

Mehrdad Ghadiri

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- RESEARCH INTERESTS
- ◇ Combinatorial and Convex Optimization
 - ◇ Design and Analysis of Algorithms, Approximation and Randomized Algorithms
 - ◇ Theoretical Machine Learning, Theoretical Aspects of Deep Learning, Tensor Decomposition
 - ◇ Machine Learning, Fairness, Differential Privacy, Data Mining
- EDUCATION
- ◇ [**August 2019 - Present**] Georgia Institute of Technology
Ph.D. in Algorithms, Combinatorics and Optimization / Computer Science.
Advisor: Santosh Vempala.
Minor: Algebraic and Enumerative Combinatorics.
 - ◇ [**September 2017 - September 2019**] University of British Columbia
M.Sc. in Computer Science.
Advisors: Bruce Shepherd and Mark Schmidt.
Thesis title: Beyond Submodular Maximization: One-Sided Smoothness and Meta-Submodularity.
 - ◇ [**September 2011 - September 2016**] Sharif University of Technology
B.Sc. in Information Technology Engineering.
Advisor: Hamid Zarrabi-Zadeh.
Thesis title: Discrete Voronoi Game.
- WORK EXPERIENCE
- ◇ [**May 2021 - Present**] Research intern in Algorithms and Optimization Team at **Google**.
Hosts: Matthew Fahrbach and Thomas Fu.
Working on tensor decomposition methods for deep neural network applications.
- HONORS AND AWARDS
- ◇ **The Machine Learning Center at Georgia Tech (ML@GT) Fellowship.** 2021
 - ◇ **Institute for Data Engineering and Science (IDEaS) and Transdisciplinary Research Institute for Advancing Data Science (TRIAD) Research Scholarship for Ph.D. Students and Postdocs.** 2020
 - ◇ **Borealis AI Global Fellowship Award** 2018
This fellowship is awarded to **only 10 students per year** who pursue graduate degrees (M.Sc. or Ph.D.) at Canadian universities in computer science and related fields with a focus on machine learning or artificial intelligence. I was the **only M.Sc. student** who won this award that year.
 - ◇ **Silver Medal in Iranian National Mathematical Olympiad** 2010
- WORKING PAPERS
- ◇ *Fast Low-Rank Tensor Decomposition by Ridge Leverage Score Sampling*, M. Fahrbach, M. Ghadiri, T. Fu, arXiv preprint arXiv: 2107.10654, 2021.
 - ◇ *A Parameterized Family of Meta-Submodular Functions*, M. Ghadiri, R. Santiago and B. Shepherd, arXiv preprint arXiv: 2006.13754, 2020.
- PUBLICATIONS
- ◇ *Socially Fair k-Means Clustering*, M. Ghadiri, S. Samadi and S. Vempala, in Proceedings of ACM Conference on Fairness, Accountability, and Transparency (**FAccT 2021**), manuscript available on arXiv.
 - ◇ *Beyond Submodular Maximization via One-Sided Smoothness*, M. Ghadiri, R. Santiago and B. Shepherd, in Proceedings of the 32nd Annual ACM-SIAM Symposium on Discrete Algorithms (**SODA 2021**), manuscript available on arXiv.
 - ◇ *Distributed Maximization of Submodular Plus Diversity Functions for Multi-label Feature Selection on Huge Datasets*, M. Ghadiri and M. Schmidt, in Proceedings of the 22nd International Conference on Artificial Intelligence and Statistics (**AISTATS 2019**), manuscript available on AISTATS website.

- ◇ *Scalable Feature Selection via Distributed Diversity Maximization*, M. Ghadiri^{*}, S. Abbasi Zadeh^{*}, V. Mirrokni and M. Zadimoghaddam, in Proceedings of the 31st AAAI Conference on Artificial Intelligence (**AAAI** 2017), manuscript available on AAAI website. (* equal contribution)
[**Oral Presentation**]
 - ◇ *A Multiscale Agent-Based Framework Integrated with a Constraint-Based Metabolic Network Model of Cancer for Simulating Tumor Growth*, M. Ghadiri^{*}, M. Heidari^{*}, S. A. Marashi and S. H. Mousavi, *Molecular BioSystems*, 13(9): 1888-1897, 2017, manuscript available on Royal Society of Chemistry website. (* equal contribution)
 - ◇ *Linear Relaxations for Finding Diverse Elements in Metric Spaces*, A. Bhaskara, M. Ghadiri, V. Mirrokni and O. Svensson, in Proceedings of the 30th Advances in Neural Information Processing Systems (**NeurIPS** 2016), manuscript available on NeurIPS website.
 - ◇ *Minimizing the Total Movement for Movement to Independence Problem on a Line*, M. Ghadiri and S. Yazdanbod, in Proceedings of the 28th Canadian Conference on Computational Geometry (**CCCG** 2016), manuscript available on arXiv.
 - ◇ *Active Distance-Based Clustering using K-medoids*, M. Ghadiri^{*}, A. Aghae^{*} and M. Soleymani Baghshah, in Proceedings of the 20th Pacific-Asian Conference on Knowledge Discovery and Data Mining (**PAKDD** 2016), manuscript available on arXiv. (* equal contribution)
- WORKSHOPS
- ◇ *Amortized rejection sampling in universal probabilistic programming*, S. Naderiparizi, A. Scibior, A. Munk, M. Ghadiri, A. G. Baydin, B. G. Hansen, C. S. de Witt, R. Zinkov, P. Torr, T. Rainforth, Y. W. Teh, F. Wood, **PROBPROG** 2020 manuscript available on arXiv, 2020.
 - ◇ *Efficient Bayesian Inference for Nested Simulators*, B. G. Hansen, C. S. de Witt, R. Zinkov, S. Naderiparizi, A. Scibior, A. Munk, F. Wood, M. Ghadiri, P. Torr, Y. W. Teh, A. G. Baydin, T. Rainforth, 2nd Symposium on Advances in Approximate Bayesian Inference, manuscript available on OpenReview, 2019.
- PRESENTATIONS
- ◇ *Socially Fair k-Means Clustering*, at the 8th Biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), May 2021.
 - ◇ *Beyond Submodular Maximization via One-Sided Smoothness and Meta-Submodularity*, at Google Research, January 2021.
 - ◇ *In Search of Tractable Supermodular Maximization Problems*, at the 7th Biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), Vancouver, B.C., May 2019.
 - ◇ *Beyond Submodular Maximization*, at the Bellairs Workshop on Discrete Optimization, Barbados, April 2019.
 - ◇ *Scalable Feature Selection via Distributed Submodular and Diversity Maximization*, at the Element AI Research Workshop, Vancouver, B.C., August 2018.
- TEACHING ASSISTANTSHIP
- ◇ Georgia Institute of Technology: Computation and the Brain (Graduate Course).
 - ◇ University of British Columbia: Combinatorial Optimization (Graduate Course), Intermediate Algorithm Design and Analysis, Advanced Algorithm Design and Analysis.
 - ◇ Sharif University of Technology: Discrete Structures (3 times), Fundamentals Of Programming, Engineering Probability and Statistics, Signals and Systems, Technical and Scientific Presentation.
- PROFESSIONAL SERVICE
- ◇ Founding member and student/faculty affairs chair of School of Computer Science Graduate Student Association (SCS-GSA) at Georgia Institute of Technology (2021-present).
 - ◇ I have refereed for the following journals: Operations Research Letters, Journal of Combinatorial Optimization, and SIAM Journal on Discrete Mathematics.
 - ◇ I have refereed for the following conferences: NeurIPS 2016, APPROX 2019, NeurIPS 2019, SODA 2020, NeurIPS 2020, AAAI 2021, ICLR 2021, STOC 2021, FORC 2021.
 - ◇ I have co-organized the UBC machine learning reading group in Fall 2018, Spring 2019, and Summer 2019.
- REFERENCES
- ◇ Santosh Vempala (Georgia Institute of Technology)

- ◇ Mohit Singh (Georgia Institute of Technology)
- ◇ Bruce Shepherd (University of British Columbia)
- ◇ Mark Schmidt (University of British Columbia)
- ◇ Vahab Mirrokni (Google)
- ◇ Morteza Zadimoghaddam (Google)