

# ARYAN MOKHTARI

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## APPOINTMENTS

<b>Department of Electrical and Computer Engineering, UT Austin</b> Assistant Professor	Austin, TX August 2019 - Present
<b>Laboratory for Information and Decision Systems (LIDS), MIT</b> Postdoctoral Associate <i>Hosts:</i> Prof. Asu Ozdaglar and Prof. Ali Jadbabaie	Cambridge, MA January 2018 - July 2019
<b>Simons Institute for the Theory of Computing, UC Berkeley</b> Research Fellow <i>Program:</i> "Bridging Continuous and Discrete Optimization"	Berkeley, CA August 2017 - December 2017

## EDUCATION

<b>University of Pennsylvania</b> Ph.D. in Electrical & Systems Engineering <i>Advisor:</i> Prof. Alejandro Ribeiro <i>Thesis:</i> "Efficient Methods for Large-Scale Empirical Risk Minimization"	Philadelphia, PA August 2017
<b>University of Pennsylvania (The Wharton School)</b> A.M. in Statistics	Philadelphia, PA August 2017
<b>University of Pennsylvania</b> M.Sc. in Electrical Engineering	Philadelphia, PA May 2014
<b>Sharif University of Technology</b> B.Sc. in Electrical Engineering	Tehran, Iran June 2011

## HONORS and AWARDS

• Junior Faculty Excellence in Teaching Award	2023
• Texas Instruments/Kilby Fellow	2021-present
• Army Research Office (ARO) Early Career Program Award	2021
• Joseph and Rosaline Wolf Best Doctoral Dissertation Award (Awarded by the ESE Department of the University of Pennsylvania)	2018
• Research Fellowship from the Simons Institute at UC Berkeley (Program: "Bridging Continuous and Discrete Optimization")	2017
• Departmental Fellowship, UPenn	2012

## PUBLICATIONS

## Preprints

1. N. Rajaraman, Devvrit, A. Mokhtari, K. Ramchandran. "Greedy Pruning with Group Lasso Provably Generalizes for Matrix Sensing and Neural Networks with Quadratic Activations." 2023. [\[pdf\]](#)
2. Q. Jin, T. Ren, N. Ho, A. Mokhtari. "Statistical and Computational Complexities of BFGS Quasi-Newton Method for Generalized Linear Models." 2022. [\[pdf\]](#)
3. R. Jiang, A. Mokhtari. "Generalized Optimistic Methods for Convex-Concave Saddle Point Problems." 2022. [\[pdf\]](#)
4. I. Tziotis, Z. Shen, R. Pedarsani, H. Hassani, A. Mokhtari. "Straggler-Resilient Personalized Federated Learning," 2022. [\[pdf\]](#)
5. M. Fereydounian, A. Mokhtari, R. Pedarsani, H. Hassani. "Provably Private Distributed Averaging Consensus: An Information-Theoretic Approach." 2022. [\[pdf\]](#)

## Conference Papers

1. R. Jiang, Q. Jin, A. Mokhtari. "Online Learning Guided Curvature Approximation: A Quasi-Newton Method with Global Non-Asymptotic Superlinear Convergence." *Conference on Learning Theory (COLT)*, 2023. [\[pdf\]](#)
2. A. Parulekar, L. Collins, K. Shanmugam, A. Mokhtari, S. Shakkottai. "InfoNCE Loss Provably Learns Cluster-Preserving Representations." *Conference on Learning Theory (COLT)*, 2023. [\[pdf\]](#)
3. R. Jiang, N. Abolfazli, A. Mokhtari, E. Yazdandoost Hamedani. "A Conditional Gradient-based Method for Simple Bilevel Optimization with Convex Lower-level Problem." *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2023. [\[pdf\]](#)
4. P. Hedge, G. de Veciana, A. Mokhtari. "Network Adaptive Federated Learning: Congestion and Lossy Compression." *IEEE International Conference on Computer Communications (INFOCOM)*, 2023. [\[pdf\]](#)
5. L. Collins, H. Hassani, A. Mokhtari, S. Shakkottai. "FedAvg with Fine Tuning: Local Updates Lead to Representation Learning." *Neural Information Processing Systems (NeurIPS)*, 2022. [\[pdf\]](#)
6. L. Collins, A. Mokhtari, S. Oh, S. Shakkottai "MAML and ANIL Provably Learn Representations." *International Conference on Machine Learning (ICML)*, 2022. [\[pdf\]](#)
7. Q. Jin, A. Koppel, K. Rajawat, A. Mokhtari. "Sharpened Quasi-Newton Methods: Faster Superlinear Rate and Larger Local Convergence Neighborhood." *International Conference on Machine Learning (ICML)*, 2022. [\[pdf\]](#)
8. M. Faw\*, I. Tziotis\*, C. Caramanis, A. Mokhtari, S. Shakkottai, R. Ward. "The Power of Adaptivity in SGD: Self-Tuning Step Sizes with Unbounded Gradients and Affine Variance." *Conference on Learning Theory (COLT)*, 2022. [\[pdf\]](#)
9. A. Adibi, A. Mokhtari, and H. Hassani. "Minimax Optimization: The Case of Convex-Submodular," *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022. (Oral presentation: Top 2.6% of the submitted papers) [\[pdf\]](#)
10. M. Ye, R. Jiang, H. Wang, D. Choudhary, X. Du, B. Bhushanam, A. Mokhtari, A. Kejariwal, and Q. Liu. "Future Gradient Descent for Adapting the Temporal Shifting Data Distribution in Online Recommendation System," *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2022.
11. L. Collins, A. Mokhtari, S. Shakkottai, "How Does the Task Landscape Affect MAML Performance?," *Conference on Lifelong Learning Agents*, 2022. [\[pdf\]](#)
12. Q. Jin and A. Mokhtari. "Exploiting Local Convergence of Quasi-Newton Methods Globally: Adaptive Sample Size Approach," *Neural Information Processing Systems (NeurIPS)*, 2021. [\[pdf\]](#)
13. A. Fallah, A. Mokhtari, and A. Ozdaglar. "Generalization of Model-Agnostic Meta-Learning Algorithms: Re-

- curing and Unseen Tasks,” *Neural Information Processing Systems (NeurIPS)*, 2021. [[pdf](#)]
14. A. Fallah, K. Georgiev, A. Mokhtari, and A. Ozdaglar. “Provably Convergent Policy Gradient Methods for Model-Agnostic Meta-Reinforcement Learning,” *Neural Information Processing Systems (NeurIPS)*, 2021. [[pdf](#)]
  15. L. Collins, H. Hassani, A. Mokhtari, S. Shakkottai, “Exploiting Shared Representations for Personalized Federated Learning,” *International Conference on Machine Learning (ICML)*, 2021. [[pdf](#)]
  16. F. Haddadpour, M. M. Kamani, A. Mokhtari, and M. Mahdavi. “Federated Learning with Compression: Unified Analysis and Sharp Guarantees,” *Int. Conf. on Artificial Intelligence and Statistics (AISTATS)*, 2021. [[pdf](#)]
  17. L. Collins, A. Mokhtari, and S. Shakkottai. “Task-Robust Model-Agnostic Meta-Learning,” *Neural Information Processing Systems (NeurIPS)*, 2020. [[pdf](#)]
  18. I. Tziotis, C. Caramanis, and A. Mokhtari. “Second Order Optimality in Decentralized Non-Convex Optimization via Perturbed Gradient Tracking,” *Neural Information Processing Systems (NeurIPS)*, 2020. [[pdf](#)]
  19. A. Fallah, A. Mokhtari, and A. Ozdaglar. “Personalized Federated Learning with Theoretical Guarantees: A Model-Agnostic Meta-Learning Approach,” *Neural Information Processing Systems (NeurIPS)*, 2020. [[pdf](#)]
  20. A. Adibi, A. Mokhtari, and H. Hassani. “Submodular Meta-Learning,” *Neural Information Processing Systems (NeurIPS)*, 2020. [[pdf](#)]
  21. H. Taheri, A. Mokhtari, H. Hassani, R. Pedarsani. “Quantized Decentralized Stochastic Learning over Directed Graphs,” *International Conference on Machine Learning (ICML)*, 2020. [[pdf](#)]
  22. M. Zhang, Z. Shen, A. Mokhtari, H. Hassani, and A. Karbasi. “One Sample Stochastic Frank-Wolfe,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  23. S. Soori, K. Mischenko, A. Mokhtari, M. Dehnavi, and M. Gurbuzbalaban. “DAve-QN: A Distributed Averaged Quasi-Newton Method with Local Superlinear Convergence Rate,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  24. M. Zhang, L. Chen, A. Mokhtari, H. Hassani, and A. Karbasi. “Quantized Frank-Wolfe: Faster Optimization, Lower Communication, and Projection Free,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  25. A. Mokhtari, A. Ozdaglar, and S. Pattathil. “A Unified Analysis of Extra-gradient and Optimistic Gradient Methods for Saddle Point Problems: Proximal Point Approach,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  26. A. Fallah, A. Mokhtari, and A. Ozdaglar. “On the Convergence Theory of Gradient-Based Model-Agnostic Meta-Learning Algorithms,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  27. A. Reiszadeh, A. Mokhtari, H. Hassani, A. Jadbabaie, and R. Pedarsani, “FedPAQ: A Communication-Efficient Federated Learning Method with Periodic Averaging and Quantization,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  28. M. Jahani, X. He, C. Ma, A. Mokhtari, D. Mudigere, A. Ribeiro, M. Takac. “Efficient Distributed Hessian Free Algorithm for Large-scale Empirical Risk Minimization via Accumulating Sample Strategy,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. [[pdf](#)]
  29. H. Hassani, A. Karbasi, A. Mokhtari, Z. Shen. “Stochastic Continuous Greedy ++: When Upper and Lower Bounds Match,” *Neural Information Processing Systems (NeurIPS)*, 2019. [[pdf](#)]
  30. A. Reiszadeh, H. Taheri, A. Mokhtari, H. Hassani, and R. Pedarsani, “Robust and Communication-Efficient Collaborative Learning,” *Neural Information Processing Systems (NeurIPS)*, 2019. [[pdf](#)]
  31. A. Mokhtari, A. Ozdaglar, and A. Jadbabaie, “Efficient Nonconvex Empirical Risk Minimization via Adaptive Sample Size Methods,” *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019. [[pdf](#)]
  32. J. Zhang, C. Uribe, A. Mokhtari, and A. Jadbabaie, “Achieving Acceleration in Distributed Optimization via Direct Discretization of the Heavy-Ball ODE,” *American Control Conference (ACC)*, 2019. [[pdf](#)]

33. A. Mokhtari, A. Ozdaglar, and A. Jadbabaie, "Escaping Saddle Points in Constrained Optimization," *Neural Information Processing Systems (NeurIPS)*, pp. 3533-3643, 2018. (Spotlight: Top 4% of the submitted papers) [[pdf](#)] [[Supplementary Material](#)]
34. J. Zhang, A. Mokhtari, S. Sra, and A. Jadbabaie, "Direct Runge-Kutta Discretization Achieves Acceleration," *Neural Information Processing Systems (NeurIPS)*, pp. 3901-3910, 2018. (Spotlight: Top 4% of the submitted papers) [[pdf](#)] [[Supplementary Material](#)]
35. A. Reisizadeh, A. Mokhtari, H. Hassani, and R. Pedarsani, "Quantized Decentralized Consensus Optimization," *IEEE 57th Conference on Decision and Control (CDC)*, 2018. [[pdf](#)]
36. S. Paternain, A. Mokhtari, and A. Ribeiro, "A Newton Method for Faster Navigation in Cluttered Environments," *IEEE 57th Conference on Decision and Control (CDC)*, 2018. [[pdf](#)]
37. A. Mokhtari, H. Hassani, and A. Karbasi, "Decentralized Submodular Maximization: Bridging Discrete and Continuous Settings", *International Conference on Machine Learning (ICML)*, PMLR 80:3613-3622, 2018. (Long talk) [[pdf](#)] [[Supplementary Material](#)]
38. Z. Shen, A. Mokhtari, H. Qian, P. Zhao, and T. Zhou, "Towards More Efficient Stochastic Decentralized Learning: Faster Convergence and Sparse Communication", *International Conference on Machine Learning (ICML)*, PMLR 80:4631-4640, 2018. [[pdf](#)] [[Supplementary Material](#)]
39. A. Mokhtari, H. Hassani, and A. Karbasi, "Conditional Gradient Method for Stochastic Submodular Maximization: Closing the Gap", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 84:1886-1895, 2018. [[pdf](#)] [[Supplementary Material](#)]
40. M. Eisen, A. Mokhtari, and A. Ribeiro, "Large Scale Empirical Risk Minimization via Truncated Adaptive Newton Method", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 84:1447-1455, 2018. [[pdf](#)] [[Supplementary Material](#)]
41. A. Koppel, A. Mokhtari, and A. Ribeiro, "Parallel Stochastic Successive Convex Approximation Method for Large-Scale Dictionary Learning," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, Calgary, Alberta, Canada, 2018. [[pdf](#)]
42. A. Mokhtari and A. Ribeiro, "First-Order Adaptive Sample Size Methods to Reduce Complexity of Empirical Risk Minimization", *Neural Information Processing Systems (NeurIPS) 2017*, pp. 2057-2065, Long Beach, CA, December 4-9, 2017. [[pdf](#)] [[Supplementary Material](#)]
43. M. Eisen, A. Mokhtari, and A. Ribeiro, "A Primal-Dual Quasi-Newton Method for Consensus Optimization", in *51th Asilomar Conference on Signals, Systems and Computers*, 2017, pp. 298-302. [[pdf](#)]
44. A. Mokhtari, M. Eisen, and A. Ribeiro, "An Incremental Quasi-Newton Method with a Local Superlinear Convergence Rate," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, New Orleans, LA, 2017, pp. 4039-4043. [[pdf](#)]
45. A. Mokhtari, M. Gürbüzbalaban, and A. Ribeiro, "A Double Incremental Aggregated Gradient Method with Linear Convergence Rate for Large-Scale Optimization," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, New Orleans, LA, 2017, pp. 4696-4700. [[pdf](#)]
46. A. Mokhtari, A. Koppel, G. Scutari, and A. Ribeiro, "Large-Scale NonConvex Stochastic Optimization by Doubly Stochastic Successive Convex Approximation," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, New Orleans, LA, 2017, pp. 4701-4705. [[pdf](#)]
47. A. Mokhtari, and A. Ingber, "A Diagonal-Augmented Quasi-Newton Method with Application to Factorization Machines," *Int. Conf. Acoustics Speech Signal Process. (ICASSP)*, New Orleans, LA, 2017, pp. 2671-2675. [[pdf](#)]
48. A. Mokhtari, H. Daneshmand, A. Lucchi, T. Hofmann, and A. Ribeiro, "Adaptive Newton Method for Empirical Risk Minimization to Statistical Accuracy", *Neural Information Processing Systems (NeurIPS) 2016*, pp. 4062-4070, Barcelona, Spain, Dec. 5-10, 2016. [[pdf](#)] [[Supplementary Material](#)]
49. T. Chen, A. Mokhtari, X. Wang, A. Ribeiro, and G. B. Giannakis, "A Data-driven Approach to Stochastic Network Optimization", *2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Washington DC, DC, USA, 2016, pp. 510-514. [[pdf](#)]
50. H. Zhang, W. Shi, A. Mokhtari, A. Ribeiro, and Q. Ling, "Decentralized Constrained Consensus Optimization

- with Primal-Dual Splitting Projection”, *2016 IEEE Global Conf. on Signal and Inform. Process. (GlobalSIP)*, Washington DC, DC, USA, 2016, pp. 565-569. [\[pdf\]](#)
51. M. Eisen, A. Mokhtari, and A. Ribeiro, “An Asynchronous Quasi-Newton Method for Consensus Optimization”, *2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Washington DC, DC, USA, 2016, pp. 570-574. [\[pdf\]](#)
  52. A. Mokhtari, W. Shi, and Qing Ling, “ESOM: Exact Second-Order Method for Consensus Optimization,” *50th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, 2016, pp. 783-787. [\[pdf\]](#)
  53. A. Koppel, A. Mokhtari, and A. Ribeiro, “Doubly Stochastic Algorithms for Large-Scale Optimization,” *50th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, 2016, pp. 1705-1709. [\[pdf\]](#)
  54. A. Mokhtari, S. Shahrampour, A. Jadbabaie, and A. Ribeiro, “Online Optimization in Dynamic Environments: Improved Regret Rates for Strongly Convex Problems”, *IEEE 55th Conf. on Decision and Control (CDC)*, pp. 7195-7201, Las Vegas, NV, 2016. [\[pdf\]](#)
  55. A. Mokhtari, W. Shi, Q. Ling, and A. Ribeiro, “A Decentralized Second-Order Method for Dynamic Optimization”, *IEEE 55th Conf. on Decision and Control (CDC)*, pp. 6036-6043, Las Vegas, NV, 2016. [\[pdf\]](#)
  56. M. Eisen, A. Mokhtari, and A. Ribeiro, “A Decentralized Quasi-Newton Method for Dual Formulations of Consensus Optimization,” *IEEE 55th Conf. on Decision and Control (CDC)*, pp. 1951-1958, Las Vegas, NV, 2016. [\[pdf\]](#)
  57. A. Simonetto, A. Koppel, A. Mokhtari, G. Leus, and A. Ribeiro, “A Quasi-Newton Prediction-Correction Method for Decentralized Dynamic Convex Optimization,” *European Control Conference (ECC)*, pp. 1934-1939, Aalborg, Denmark, 2016. [\[pdf\]](#)
  58. A. Mokhtari, A. Koppel, and A. Ribeiro, “Doubly Random Parallel Stochastic Methods for Large Scale Learning,” *American Control Conference (ACC)*, pp. 4847-4852, 2016. [\[pdf\]](#)
  59. A. Simonetto, A. Mokhtari, A. Koppel, G. Leus, and A. Ribeiro, “A Decentralized Prediction-Correction Method for Networked Time-Varying Convex Optimization,” *IEEE 6th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, pp. 509-512, 2015. [\[pdf\]](#)
  60. A. Mokhtari, W. Shi, Q. Ling, and A. Ribeiro, “Decentralized Quadratically Approximated Alternating Direction Method of Multipliers”, *IEEE Global Conf. on Signal and Inform. Process.*, pp. 795-799, Orlando, FL, Dec. 14-16, 2015. [\[pdf\]](#)
  61. A. Koppel, A. Simonetto, A. Mokhtari, G. Leus, and A. Ribeiro, “Target Tracking with Dynamic Convex Optimization,” *IEEE Global Conf. on Signal and Inform. Process.*, pp. 1210-1214, Orlando, FL, Dec. 14-16, 2015. [\[pdf\]](#)
  62. A. Mokhtari and A. Ribeiro, “Decentralized Double Stochastic Averaging Gradient,” *Asilomar Conference on signals, systems, and computers*, pp. 406-410, 2015. [\[pdf\]](#)
  63. A. Simonetto, A. Koppel, A. Mokhtari, G. Leus, and A. Ribeiro, “Prediction-Correction Methods for Time-Varying Convex Optimization,” *Asilomar Conference on signals, systems, and computers*, pp. 666-670, Pacific Grove, CA, Nov. 8-11, 2015. [\[pdf\]](#)
  64. A. Mokhtari, Q. Ling, and A. Ribeiro, “An Approximate Newton Method for Distributed Optimization,” *Proc. Int. Conf. Acoustics Speech Signal Process.*, pp. 2959-2963, 2015. [\[pdf\]](#)
  65. A. Mokhtari, Q. Ling, and A. Ribeiro, “Network Newton,” *Asilomar Conf. on signals, systems, and computers*, pp. 1621-1625, Pacific Grove, CA, Nov. 2-5, 2014. [\[pdf\]](#)
  66. A. Mokhtari and A. Ribeiro, “A Quasi-Newton Method for Large Scale Support Vector Machines,” *Int. Conf. Acoustics Speech Signal Process.*, pp. 8302-8306, 2014. [\[pdf\]](#)
  67. A. Mokhtari and A. Ribeiro, “Regularized Stochastic BFGS algorithm,” *IEEE Global Conf. on Signal and Inform. Process.*, pp.1109-1112, Austin, TX, Dec, 2013. [\[pdf\]](#)
  68. A. Mokhtari and A. Ribeiro, “A Dual Stochastic DFP Algorithm for Optimal Resource Allocation in Wireless Systems,” *IEEE Workshop on Signal Process. Advances in Wireless Commun. (SPAWC)*, pp. 21-25, Darmstadt, Germany, June 16-19, 2013. [\[pdf\]](#)

## Journal Papers

1. Q. Jin, A. Mokhtari. "Non-asymptotic Superlinear Convergence of Standard Quasi-Newton Methods," *Mathematical Programming (MAPR)*, 2022. [\[pdf\]](#)
2. A. Reisizadeh, I. Tziotis, H. Hassani, A. Mokhtari, R. Pedarsani, "Straggler-Resilient Federated Learning: Leveraging the Interplay Between Statistical Accuracy and System Heterogeneity," *IEEE Journal on Selected Areas in Information Theory (JSAIT)*, 2022. [\[pdf\]](#)
3. A. Mokhtari and A. Ribeiro. "Stochastic Quasi-Newton Methods," *Proceedings of the IEEE*, vol. 108, no. 11, pp. 1906–1922, 2020. [\[pdf\]](#) [survey paper]
4. A. Mokhtari, A. Ozdaglar, and S. Pattathil. "Convergence Rate of  $O(1/k)$  for Optimistic Gradient and Extra-gradient Methods in Smooth Convex-Concave Saddle Point Problems," *SIAM Journal on Optimization*, vol. 30, no. 4, pp. 3230-3251, 2020. [\[pdf\]](#)
5. H. Hassani, A. Karbasi, A. Mokhtari, and Z. Shen. "Stochastic Conditional Gradient++: (Non-)Convex Minimization and Continuous Submodular Maximization," *SIAM Journal on Optimization*, vol. 30, no. 4, pp. 3315-3344, 2020. [\[pdf\]](#)
6. A. Mokhtari, H. Hassani, and A. Karbasi, "Stochastic Conditional Gradient Methods: From Convex Minimization to Submodular Maximization," *Journal of Machine Learning Research (JMLR)*, vol. 21, no. 105, pp. 1-49, 2020. [\[pdf\]](#)
7. A. Mokhtari, A. Koppel, M. Takac, and A. Ribeiro, "A Class of Parallel Doubly Stochastic Algorithms for Large-Scale Learning," *Journal of Machine Learning Research (JMLR)*, vol. 21, no.120, pp.1-51, 2020. [\[pdf\]](#)
8. S. Paternain, A. Mokhtari, and A. Ribeiro, "A Newton-based Method for Nonconvex Optimization with Fast Evasion of Saddle Points," *SIAM Journal on Optimization*, vol. 29, no. 1, pp. 343-368, 2019. [\[pdf\]](#)
9. A. Reisizadeh, A. Mokhtari, H. Hassani, and R. Pedarsani, "An Exact Quantized Decentralized Gradient Descent Algorithm," *IEEE Transactions on Signal Processing*, vol. 67, no. 19, pp. 4934-4947, 2019. [\[pdf\]](#)
10. M. Eisen, A. Mokhtari, and A. Ribeiro. "A Primal-Dual Quasi-Newton Method for Exact Consensus Optimization," *IEEE Transactions on Signal Processing*, vol. 67, no. 23, pp. 5983-5997., 2019. [\[pdf\]](#)
11. A. Mokhtari, M. Eisen, and A. Ribeiro, "IQN: An Incremental Quasi-Newton Method with Local Superlinear Convergence Rate," *SIAM Journal on Optimization*, vol. 28, no. 2, pp. 1670–1698, 2018. [\[pdf\]](#)
12. A. Mokhtari, M. Gürbüzbalaban, and A. Ribeiro, "Surpassing Gradient Descent Provably: A Cyclic Incremental Method with Linear Convergence Rate," *SIAM Journal on Optimization*, vol. 28, no. 2, pp. 1420–1447, 2018. [\[pdf\]](#)
13. A. Simonetto, A. Koppel, A. Mokhtari, G. Leus, and A. Ribeiro, "Decentralized Prediction-Correction Methods for Networked Time-Varying Convex Optimization," *IEEE Transactions on Automatic Control*, vol. 62, no. 11, pp. 5724-5738, Nov. 2017. [\[pdf\]](#)
14. T. Chen, A. Mokhtari, X. Wang, A. Ribeiro, and G. B. Giannakis, "Stochastic Averaging for Constrained Optimization with Application to Online Resource Allocation," *IEEE Transactions on Signal Processing*, vol. 65, no. 12, pp. 3078-3098, June 15, 15 2017. [\[pdf\]](#)
15. M. Eisen, A. Mokhtari, and A. Ribeiro, "Decentralized Quasi-Newton Methods," *IEEE Transactions on Signal Processing*, vol. 65, no. 10, pp. 2613-2628, May15, 15 2017. [\[pdf\]](#)
16. A. Mokhtari, Q. Ling, and A. Ribeiro, "Network Newton Distributed Optimization Methods," *IEEE Transactions on Signal Processing*, vol. 65, no. 1, pp. 146-161, Jan.1, 1 2017. [\[pdf\]](#)
17. A. Mokhtari and A. Ribeiro, "DSA: Decentralized Double Stochastic Averaging Gradient Algorithm," *Journal of Machine Learning Research*, 17(61):1-35, 2016. [\[pdf\]](#)
18. A. Mokhtari, W. Shi, Q. Ling, and A. Ribeiro, "A Decentralized Second-Order Method with Exact Linear Convergence Rate for Consensus Optimization," *IEEE Transactions on Signal and Information Processing over Networks*, vol. 2, no. 4, pp. 507-522, Dec. 2016. [\[pdf\]](#)
19. A. Mokhtari, W. Shi, Q. Ling, and A. Ribeiro, "DQM: Decentralized Quadratically Approximated Alternating

- Direction Method of Multipliers,” *IEEE Transactions on Signal Processing*, vol. 64, no. 19, pp. 5158-5173, Oct. 1, 2016. [\[pdf\]](#)
20. A. Simonetto, A. Mokhtari, A. Koppel, G. Leus, and A. Ribeiro, “A Class of Prediction-Correction Methods for Time-Varying Convex Optimization,” in *IEEE Transactions on Signal Processing*, vol. 64, no. 17, pp. 4576-4591, Sept. 1, 1 2016. [\[pdf\]](#)
  21. A. Mokhtari and A. Ribeiro, “Global Convergence of Online Limited Memory BFGS,” *Journal of Machine Learning Research*, vol. 16, pp. 3151-3181, 2015. [\[pdf\]](#)
  22. A. Mokhtari and A. Ribeiro, “RES: Regularized Stochastic BFGS Algorithm,” *IEEE Trans. Signal Process.*, vol. 62, no. 23, pp. 6089 - 6104, December 2014. [\[pdf\]](#)

## Thesis

1. A. Mokhtari, “Efficient Methods for Large-Scale Empirical Risk Minimization,” Ph.D. Dissertation, University of Pennsylvania, 2017. (**Joseph and Rosaline Wolf Best Doctoral Dissertation Award**). [\[pdf\]](#)

## CURRENT PH.D. STUDENTS

- Liam Collins (Sep. 2019 – present)
  - Summer Intern at Amazon Alexa Group (June-August 2022)
  - Summer Intern at Google FL Group (June-August 2023)
- Isidoros Tziotis (Jan. 2020 – present)
  - Summer Intern at Amazon Alexa Group (June-August 2022)
- Qiujiang Jin (Jan. 2020 – present)
  - Summer Intern at Meta Knowledge Management Group (June-August 2022)
  - Summer Intern at Goldman Sachs (June-August 2023)
- Ruichen Jiang (Sep. 2020 – present)
  - Summer Intern at Amazon (June-August 2023)
- Jincheng Cao (Starting Sep. 2022)
  - Summer Intern at eBay (June-August 2023)

## MAJOR TALKS

- “FedAvg with Fine Tuning: Local Updates Lead to Representation Learning” **2023 ITA Wokshop**, February 2023.
- “FedAvg with Fine Tuning: Local Updates Lead to Representation Learning” **2022 Google Workshop on Federated Learning and Analytics, Google**, November 2022.
- “The Power of Adaptivity in Representation Learning: From Meta-Learning to Federated Learning” **IFML Seminar Series, UT Austin**, November 2022.
- “The Power of Adaptivity in Representation Learning: From Meta-Learning to Federated Learning” **TILOS and OPTML++ Seminar Series, MIT**, October 2022.
- “Representation Learning with Model-Agnostic Meta-Learning (MAML)” **Conference on Advances in Data Science Institute for Applied Mathematics and Computational Science, Texas A&M University**, October 2022.
- “The Power of Adaptivity in Representation Learning: From Meta-Learning to Federated Learning” **Machine Learning Seminar Series, College of Science and Engineering, U. of Minnesota**, October 2022.
- “FedAvg with Fine Tuning: Local Updates Lead to Representation Learning” **NSF AI-EDGE Institute Annual Meeting at The Ohio State University**, September 2022.
- “Representation Learning with Model-Agnostic Meta-Learning (MAML)” **NSF AI-EDGE Institute Annual Meeting at The Ohio State University**, September 2022.

- Information Theory and Applications (ITA) Workshop**, May 2022.  
**6G@UT Kick-off Event**, May 2022.
- “Optimistic High-order Methods for Saddle Point Problems”  
**INFORMS Annual Meeting**, October 2021.  
**SIAM Conference on Optimization (OP21)**, July 2021.
  - “Towards Personalized Federated Learning via Representation Learning and Meta-Learning”  
**Amazon Research**, July 2021  
**NSF-TRIPODS Workshop on Communication Efficient Distributed Optimization**, April 2021.
  - “Exploiting Fast Local Convergence of Second-Order Methods Globally: Adaptive Sample Size Methods”  
**SIAM Conference on Computational Science and Engineering (CSE21)**, March 2021.
  - “Gradient-Based Model-Agnostic Meta-Learning Algorithms”  
**Informis Annual Meeting**, October 2020.
  - “Communication-Efficient Federated Learning with Periodic Averaging and Quantization”  
**Information Theory and Applications (ITA) Workshop**, February 2020.
  - “Understanding the Role of Optimism in Minimax Optimization”  
**Bridging Game Theory and Deep Learning Workshop at NeurIPS**, December 2019.
  - “Decentralized Second-order Methods For Consensus Optimization”  
**Informis Annual Meeting**, October 2019.
  - “Large-scale Optimization for Machine Learning and Data Science”  
**University of Illinois at Urbana-Champaign**, Computer Science Dept., March 2019.  
**Johns Hopkins University**, Mathematical Institute for Data Science (MINDS), March 2019.  
**Georgia Tech**, Schools of Electrical and Computer Eng. & Industrial and Systems Eng., March 2019.  
**University of Washington**, Industrial and Systems Eng. Dept., Feb 2019.  
**Rutgers Business School**, Management Science & Information Systems Dept., Feb 2019.  
**University of Texas at Austin**, Electrical & Computer Engineering Dept., Feb 2019.  
**Rensselaer Polytechnic Inst. (RPI)**, Electrical, Computer, and Systems Engineering Dept., Jan 2019.  
**Purdue University**, Schools of Electrical and Computer Eng. & Industrial Eng., Jan 2019.
  - “Achieving Acceleration via Direct Discretization of Heavy-Ball ODE”  
**Information Theory and Applications (ITA) Workshop**, February 2019.
  - “Escaping Saddle Points in Constrained Optimization”  
**Informis Annual Meeting**, November 2018.
  - “Achieving Acceleration via Direct Discretization of Heavy-Ball ODE”  
**DIMACS workshop on Optimization and Machine Learning**, August 2018.
  - “Surpassing Gradient Descent Provably: A Linearly Convergent Cyclic Incremental Method”  
**Informis Annual Meeting**, October 2017.
  - “Incremental Quasi-Newton Methods with Local Superlinear Convergence Rate”  
**International Conference Acoustics, Speech, and Signal Processing (ICASSP)**, March 2017.
  - “Incremental Quasi-Newton Methods with Local Superlinear Convergence Rate”  
**Information Theory and Applications (ITA) Workshop** (Graduation Day), February 2017.
  - “High-order Methods for Empirical Risk Minimization”  
**Google Tech Talk**, January 2017.
  - “Online Optimization in Dynamic Environments”  
**Conference on Decision and Control (CDC)**, December 2016.
  - “DQM: Decentralized Quadratically Approximated ADMM”  
**Informis Annual Meeting**, November 2016.
  - “ESOM: Exact Second-Order Method for Consensus Optimization”  
**Asilomar Conference on Signals, Systems, and Computers**, November 2016.
  - “Stochastic Quasi-Newton Methods”  
**Yahoo! Tech Talk**, August 2016.
  - “DSA: A Decentralized Stochastic Averaging Method with Linear Convergence Rate”



**INFORMS Optimization Society Conference 2016**, March 2016.

- “Decentralized Quadratically Approximated Alternating Direction Method of Multipliers”  
**IEEE Global Conference on Signal and Information Processing**, December 2015.
- “Decentralized Double Stochastic Averaging Gradient”  
**Asilomar Conference on Signals, Systems, and Computers**, November 2015.
- “Stochastic Quasi-Newton Methods”  
**ESE PhD Colloquia, UPenn**, October 2015.
- “Global Convergence of Stochastic Quasi-Newton Methods”  
**International Symposium on Mathematical Programming (ISMP)**, July 2015.

## PROFESSIONAL SERVICE

- Chair of:
  - Session on Federated Learning at Asilomar Conference on Signals, Systems, and Computers, 2021
  - Session on Federated Learning at INFORMS Annual Meeting, 2020
  - Session on “Optimization for Machine Learning” at INFORMS Annual Meeting, 2018
  - Session on “Large-scale Optimization” at INFORMS Annual Meeting, 2018
  - Session on “Algorithms for Nonconvex Optimization” at INFORMS Optimization Society Conf., 2018
  - Session on “Submodular Maximization” at INFORMS Optimization Society Conf., 2018
  - Session on “Distributed Optimization and Learning” at Asilomar Conference, 2017
- Area Chair (Meta-reviewer) for:
  - Neural Information Processing Systems Conference (NeurIPS 2021, 2022, 2023)
  - International Conference on Machine Learning (ICML 2021, 2022, 2023)
  - International Conference on Artificial Intelligence and Statistics (AISTATS 2021)
  - Conference on Learning Theory (COLT 2023)
- Journal refereeing:
  - SIAM Journal on Optimization (SIOPT)
  - Mathematical Programming Journal
  - Journal of Machine Learning Research (JMLR)
  - IEEE Transactions on Signal Processing (TSP)
  - IEEE Transactions on Automatic Control (TAC)
  - IEEE Transactions on Control of Network Systems (TCNS)
  - IEEE Transactions on Signal and Information Processing over Networks (TSIPN)
  - Journal of Selected Topics in Signal Processing (JSTSP)
  - IEEE Transactions on Network Science and Engineering (TNSE)
  - IEEE Signal Processing Letters (SPL)
- Conference refereeing:
  - Neural Information Processing Systems Conference (NeurIPS 2018, 2019, 2020)
  - International Conference on Machine Learning (ICML 2019, 2020)
  - International Conference on Artificial Intelligence and Statistics (AISTATS 2019, 2020)
  - Annual Symposium on Foundations of Computer Science (FOCS 2022)
  - Conference on Learning Theory (COLT 2020, 2022, 2023)
  - International Conference on Learning Representations (ICLR 2021, 2022)
  - IEEE Int. Conference on Acoustics, Speech, and Signal Processing (ICASSP 2021, 2022, 2023)
  - IEEE Int. Symposium on Information Theory (ISIT 2020, 2021, 2022)
  - IEEE Int. Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2021)

- IEEE Int. Workshop on Machine Learning for Signal Processing (MLSP 2021)
- IEEE American Control Conference (ACC)
- IEEE Conference on Decision and Control (CDC)
- IEEE Conference on Control Technology and Applications (CCTA)
- IEEE Global Conference on Signal and Information Processing (GlobalSIP)

## RESEARCH GRANTS

- Qualcomm
  - Title: “Representation Learning and Meta-Learning for Multi-Task Learning”
  - Role: Co-PI
  - Duration: 02/01/2022-02/01/2024
  - Total funding: \$100,000 out of \$200,000
- NSF – National Artificial Intelligence (AI) Research Institute
  - Title: “AI Institute: Symbiotic Foundations for AI and Network Research”
  - Role: Co-PI
  - Duration: 10/01/2021-09/30/2026
  - Total funding: \$600,000 out of \$1,800,000 [Institute budget:  $\approx$  \$20,000,000]
- NSF, Division of Electrical, Communication and Cyber Systems (ECCS)
  - Title: “Collaborative Research: Computationally Efficient Algorithms for Large-scale Bilevel Optimization Problems”
  - Role: PI
  - Duration: 09/15/2021-08/31/2024
  - Total funding: \$224,375 out of \$448,750
- ARO Early Career Program (ECP) Award
  - Title: “Accelerating Adaptivity under Limited Data and Computation: A Meta-Learning Approach”
  - Role: sole-PI
  - Duration: 05/17/2021-05/16/2024
  - Total funding: \$360,000
- Machine Learning Laboratory at UT Austin
  - Title: “Learning to Learn Fast: Theory and Algorithm”
  - Role: sole-PI
  - Duration: 06/01/2021-05/30/2022
  - Total funding: \$50,000
- NSF, Division of Computing and Communication Foundations (CCF)
  - Title: “CIF Small: Computationally Efficient Second-Order Optimization Algorithms for Large-Scale Learning”
  - Role: sole-PI
  - Duration: 07/01/2020-06/30/2024
  - Total funding: \$500,000