarantees for the EM algorithm when applied to misspecified Gaussian mixture models. In *NeurIPS Conference*, Montreal, Canada, December 2018

95. J. Chen, L. Song, M. J. Wainwright, and M. I. Jordan. Learning to explain: An information-theoretic perspective on model interpretation. In *ICML: International Conference on Machine Learning*, Stockholm, Sweden, 2018

94. K. Khamaru and M. J. Wainwright. Convergence guarantees for a class of non-convex and non-smooth optimization problems. In *ICML: International Conference on Machine Learning*, Stockholm, Sweden, 2018

93. R. Dwivedi, Y. Chen, M. J. Wainwright, and B. Yu. Log-concave sampling: Metropolis-Hastings algorithms are fast. In *COLT: Conference on Computational Learning Theory*, Stockholm, Sweden, 2018

92. R. Heckel, M. Simchowitz, K. Ramchandran, and M. J. Wainwright. Approximate ranking from pairwise comparisons. In *AISTATS: Conference on AI and Statistics*, volume 84, pages 1057–1066, 2018

91. F. Yang, Y. Wei, and M. J. Wainwright. Early stopping for kernel boosting algorithms: A general analysis with localized complexities. In *NIPS (Neural Information Processing Systems)*, 2017

90. A. Ramdas, F. Yang, M. J. Wainwright, and M. I. Jordan. Online control of false discovery rate with decaying memory. In *Neural Information Processing Systems*, December 2017

16

89. J. Chen, M. Stern, M. J. Wainwright, and M. I. Jordan. Kernel feature selection via conditional covariance minimization. In *NIPS: Advances in Neural Information Processing Systems*, pages 6949–6958, 2017

88. F. Yang, A. Ramdas, K. Jamieson, and M. J. Wainwright. A framework for multi-armed bandit testing with online FDR control. In *Neural Information Processing Systems*, December 2017

87. A. Ramdas, J. Chen, M. J. Wainwright, and M. I. Jordan. Qute: Decentralized multiple testing on sensor networks with false discovery rate control. In *56th IEEE Conference on Decision and Control (CDC)*, 12 2017

86. A. Pananjady, M. J. Wainwright, and T. Courtade. Denoising linear models with permuted data. In *ISIT: IEEE International Symposium on Information Theory*, 2017

85. Y. Zhang, J. Lee, M. J. Wainwright, and M. I. Jordan. On the learnability of fully-connected neural networks. In *AISTATS*, April 2017

84. C. Jin, S. Balakrishnan, M. J. Wainwright, and M. I. Jordan. Local maxima in the likelihood of gaussian mixture models: Structural results and algorithmic consequences. In *NIPS Conference*, December 2016

83. A. El Alaoui, X. Cheng, A. Ramdas, M. J. Wainwright, and M. I. Jordan. Asymptotic behavior of ℓ_p-based laplacian regularization in semi-supervised learning. In *COLT: Conference on Learning Theory*, New York, NY, June 2016

82. N. B. Shah, S. Balakrishnan, and M. J. Wainwright (2016), Stochastically Transitive Models for Pairwise Comparisons: Statistical and Computational Issues. International Conference on Machine Learning, New York, NY, June 2016.

81. Y. Wei and M. J. Wainwright. Sharp minimax rates for testing monotone distributions. In *International Symposium on Information Theory*, July 2016

80. N. B. Shah, S. Balakrishnan and M. J. Wainwright (2016). Feeling the Bern: Adaptive Estimators for Bernoulli Probabilities of Pairwise Comparisons, International Symposium on Information Theory, July 2016.

79. F. Yang, S. Balakrishnan and M. J. Wainwright (2015), Statistical and Computational Guarantees for the Baum-Welch algorithm. Proceedings of the Allerton Conference on Control, Communication and Computing, October 2015.

78. N. B. Shah, S. Balakrishnan, J. Bradley, A. Parekh, K. Ramchandran, and M. J. Wainwright (2015). Estimation from Pairwise Comparisons: Sharp Minimax Bounds with Topology Dependence Nihar, Conference on Artificial Intelligence and Statistics (AISTATS 2015).

77. Y. Zhang, M. J. Wainwright, and M. I. Jordan (2015). Distributed estimation of generalized matrix rank: Efficient algorithms and lower bounds. Proceedings of 32nd International Conference on Machine Learning, pp. 457–465, 2015.

76. M. Pilanci and M. J. Wainwright (2014). Randomized sketches of convex programs with sharp guarantees. IEEE International Symposium on Information Theory (ISIT), July 2014.

75. Y. Zhang, M. J. Wainwright and M. I. Jordan (2014). Lower Bounds on the Performance of Polynomial-time Algorithms for Sparse Linear Regression. Conference on Learning Theory, Princeton, NJ, June 2014.

74. P. Loh and M. J. Wainwright (2013). Structure estimation for discrete graphical models: Generalized covariance matrices and their inverses. NIPS Conference, Granada, CA, December 2013. **Oral presentation**. **Best student paper award**

73. Y. Zhang, J. Duchi, M. I. Jordan and M. J. Wainwright (2013). Information-theoretic Lower Bounds for Distributed Statistical Estimation with Communication Constraints. Neural Information Processing System NIPS Conference, Granada, CA, December 2013.

72. J. C. Duchi, M. I. Jordan and M. J. Wainwright (2013). Local Privacy and Statistical Minimax Rates, 54th Annual Symposium on Foundations of Computer Science (FOCS 2013).

71. Y. Zhang, J. Duchi and M. J. Wainwright (2013). Divide and Conquer Kernel Ridge Regression, Conference on Learning Theory, June 2013.

70. A. Agarwal, S. Negahban and M. J. Wainwright (2012), Stochastic optimization and sparse statistical recovery: An optimal algorithm for high dimensions. NIPS Conference, December 2012.

69. J. C. Duchi, M. I. Jordan, M. J. Wainwright, and A. Wibisono. Finite Sample Convergence Rates of Zero-Order Stochastic Optimization Methods. NIPS Conference, December 2012.

68. J. C. Duchi, M. I. Jordan and M. J. Wainwright (2012), Privacy Aware Learning, NIPS Conference, December 2012.

67. Y. Zhang, J. Duchi and M. J. Wainwright (2012) Communication-Efficient Algorithms for Statistical Optimization, NIPS Conference, December 2012.

66. J. C. Duchi, P. L. Bartlett, and M. J. Wainwright (2012). Randomized Smoothing for (Parallel) Stochastic Optimization, International Conference on Machine Learning (ICML 2012)

65. P. Loh and M. J. Wainwright (2011). High-dimensional regression with noisy and missing data: Provable guarantees with non-convexity. NIPS Conference, Granada, Spain, December 2011. **Oral presentation**.

64. M. Lopes, L. Jacob, and M. J. Wainwright (2011). A more powerful two-sample test in high dimensions using random projection. NIPS Conference, Granada, Spain, December 2011.

63. G. Raskutti, M. J. Wainwright and B. Yu (2011). Early stopping of gradient descent over kernel classes: Optimal stopping rules and rates of convergence. *Allerton Conference on Control, Computing and Communication*, Urbana-Champaign, Illinois, October 2011.

62. N. Noorshams and M. J. Wainwright (2011). Stochastic Belief Propagation: Low-Complexity Message-Passing with Guarantees. *Allerton Conference on Control, Computing and Communication*, Urbana-Champaign, Illinois, October 2011.

61. A. Agarwal, S. Negahban and M. J. Wainwright (2011). Minimax optimal rates for noisy matrix decomposition via semidefinite programming. *ICML Conference*, Portland, Oregon, June 2011.

60. J. Duchi, A. Agarwal and M. J. Wainwright (2010). Dual averaging for distributed optimization: Convergence analysis and network scaling. *NIPS Conference*, Vancouver, Canada. December 2010.

59. A. Agarwal, S. Negahban and M. J. Wainwright (2010). Fast convergence rates of gradient methods for high-dimensional statistical recovery. *NIPS Conference*, Vancouver, Canada. December 2010. **Oral presentation**.

58. N. Noorshams and M. J. Wainwright (2010). Lossy source coding with sparse graph codes: A variational interpretation of soft decimation. *Allerton Conference on Control, Computing and Communication*, Urbana-Champaign, Illinois, October 2010.

57. S. Negahban and M. J. Wainwright (2010). Estimation of (near) low-rank matrices under noise and high-dimensional scaling. *International Conference on Machine Learning*, Haifa, Israel. July 2010.

56. N. Noorshams and M. J. Wainwright (2010). A near-optimal algorithm for consensus averaging with stochastic channels. *International Symposium on Information Theory*, Austin, TX. June 2010.

55. W. Wei, M. J. Wainwright and K. Ramchandran (2010). Information-theoretic lower bounds on Gaussian graphical model selection *International Symposium on Information Theory*, Austin, TX. June 2010.

54. A. Agarwal, P. Ravikumar, M. J. Wainwright and P. Bartlett (2009). Information-theoretic lower bounds on the oracle complexity of optimization. *NIPS Conference*, Vancouver, Canada, December 2009.

53. S. Negahban, P. Ravikumar, M. J. Wainwright and B. Yu (2009). A unified framework for high-dimensional analysis of M-estimators with decomposable regularizers. *NIPS conference*, Vancouver, Canada, December 2009. **Oral presentation**.

52. G. Raskutti, M. J. Wainwright and B. Yu (2009). Lower bounds on estimating sparse additive models. *NIPS Conference*, Vancouver, Canada, December 2009.

51. G. Raskutti, M. J. Wainwright and B. Yu (2009). Minimax rates of estimation for linear regression over ℓ_q-balls. *Allerton Conference on Control, Communication and Computing*, Monticello, IL. September 2009

50. P. Ravikumar, A. Agarwal and M. J. Wainwright (2008). Message-passing for graph-structured linear programs: Proximal projections, convergence, and rounding schemes. *International Conference on Machine Learning (ICML),* Helsinki, Finland. July, 2008.

49. P. Santhanam and M. J. Wainwright (2008). Information-theoretic limits of graphical model selection in high dimensions. *International Symposium on Information Theory (ISIT)*, Toronto, Canada. July, 2008

48. P. Lee, L. Dolecek, Z. Zhang, V. Anantharam, B. Nikolic and M. J. Wainwright (2008). Error Floors in LDPC Codes: Fast Simulation, Bounds and Hardware Emulation. *IEEE International Symposium on Information Theory (ISIT)*, Toronto, Canada, July 2008.

47. W. Wang, M. J. Wainwright and K. Ramchandran (2008). Information-theoretic limits on sparse signal recovery: Dense versus sparse measurement matrices. *International Symposium on Information Theory (ISIT),* Toronto, Canada, July 2008.

46. D. Omidiran and M. J. Wainwright (2008). High-dimensional subset recovery in noise: Sparsified measurements without loss statistical efficiency. *International Symposium on Information Theory (ISIT),* Toronto, Canada, July 2008.

45. A. A. Amini and M. J. Wainwright (2008). High-dimensional analysis of semidefinite programming relaxations for sparse principal component analysis. *International Symposium on Information Theory (ISIT)*, Toronto, Canada, July 2008.

44. Sudderth, E, Wainwright, M.J. and Willsky, A.S. (2008). Loop series and Bethe variational bounds for attractive graphical models. *Neural Information Processing Systems,* Vancouver, Canada. December 2007.

43. L. Dolecek, Z. Zhang, M. J. Wainwright, V. Anantharam and B. Nikolic (2007). Evaluation of the low frame error rate performance of LDPC codes using importance sampling. *Information Theory Workshop*, Lake Tahoe, September 2007.

42. A. Dimakis, M. J. Wainwright and K. Ramchandran (2007). Lower bounds on the rate-distortion of LDGM codes. *Information Theory Workshop*, Lake Tahoe, September 2007.

41. M. J. Wainwright (2007). Information-theoretic limitations on sparsity recovery in the high-dimensional and noisy setting. *International Symposium on Information Theory*, Nice, France, July 2007.

40. X. Nguyen, M. J. Wainwright and M. Jordan (2007). Non-parametric estimation of Kullback-Leibler and f-divergence functionals. *International Symposium on Information Theory*, Nice, France, July 2007.

39. Zhang, Z., Dolecek, L., Anantharam, V., Wainwright, M. J. and Nikolic, B. (2007) Quantization Effects in Low-Density Parity Check Decoders. *International Conference on Communications (ICC)*, June, Glasgow, Scotland.

38. L. Dolecek, Z. Zhang, V. Anantharam, M. J. Wainwright, and B. Nikolic (2007) Analysis of Absorbing Sets for Array-based LDPC Codes. *International Conference on Communications (ICC)*, June, Glasgow, Scotland.

37. A. G. Dimakis, B. Godfrey, M. J. Wainwright and K. Ramchandran (2007) Network coding for distributed storage systems. *INFOCOM*, May, Anchorage, AL.

36. T. Roosta, M. J. Wainwright and S. Sastry (2007). Convergence Analysis of Reweighted Sum-Product Algorithms. *International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, April, Honolulu, HI. (**Honorable mention: Best student paper award**)

35. J. Schiff, D. Antonelli, A. G. Dimakis, D. Chu and M. J. Wainwright (2007). Robust Message-Passing for Statistical Inference in Sensor Networks. *Information Processing in Sensor Networks (IPSN)*. April, Boston, MA.

34. M. J. Wainwright, P. Ravikumar and J. Lafferty (2006). Graphical model selection by ℓ_1-regularized logistic regression. *Advances in Neural Information Processing Systems (NIPS)*, December, 2006.

33. Z. Zhang, L. Dolecek, B. Nikolic, V. Anantharam and M. J. Wainwright (2006). Investigation of error-floors of structured low-density parity check codes by hardware emulation. *GLOBECOM 2006*, November, San Francisco, CA. (**Honorable mention: Best student paper award**)

32. A. G. Dimakis and M. J. Wainwright (2006). Guessing Facets: Improved LP decoding and Polytope Structure. *International Symposium on Information Theory*, July. Seattle, Washington,

31. R. Rajagopal, M. J. Wainwright and P. Varaiya (2006). Universal quantile estimation with feedback in the communication-constrained setting. *International Symposium on Information Theory*, July. Seattle, Washington.

30. X. Nguyen, M. J. Wainwright and M. I. Jordan. (2006). On optimal quantization rules for some sequential decision problems. *International Symposium on Information Theory*, July. Seattle, Washington.

29. E. Martinian and M. J. Wainwright (2006). Low-density codes can achieve the Wyner-Ziv and Gelfand-Pinkser bounds. *International Symposium on Information Theory*, July. Seattle, WA.

28. E. Martinian, E. and M. J. Wainwright (2006). Low-density codes achieve the rate-distortion bound. *Data Compression Conference*, March, Snowbird, UT.

27. A. G. Dimakis, A. Sarwate and M. J. Wainwright (2006). Geographic Gossip: Efficient Aggregation in Sensor Networks, *Information Processing in Sensor Networks*, April, Nashville, TN.

26. E. Martinian and M. J. Wainwright (2006). Analysis of LDGM and compound codes for compression and binning. *Workshop on Information Theory and its Applications*, January, San Diego, CA.

25. X. Nguyen, M. J. Wainwright and M. I. Jordan. (2005). On divergence measures, convex surrogates, and decentralized detection. methods. *Neural Information Processing Systems*, Vancouver, Canada.

24. M. J. Wainwright and E. Maneva (2005). Lossy source coding via message-passing and decimation over generalized codewords of LDGM codes. *International Symposium on Information Theory*, Adelaide, Australia.

23. M. J. Wainwright (2005). Joint parameter estimation and prediction: Stable message-passing and convex surrogates. *IEEE Workshop on Statistical Signal Processing*, Bordeaux, France.

22. V. Kolmogorov and M. J. Wainwright (2005). On the optimality of tree-reweighted max-product message-passing. *Uncertainty in Artificial Intelligence,* Edinburgh, Scotland.

21. E. Maneva, E. Mossel and M. J. Wainwright (2005). A new look at survey propagation and its generalizations. *Symposium on Discrete Algorithms (SODA)*, Vancouver, Canada.

20. X. Nguyen, M. J. Wainwright and M. I. Jordan (2004). Decentralized detection and classification using kernel methods. *International Conference on Machine Learning,* Banff, Canada. **(Outstanding Student Paper Award)**

19. J. Feldman, R. A. Servedio, C. Stein and M. J. Wainwright (2004) LP Decoding corrects a constant fraction of errors. *IEEE International Symposium on Information Theory,* Chicago, IL.

18. M. J. Wainwright and M. I. Jordan (2003). Semidefinite relaxations for approximate inference on graphs with cycles. *Neural Information Processing Systems 16,* Vancouver, Canada.

17. J. Feldman, M. J. Wainwright and D. R. Karger (2003). LP Decoding. *Allerton Conference on Control, Communication and Computing,* Urbana-Champaign, IL. (Invited paper).

16. M. J. Wainwright and M. I. Jordan (2003). Variational methods in graphical models: The view from the marginal polytope. *Allerton Conference on Control, Communication and Computing,* Urbana-Champaign, IL. (Invited paper).

15. M. J. Wainwright and M. I. Jordan (2003). Semidefinite relaxations for approximate inference on graphs with cycles. *IEEE International Symposium on Information Theory,* Yokohama, Japan.

14. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2003). Tree-reweighted belief propagation algorithms and approximate ML estimation by pseudomoment matching. *Workshop on Artificial Intelligence and Statistics,* Key West, FL.

13. J. Feldman, D. R. Karger and M. J. Wainwright (2003). Using linear programming to decode LDPC codes. *Conference on Information Science and Systems,* Baltimore, MD.

12. L. Chen, M. J. Wainwright, M. Cetin and A. S. Willsky (2003). Multitarget-multisensor data association using the tree-reweighted max-product algorithm. *SPIE Aerosense Conference,* Orlando, FL.

11. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2002). Exact MAP estimates by agreement on (hyper)trees. *Neural Information Processing Systems 15,* Vancouver, Canada. **Oral presentation**.

10. J. Feldman, D. R. Karger and M. J. Wainwright (2002) Linear programming-based decoding of turbo codes and its relation to iterative approaches. *Allerton Conference on Control, Communication, and Computing,* Urbana-Champaign, IL.

9. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2002). MAP estimation via agreement on (hyper)trees: Message-passing and linear programming approaches. *Allerton Conference on Control, Communication, and Computing,* Urbana-Champaign, IL.

8. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2002). Tree-based reparameterization framework for analysis of belief propagation and related algorithms. *IEEE International Symposium on Information Theory,* Lausanne, Switzerland.

7. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2002). A new class of upper bounds on the log partition function. *Uncertainty in Artificial Intelligence,* Edmonton, Canada. (**Best Paper Award**)

6. J. Portilla, V. Strela, E. P. Simoncelli, E.P. and M. J. Wainwright (2001). Adaptive Wiener denoising using a Gaussian scale mixture model in the wavelet domain. *IEEE International Conference on Image Processing,* Thessaloniki, Greece.

5. M. J. Wainwright, T. S. Jaakkola and A. S. Willsky (2001). Tree-based reparameterization for approximate inference on graphs with cycles. *Neural Information Processing Systems 14,* Vancouver, Canada. (**Oral presentation**, **Runner-up Best Student Paper Award**)

4. M. J. Wainwright, E. P. Simoncelli, E.P. and A. S. Willsky, (2000). Random cascades of Gaussian scale mixtures and their use in modeling natural images with application to denoising. *IEEE International Conference on Image Processing,* Vancouver, Canada.

3. M. J. Wainwright, E. Sudderth and A. S. Willsky (2000). Tree-based modeling and estimation of Gaussian processes on graphs with cycles. *Neural Information Processing Systems 13,* Denver, CO.

2. M. J. Wainwright, E. P. Simoncelli and A. S. Willsky (2000). Random cascades of Gaussian scale mixtures on wavelet trees with application to natural images, *Annual Meeting of the SPIE*, San Diego, CA. (Invited paper).

1. M. J. Wainwright and E. P. Simoncelli (1999). Scale mixtures of Gaussians and the statistics of natural images. *Neural Information Processing Systems 12,* Denver, CO.

Distinguished and Plenary Lectures (2016–present)

24. Plenary talk, Hangzhou Meeting, August 2023

23. Plenary talk, Samsung/Korea meeting, July 2023

22. Plenary Talk, Center for Approximation and Mathematical Data Analytics, Inaugural Conference, College Station, Texas May 22–25, 2023. *Variational methods in reinforcement learning*

21. Keynote Lecture, Winter School on *Big Data and Computations*, University of Florida, Gainsville, FL. January 2023. *Statstical challenges in sequential decision-making.*

20. Jeffrey L. Elman Distinguished Lecture, Halicioglu Data Science Institute, University of California, San Diego. *Statistical challenges in sequential decision-making*, San Diego, CA November, 2022.

19. Keynote Lecture, Statistics & Machine Learning in the Big Data Era, *New frontiers in sequential decision-making*, Ann Arbor, MI, October 2022.

18. Keynote Lecture, International Symposium on Non-Parametric Statistics, Cyprus, June 2022. *Non-parametric challenges in reinforcement learning*

17. Special invited lecture, Center for Statistical Science, Tsinghua University, December 2021. *Bridging the gap: Instance-optimal procedures in reinforcement learning.*

16. Keynote Lecture, International Conference on Applied Mathematics, Computing and Applications, Hanoi, Vietnam, December 2019 *Randomized algorithms for big data problems*

15. Keynote Lecture, MINDS Symposium on the Foundations of Data Science, John Hopkins University, November 2019. *From optimization to statistical learning: Two vignettes from the interface*

14. Distinguished Speaker, Global Innovation Forum on Transforming Intelligence, Foundation for Armenian Science and Technology, Yerevan, Armenia, October 2019. *Large-scale machine learning: Interpretability and beyond*

13. Baker-Kingland Invited Lecture, Predictive Inference and its Applications, Iowa State University, *High-dimensional prediction: Some computational challenges*, May 2018.

12. David Blackwell Lecture, Institute of Mathematical Statistics, Joint Statistical Meetings, Baltimore, Maryland, *Information-theoretic methods in statistics: From privacy to optimization*. August 2017

11. Opening Lecture, European Meeting of Statisticians, Helsinki, Finland. *Models for ranking: Statistical and computational issues*, July 2017

10. Plenary Lecture, SIAM Conference on Optimization, Vancouver, Canada, *Statistical and computational perspectives on non-convex optimization*. May 2017.

9. Plenary Lecture, SAMSI, Duke University, Raleigh-Durham, *Statistics meets Optimization: Fast Randomized Algorithms for Big Data*, February 2017.

8. Plenary Lecture, INFORMS Conference on Optimization, Austin, Texas. *Statistics meets Optimization: Fast Randomized Algorithms for Big Data* January 2017.

7. Distinguished Speech, International Conference on Data Science, Fudan University, Shanghai, China, *Statistics meets Optimization: Challenges at the Interface*, December 2016.

6. Plenary Lecture, Heilbronn Annual Conference on Mathematics, University of Bristol, England. *Randomization, concentration, and high-dimensional optimization*, September 2016.

5. Plenary Lecture, Institute of Mathematical Statistics, Young Researchers' Conference, Madison, WI. *Some new phenomena in high-dimensional statistics and optimization*, July 2016

4. David Sprott Distinguished Lecture, Department of Statistics, University of Waterloo, *Some new phenomena in high-dimensional statistics and optimization*, May 2016.

3. Plenary Lecture, Workshop on High-dimensional statistics and convex analysis, Royal Statistical Society, London, England. *Statistics meets Optimization: Fast randomized algorithms for large data sets.* March 2016.

2. Google Distinguished Seminar in Machine Learning, Carnegie Mellon University, *Pairwise comparison models for high-dimensional ranking: Some statistical and computational trade-offs*, March 2016.

1. EECS Distinguished Seminar and CS+X Colloquium, Northwestern University, *Statistics meets Optimization: Fast randomized algorithms for large data sets*, March 2016.

Ph.D. Students

22. Eric Xia, Ph.D., MIT 2024.

21. Reese Pathak, Ph.D., UC Berkeley 2024.

20. Wenlong Mou, Ph.D., UC Berkeley 2023, Assistant Professor, Department of Statistics, University of Toronto.

19. Koulik Khamaru, Ph.D., UC Berkeley 2022, Assistant Professor, Rutgers University, Statistics.

18. Raaz Dwivedi, Ph.D., UC Berkeley 2021, Assistant Professor, Cornell University

17. Ashwin Pananjady, Ph.D. UC Berkeley 2020, Assistant Professor, Georgia Tech, IEOR.

16. Billy Fang, Ph.D. UC Berkeley 2020, Google Research

15. Jianbo Chen, Ph.D. UC Berkeley 2019, Citadel Securities

14. Fanny Yang, Ph.D. UC Berkeley 2018, Assistant Professor, Computer Science, ETH Zurich

13. Yuting Wei, Ph.D. UC Berkeley 2018, Assistant Professor, Wharton School, Univ. Pennsylvania.

12. Nihar Shah, Ph.D. UC Berkeley 2017, Assistant Professor, Department of Machine Learning, Carnegie Mellon University

11. Yuchen Zhang, Ph.D. UC Berkeley 2016, Research Scientist, Microsoft Research

10. Mert Pilanci, Ph.D. UC Berkeley 2016, Assistant Professor, Department of EE, Stanford University

9. Po-Ling Loh, Ph.D. UC Berkeley 2014, Professor, Statistical Laboratory, University of Cambridge, UK

8. John Duchi, Ph.D. UC Berkeley 2014. Associate Professor, Departments of Statistics and EE, Stanford University.

7. Nima Noorshams, Ph.D. UC Berkeley 2013. Research scientist, Facebook.

6. Garvesh Raskutti, Ph.D., UC Berkeley 2012. Associate Professor, Department of Statistics, University of Madison-Wisconsin.

5. Alekh Agarwal, Ph.D., UC Berkeley 2012. Senior Researcher, Microsoft Research, New York.

4. Arash Amini, Ph.D. UC Berkeley 2011. Associate Professor, Department of Statistics, UCLA.

3. Sahand Negahban, Ph.D., UC Berkeley 2011. Associate Professor, Department of Statistics, Yale University.

2. Alex Dimakis, Ph.D., UC Berkeley 2008. Professor, Department of ECE, UT Austin.

1. Xuanlong Nguyen, Ph.D., UC Berkeley 2007. Professor, Department of Statistics, University of Michigan.

Post-doctoral fellows and visiting researchers

18. Yuling Yan, MIT, July 2023—July 2024. Assistant Professor, Univ. Wisconsin-Madison.

17. Ran Chen, MIT, November 2022–July 2024.

16. Yaqi Duan, MIT, August 2022–August 2023. Assistant Professor, Stern School, New York University.

15. Andrea Zanette, UC Berkeley, August 2021—July 2023, Assistant Professor, Carnegie Mellon Unversity.

14. Carrie Wu, UC Berkeley, August 2021—August 2022, Google Research.

13. Cong Ma, June 2020—July 2021, Assistant Professor, Department of Statistics, University of Chicago.

12. Merle Behr, August 2018 – August 2020, Professor for Machine Learning, Faculty of Informatics and Data Science, University of Regensburg, Germany

11. Nhat Ho, August 2017 — July 2020. Assistant Professor, Department of Statistics, UT Austin.

10. Aaditya Ramdas, July 2015 — July 2018. Associate Professor, Department of Statistics, Carnegie Mellon University.

9. Reinhard Heckel, August 2016 — August 2017, Rudolf Moessbauer Assistant Professor, Technical University of Munich

8. Yun Yang, July 2014 — July 2016. Assistant Professor, Department of Statistics, University of Illinois, Urbana-Champaign

7. Mahdi Soltanokatabi, July 2014—August 2015, Assistant Professor, Department of ECE, University of Southern California

6. Sivaraman Balakrishan, July 2013—December 2015, Associate Professor, Department of Statistics, Carnegie Mellon University.

5. Yudong Cheng, July 2013—August 2015, Assistant Professor, Department of Operations Research and Industrial Engineering, Cornell Unviversity,

4. Joseph Bradley, 2013—2014, Databricks Company.

3. Johannes Lederer, 2013, Professor of Mathematical Statistics, Ruhr-Universität Bochum.

2. Pradeep Ravikumar, 2008—2009. Professor, Department of Computer Science, Carnegie Mellon University

1. Prasad Santhanam, 2007—2008. Professor, Department of Electrical and Computer Engineering, University of Hawaii.