

Meisam Razaviyayn

CONTACT INFORMATION	E-mail: razaviya@usc.edu Phone: (612) 232-6917	Homepage Google scholar profile
APPOINTMENTS	<ul style="list-style-type: none">▷ Google Research (July 2024 – Now), Faculty Visitor▷ Associate Professor (February 2023 – Now) Andrew and Erna Viterbi Early Career Chair Daniel J. Epstein Department of Industrial and Systems Engineering, USC Computer Science Department, USC (Courtesy Appointment) Quantitative And Computational Biology Department (Courtesy Appointment) Electrical and Computer Engineering Department (Courtesy Appointment) USC Machine Learning Center USC Center for Systems and Control Optimization for Data-Driven Science (ODDS) Research Group▷ Associate Director of the USC-Meta Center for Research and Education in AI and Learning (2021 – Now). The center will support AI research and will increase accessibility to AI education.▷ Assistant Professor (August 2016 - February 2023) Daniel J. Epstein Department of Industrial and Systems Engineering, USC Computer Science Department, USC (Courtesy Appointment) Quantitative And Computational Biology Department (Courtesy Appointment) Electrical and Computer Engineering Department (Courtesy Appointment) USC Machine Learning Center USC Center for Systems and Control Optimization for Data-Driven Science (ODDS) Research Group	
PROFESSIONAL PREPARATION	<ul style="list-style-type: none">▷ Postdoctoral Research Fellow, Electrical Engineering Department and Stanford Data Science Institute, Stanford University, 2014–2016▷ Visiting Scientist, Simons Institute for the Theory of Computing, University of California, Berkeley, Spring 2015▷ Ph.D. in Electrical Engineering (Minor in Computer Science), University of Minnesota, 2014▷ M.S. in Electrical Engineering, University of Minnesota, 2013▷ M.S. in Mathematics, University of Minnesota, 2013▷ B.S. in Electrical Engineering, Isfahan University of Technology, 2008	
HONORS AND AWARDS	<ul style="list-style-type: none">▷ National Academy of Engineering, German-American Frontiers of Engineering Symposium Attendee (only 40 engineers from the US was selected by the NAE), 2023▷ Northrop Grumman Excellence in Teaching Award, 2022▷ NSF CAREER Award, March 2022▷ AFOSR Young Investigator Prize Award, November 2021▷ 3M's Non-Tenured Faculty Award (NTFA), February 2021▷ ICCM Best Paper Award in Mathematics, August 2020▷ Best Paper Award in IEEE Data Science Workshop, June 2019▷ Finalist of the Best Paper Prize for Young Researcher in Continuous Optimization, 2016.▷ IEEE Signal Processing Society Young Author Best Paper Award, December 2014.▷ Finalist for Best Paper Prize for Young Researcher in Continuous Optimization, 2013.▷ Doctoral Dissertation Fellowship, University of Minnesota, Twin Cities, 2013.▷ Paper Shortlisted for Best Student Paper Award, SPAWC 2010.▷ Dean's Fellowship, University of Minnesota, 2008–2009.▷ University Scholarship for B.Sc. Programs, Awarded by Isfahan University of Technology, 2004, 2005, 2006, 2007▷ Fifth Place in ACM International Collegiate Programming Contest (ICPC), Asia Regional Contest, Tehran, Iran, 2004▷ Silver Medal Recipient in 20th National Mathematics Olympiad, Iran, 2003.	

Published more than 100 journal and conference publications in various venues including NeurIPS, ICML, ICLR, AISTATS, ALT, CDC, ACC, SIAM J. on Opt., Math Prog., TMLR, IEEE TAC, IEEE TSP, etc; Four patents on optimization algorithms for signal processing; See [Google Scholar Profile](#) and the [OpenReview Profile](#) for a full list of publications. Below is a selected list of publications sorted into two main categories:

Scalable Responsible AI:

Fairness

- S. Baharlouei, S. Patel, and M. Razaviyayn “*f*-FERM: A Scalable Framework for Robust Fair Empirical Risk Minimization,” Twelfth International Conference on Learning Representations, (**ICLR 2024**)
It also appeared in [NeurIPS 2023 Workshop on the Optimization for Machine Learning](#)
- A. Lowy, D. Gupta, and M. Razaviyayn “Stochastic Differentially Private and Fair Learning,” International Conference on Learning Representations (**ICLR 2023**)
It was also selected for **oral presentation** in the [NeurIPS 2022 Workshop on Algorithmic Fairness through the Lens of Causality and Privacy](#)
- A. Lowy, S. Baharlouei, R. Pavan, M. Razaviyayn, and A. Beirami. “FERMI: Fair Empirical Risk Minimization via Exponential Rényi Mutual Information,” Transactions on Machine Learning Research (**TMLR 2022**)
It also appeared in the [ICML Workshop on Socially Responsible Machine Learning](#)
- S. Baharlouei*, M. Nouiehed*, and M. Razaviyayn, “Rényi Fair Inference,” International Conference on Learning Representation (**ICLR 2020**), 2020

Robustness

- S. Baharlouei, K. Ogodu, S.-Z Suen, and M. Razaviyayn. “RIFLE: Robust Inference from Low Order Marginals,” Transactions on Machine Learning Research (**TMLR 2023**).
It was also **selected for oral presentation** in the [ICML 2023 workshop on Duality Principles for Modern Machine Learning](#).
- S. Baharlouei, F. Sheikholeslami, M. Razaviyayn, and Z. Kolter. “Improving Adversarial Robustness via Joint Classification and Multiple Explicit Detection Classes.” The 26th International Conference on Artificial Intelligence and Statistics (**AISTATS 2023**)
Also appeared in the [ICML Workshop on Formal Verification of Machine Learning \(WFVML\)](#)
- T. Huang, S. A Halbe, C. Sankar, P. Amini, S. Kottur, A. Geramifard, M. Razaviyayn, A. Beirami. “Robustness through Data Augmentation Loss Consistency.” Transactions on Machine Learning Research, (**TMLR 2022**)
It also appeared in the [ICML Uncertainty and Robustness in Deep Learning Workshop](#)
- M. Nouiehed, M. Sanjabi, T. Huang, J. D. Lee, and M. Razaviyayn “Solving a Class of Non-Convex Min-Max Games Using Iterative First Order Methods,” Neural Information Processing Systems (**NeurIPS 2019**)
- M. Sanjabi, J. Ba, M. Razaviyayn, M., and J. D. Lee, “On the Convergence and Robustness of Training GANs with Regularized Optimal Transport,” In Advances in Neural Information Processing Systems (**NeurIPS 2018**)
- M. Razaviyayn, F. Farnia, and D. Tse, “Discrete rényi classifiers,” Advances in Neural Information Processing Systems (**NeurIPS 2015**)

Privacy

- X. Zhang, Z. Bu, M. Hong, and M. Razaviyayn, “DOPPLER: Differentially Private Optimizers with Low-pass Filter for Privacy Noise Reduction,” Neural Information Processing Systems, (**NeurIPS 2024**).
- A. Lowy, Z. Li, T. Huang, and M. Razaviyayn, “Optimal Differentially Private Learning with Public Data,” International Conference on Machine Learning, (**ICML 2024**).
It also appeared in [Theory and Practice of Differential Privacy](#), 2023
- J. Flemings, M. Razaviyayn, and M. Annavaram, “Differentially Private Next-Token Prediction of Large Language Models,” In Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Long Papers, (**ICLR 2023**)

- A. Lowy, Z. Li, T. Huang, and M. Razaviyayn, “Optimal Differentially Private Learning with Public Data,” to be submitted, available at arXiv: 2306.15056, 2023.
It also appeared in *Theory and Practice of Differential Privacy*, 2023
- A. Lowy and M. Razaviyayn, “Private Federated Learning Without a Trusted Server: Optimal Algorithms for Convex Losses,” International Conference on Learning Representations (**ICLR 2023**)
It also appeared in *ICML workshop on the Theory and Practice of Differential Privacy*
- A. Lowy, D. Gupta, and M. Razaviyayn “Private Federated Learning Without a Trusted Server: Optimal Algorithms for Convex Losses,” International Conference on Learning Representations (**ICLR 2023**)
It was also selected as an *oral presentation* in the 2022 NeurIPS workshop on Algorithmic Fairness through the Lens of Causality and Privacy (AFCP)
- A. Lowy A. Ghafelebashi, and M. Razaviyayn, “Private non-convex federated learning without a trusted server.” The 26th International Conference on Artificial Intelligence and Statistics (**AISTATS 2023**)
It also appeared in the 2022 *ICML Workshop on Theory and Practice of Differential Privacy*
- A. Lowy and M. Razaviyayn. “Private Stochastic Optimization in the Presence of Outliers: Optimal Rates for (Non-Smooth) Convex Losses and Extension to Non-Convex Losses.” International Conference on Algorithmic Learning Theory (**ALT 2023**)
It also appeared at the NeurIPS 2022 workshop on *Optimization for Machine Learning*

Explainability

- D. Lundstrom, A. Ghafelebashi, and M. Razaviyayn, “Four Axiomatic Characterizations of the Integrated Gradients Attribution Method,” submitted, arXiv:2306.13753
- D. Lundstrom, A. Ghafelebashi, and M. Razaviyayn, “A Unifying Framework to the Analysis of Interaction Methods using Synergy Functions,” International Conference on Machine Learning (**ICML 2023**)
It was also selected as an *oral presentation* in the 2023 *ICML workshop on Interpretable Machine Learning in Healthcare (IMLH)*
- D. Lundstrom, T. Huang, and M. Razaviyayn, “A rigorous study of integrated gradients method and extensions to internal neuron attributions,” International Conference on Machine Learning (**ICML 2022**)

Optimization for Machine Learning:

Distributed Optimization and Federated Learning

- A. Lowy and M. Razaviyayn, “Private Federated Learning Without a Trusted Server: Optimal Algorithms for Convex Losses,” International Conference on Learning Representations (**ICLR 2023**)
- A. Lowy A. Ghafelebashi, and M. Razaviyayn, “Private non-convex federated learning without a trusted server.” The 26th International Conference on Artificial Intelligence and Statistics (**AISTATS 2023**)
- S. Lu, J. D. Lee, M. Razaviyayn, and M. Hong “Linearized ADMM Converges to Second-Order Stationary Points for Non-Convex Problems,” IEEE Transactions on Signal Processing, (**IEEE-TSP 2021**)
- S. Lu, M. Razaviyayn, B. Yang, K. Huang, M. Hong, “SNAP: Finding Approximate Second-Order Stationary Solutions Efficiently for Non-convex Linearly Constrained Problems,” **Spotlight Presentation in NeurIPS 2020** [*spotlight acceptance rate: 3%*]
- M. Hong, J. Lee, M. Razaviyayn, J. D. Lee, “Gradient Primal-Dual Algorithm Converges to Second-Order Stationary Solution for Nonconvex Distributed Optimization Over Networks,” International Conference on Machine Learning (**ICML 2018**)
- Q. Shi, H. Sun, S. Lu, M. Hong, and M. Razaviyayn, “Inexact block coordinate descent methods for symmetric nonnegative matrix factorization,” IEEE Transactions on Signal Processing (**IEEE-TSP 2017**)
- M. Razaviyayn, M. Hong, Z.-Q. Luo, and J.-S. Pang, “A Unified Algorithmic Framework for Block-Structured Optimization Involving Big Data,” IEEE Signal Processing

Magazine, (**IEEE-TSP 2016**)

- M. Hong, Z.-Q. Luo, and M. Razaviyayn “Convergence Analysis of Alternating Direction Method of Multipliers for a Family of Nonconvex Problems”, **SIAM Journal on Optimization**, (**SIOPT 2016**)
- M. Razaviyayn, M. Hong, Z.-Q. Luo, and J.-S. Pang, “Parallel Successive Convex Approximation for Nonsmooth Nonconvex Optimization,” Advances in Neural Information Processing Systems (**NeurIPS 2014**)
- M. Razaviyayn, M. Hong, Z.-Q. Luo “A Unified Convergence Analysis of Block Successive Minimization Methods for Nonsmooth Optimization”, **SIAM Journal on Optimization** (**SIOPT 2013**)

Optimization for Efficient Inference

- T. Huang*, P. Singhanian*, M. Sanjabi, P. Mitra, and M. Razaviyayn, “Alternating Direction Method of Multipliers for Quantization,” International Conference on Artificial Intelligence and Statistics (**AISTATS 2021**)

Min-Max Optimization and Adversarial Learning

- Z. Wang, K. Balasubramanian, S. Ma, and M. Razaviyayn. “Zeroth-Order Algorithms for Stochastic Nonconvex Minimax Problems with Improved Complexities,” **Journal of Global Optimization**, (**JOGO 2023**)
- D. Ostrovskii, B. Barazandeh, and M. Razaviyayn. “Nonconvex-nonconcave min-max optimization with a small maximization domain,” Submitted, arXiv: 2110.03950
- D. Ostrovskii, A. Lowy, and M. Razaviyayn. “Efficient search of first-order Nash equilibria in nonconvex-concave smooth min-max problems,” **SIAM Journal on Optimization**, (**SIOPT 2021**)
- M. Razaviyayn, S. Lu, M. Nouiehed, T. Huang, M. Sanjabi, and M. Hong, “Non-convex Min-Max Optimization: Applications, Challenges, and Recent Theoretical Advances,” **IEEE Signal Processing Magazine**, (**IEEE-TSP 2020**)
- B. Barazandeh*, M. Sanjabi*, and M. Razaviyayn, “Training Generative Adversarial Networks Using Randomly Generated Discriminators,” **IEEE Data Science Workshop [best paper award in IEEE-DSW 2019]**

Landscape Analysis

- Y. Han, M. Razaviyayn, and R. Xu, “Policy Gradient Converges to the Globally Optimal Policy for Nearly Linear-Quadratic Regulators,” submitted, arXiv:2303.08431, 2023.
- M. Nouiehed and Meisam Razaviyayn. “Learning deep models: Critical points and local openness.” **INFORMS Journal on Optimization**, 2022.
- M. Nouiehed* and M. Razaviyayn, “Learning Deep Models: Critical Points and Local Openness,” **International Conference on Learning Representations (ICLR 2018)**

SYNERGISTIC
ACTIVITIES &
SERVICE

- ▷ **Associate Director of the USC-Meta Center for Research and Education in AI and Learning (2022-2023):** Led 10+ research projects of the center; Co-organized three research workshops/meetings with the participation of the USC and Meta researchers; offered 15+ top-off fellowships to incoming PhD students at the ISE and ECE departments; offered 10+ fellowships (fully covering tuition costs) to the incoming Masters students in the Viterbi School of Engineering; Funded 8 undergraduate students in the USC SURE program; Funded 10+ high school students in the USC SHINE program.
- ▷ **Conference Chair:** Uncertainty in Artificial Intelligence 2024 (Workshop Chair), International Conference on Continuous Optimization 2025 (Conference Chair)
- ▷ **Organizing Committee:** Conference on Non-convex Statistical Learning 2017, Responsible AI Workshop in ICLR 2021
- ▷ **Area Editor:** The Journal of Optimization Theory and Applications; responsibility: assign the submissions to the associate editors and supervise the decisions (2024-2025)
- ▷ **Associate Editor:** IEEE Transactions on Signal Processing (April 2022-March 2024), **SIAM Journal on Optimization** (January 1, 2025-December 31, 2027)

FUNDED PROJECTS

- ▷ **Area Chair:** The International Conf. on Artificial Intelligence and Statistics (AISTATS 2022, 2023, 2024, 2025); Neural Information Processing Systems (NeurIPS 2021, 2022, 2023, 2024); International Conference on Machine Learning (ICML 2021, 2023), Conference on Uncertainty in Artificial Intelligence (UAI 2023).
- ▷ **NSF Panels Served:** Directorate for Engineering (ENG) in 2018; Directorate for Computer & Information Science & Engineering (CISE) in 2018, 2020, 2021, 2022, 2024
- ▷ **AFOSR Grant Reviewer** for the Math Programming topic, 2021, 2023
- ▷ **Journal and Conference Reviewer:** Reviewer for 30+ top-tier Journals and Conferences in the areas of Optimization and Machine Learning.
- ▷ Funded by **Amazon:** “Differential Private (DP) Foundational Model Pretraining,” PI, Period: 2025–2026; Funding amount: \$60,000.
- ▷ Funded by **USC Office of Research and Innovation, Generative AI Research Program:** “Making Generative AI Accessible: Efficient Training and Fine-Tuning with Resource-Aware Algorithms,” PI, Period: 2025–2026; Funding amount: \$49,958.
- ▷ Funded by **NSF:** “International Conference on Continuous Optimization,” PI, Period: 2025–2025; Funding amount: \$16,000.
- ▷ Funded by the **NSF NRT Program:** “NRT-AI: Integrating Artificial Intelligence and Operations Research Technologies,” Co-PI, Period: 2024–2029; Funding amount: \$2,940,542.
- ▷ Funded by the **NSF CAREER Award Program:** “CAREER: Foundations of Scalable Nonconvex Min-Max Optimization,” Sole-PI, Period: 2022–2026; Funding amount: \$562,241.
- ▷ Funded by **Meta Platforms:** “USC-Meta Center for Research and Education in AI and Learning,” Multi-PI (Responsible for half of the spending), Period: 2022–2026; Gift amount: \$5,000,000.
- ▷ Funded by the **USC’s Zumberge Collaborative Research Planning Award:** “Engineering Accessible Tools for Redesigning Postpartum Care,” Co-PI, Period: 2023–2025; Total funding: \$45,000.
- ▷ Funded by the **Ming Hsieh Institute for Research on Engineering-Medicine for Cancer:** “Integrated Sensors for Accessible and Timely Diagnosis of Gynecological Cancers,” Co-PI, Period: 2024–2025; Total funding: \$150,000.
- ▷ Funded by the **President’s Sustainability Initiative Award:** “Sustaining a Healthy Population Through Early Detection and Frequent Monitoring: A One-Stop Green Fabrication of Versatile Affordable Diagnostics,” Co-PI, Period: 2024–2025; Total funding: \$250,000.
- ▷ Funded by **Pacific Southwest Region 9 University Transportation Center:** “Enhancing Traffic Flow through Private Data Sharing and Incentivizing New Mobility Services,” Lead-PI, Period: 2024–2025; Total funding: \$100,000 (Own share: \$85,433)
- ▷ Funded by the **AFOSR Young Investigator Award Program:** “Finding Higher-order Stationary Points of Nonconvex Optimization Problems in Multi-agent, Uncertain and Adversarial Environments,” Sole-PI, Period: 2022–2024; Funding amount: \$450,000.
- ▷ Funded by **Google Research:** “Private Learning With Public Data: From Theory to Practice and Back,” Sole PI, Period: 2023–2024; Gift amount: \$30,000
- ▷ Funded by **Meta Platforms:** “Privacy Capabilities for User Data in Feature Engineering,” Multi-PIs (Own share 75K), Period: 2023–2024; Gift amount: \$150,000
- ▷ Funded by **3M NTFA Award:** “Robust and Reliable Machine Learning in the Presence of Environmental Uncertainties,” Sole-PI, Period: 2021– 2024; Gift amount: \$45,000
- ▷ Funded by **Amazon:** “Fair Federated Learning With Private Access to Sensitive Features,” Sole-PI, the USC–Amazon Center; Period: 2022–2023; Gift Amount: \$50,000.

- ▷ Funded by the **Zumberge Research Coordination & Team Building (RCTB) Award, USC**: “Redesigning Diagnosis and Treatment of Mental Health Disorders,” Co-PI, Period: 2022-2023; Total funding: \$25,000.
- ▷ Funded by the **NIH**: “Robust Inference in the Presence of Data Heterogeneity and Missing Data in Health Datasets,” Lead PI, Period: 2019-2023; Funding amount \$707,563.
- ▷ Funded by the **National Center for Sustainable Transportation**: “Incentive Systems for New Mobility Services,” Lead-PI, Period: 2021-2021; Total funding amount: \$100,000 (Own share: \$74,765).
- ▷ Funded by the **Provost Strategies Research Award, USC**: “Towards Pandemic Preparedness: Development of Robust Platform Diagnostics for Rapid Point-of-Care Detection of Pathogen,” Co-PI, Period: 2021-2022; Total funding: \$198,000.
- ▷ Funded by the **Seed Funding, Center for Sustainability, USC**: “An Inexpensive Portable Ion Sensing Platform for Sustainable Agriculture and Sustainable Healthcare,” Co-PI, Period: 2020-2021; Total funding: \$39,840.
- ▷ Funded by the **NCST**: “Congestion Reduction via Personalized Incentives” and “Incentive Systems for New Mobility Services,” Sole-PI, Period: 2020 - 2021; Funding amount: \$199,996.
- ▷ Funded by the **National Center for Sustainable Transportation**: “Congestion Reduction via Personalized Incentives,” Lead-PI, Period: 2020-2020; Total funding amount: \$99,996 (Own share: \$74,836).

SELECT (INVITED)
TALKS

- ▷ EPFL CIS Colloquium 2023, ETH Zurich 2023, Chinese University of Hong Kong 2023; German-American FOE National Academy of Engineering Symposium 2023; SIAM-OP Conference, Seattle 2023; Simons Institute, UC Berkeley 2022; Georgia Tech 2022; ICCOPT 2022; UCLA 2022; Oracle Guild Seminar Series 2022; INFORMS meeting 2021; Lehigh University 2021; Spotlight Presentation NeurIPS 2020; University of Illinois at Urbana-Champaign 2020; Northwestern University 2020; UC San Diego 2020; Mathematical Issues in Information Sciences 2019; Princeton University 2019; UC Davis 2019; University of Minnesota 2019; ICCOPT Berlin 2019; Stochastic Programming Trondheim 2019; MIT 2018; California Institute of Technology 2018.