Shaocong Ma | Curriculum Vitae

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Education

❖ **Ph.D. in Electrical and Computer Engineering** 2019–2024
University of Utah

❖ **M.A. in Statistics** 2017–2019
University of California, Santa Barbara

❖ **B.S. in Statistics** 2013–2017
Sichuan University

Academic & Research Experiences

❖ **Postdoctoral Researcher**, University of Maryland, College Park Jun. 2024–present
Advisor: Prof. Heng Huang

- Memory-efficient optimization algorithms for modern Large Language Models (LLMs);
- Robust reinforcement learning (RL) algorithms for financial applications.

❖ **Research Internship**, Lawrence Livermore National Laboratory May 2022–Aug. 2022
Advisor: Dr. Bhavya Kailkhura, Dr. James Diffenderfer

- Graph-based physics-informed neural networks (PINNs) for computational fluid dynamics.

❖ **Research Assistant**, University of Utah Aug. 2019–May 2024
Advisor: Prof. Yi Zhou

- Robust and efficient reinforcement learning (RL) algorithms and stochastic optimization theory.

Publications

[1] Shaocong Ma and Heng Huang. "On the Optimal Construction of Unbiased Gradient Estimators for Zeroth-Order Optimization". In: *Advances in Neural Information Processing Systems (NeurIPS)* (2025). *NeurIPS 2025 Spotlight*.

[2] Shaocong Ma and Heng Huang. "Robust Reinforcement Learning in Finance: Modeling Market Impact with Elliptic Uncertainty Sets". In: *Advances in Neural Information Processing Systems (NeurIPS)* (2025).

[3] Shaocong Ma and Heng Huang. "Revisiting Zeroth-Order Optimization: Minimum-Variance Two-Point Estimators and Directionally Aligned Perturbations". In: *International Conference on Learning Representations (ICLR)* (2025). *ICLR 2025 Spotlight*.

[4] Shaocong Ma, Ziyi Chen, Yi Zhou, and Heng Huang. "Rectified Robust Policy Optimization for Model-Uncertain Constrained Reinforcement Learning without Strong Duality". In: *TMLR* (2025).

[5] Shaocong Ma, James Diffenderfer, Bhavya Kailkhura, et al. "Deep learning of PDE correction and mesh adaption without automatic differentiation". In: *Machine Learning* 114.61 (2025).

[6] Yi Zhou and Shaocong Ma. "Stochastic Optimization Methods for Policy Evaluation in Reinforcement Learning". In: *Foundations and Trends in Optimization* 6.3 (2024), pp. 145–192.

[7] Shaocong Ma, Ziyi Chen, Shaofeng Zou, and Yi Zhou. "Decentralized Robust V-learning for Solving Markov Games with Model Uncertainty". In: *The Journal of Machine Learning Research (JMLR)* (2023).

[8] Ziyi Chen, Shaocong Ma, and Yi Zhou. "Accelerated proximal alternating gradient-descent-ascent for nonconvex minimax machine learning". In: *2022 IEEE International Symposium on Information Theory (ISIT)* (2022), pp. 672–677.

[9] Ziyi Chen, Shaocong Ma, and Yi Zhou. "Finding correlated equilibrium of constrained Markov game: A primal-dual approach". In: *Advances in Neural Information Processing Systems (NeurIPS)* 35 (2022), pp. 25560–25572.

[10] Shaocong Ma, Ziyi Chen, Yi Zhou, Kaiyi Ji, and Yingbin Liang. "Data sampling affects the complexity of online sgd over dependent data". In: *Uncertainty in Artificial Intelligence (UAI)* (2022), pp. 1296–1305.

[11] Ziyi Chen, Shaocong Ma, and Yi Zhou. "Sample efficient stochastic policy extragradient algorithm for zero-sum markov game". In: *International Conference on Learning Representations (ICLR)* (2021).

[12] Shaocong Ma, Ziyi Chen, Yi Zhou, and Shaofeng Zou. "Greedy-GQ with Variance Reduction: Finite-time Analysis and Improved Complexity". In: *International Conference on Learning Representations (ICLR)* (2020).

[13] Shaocong Ma and Yi Zhou. "Understanding the impact of model incoherence on convergence of incremental SGD with random reshuffle". In: *International Conference on Machine Learning (ICML)* (2020), pp. 6565–6574.

[14] Shaocong Ma, Yi Zhou, and Shaofeng Zou. "Variance-reduced off-policy TDC learning: Non-asymptotic convergence analysis". In: *Advances in Neural Information Processing Systems (NeurIPS)* 33 (2020), pp. 14796–14806.

Honors & Awards

- ❖ NeurIPS 2025, Spotlight (top 3% of submissions) 2025
- ❖ ICLR 2025, Spotlight (top 5% of submissions) 2025
- ❖ AISTATS 2025, Best Reviewer Award 2025
- ❖ Graduate 1st Place at University of Utah 2024
- ❖ Invited Monograph Contributor, Now Publishers (Foundations and Trends in Optimization) 2024
- ❖ Invited Participant (fully funded), NSF-Simons MoDL Annual Meeting, Simons Foundation, New York 2023
- ❖ Excellence Scholarship, The College of Mathematics, Sichuan University 2013–2017
- ❖ Second Prize, Chinese Mathematics Competitions for College Students, Sichuan Province Division 2014

Teaching Experiences

- ❖ **Teaching Assistant**, University of Utah 2020–2021
  - ECE 3500: Fundamentals of Signals and Systems
- ❖ **Teaching Assistant**, University of California, Santa Barbara 2018–2019
  - PSTAT 5A: Statistics; PSTAT 5LS: Statistics for Life Science; PSTAT 109: Statistics for Economics;
  - PSTAT 172A: Actuarial Statistics; PSTAT 175: Survival Analysis

Professional Services

- ❖ **Conference Reviewer**: ICML; ICLR; NeurIPS; IEEE BigData; IJCAI; UAI; AAAI; AISTATS; RLC.
- ❖ **Journal Reviewer**: Transactions on Machine Learning Research (TMLR); IEEE Transactions on Signal Processing (TSP); IEEE Transactions on Networking (ToN); IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI); Scientific Reports; Numerical Algorithms; Nonlinear Dynamics; European Journal of Control.
- ❖ **Workshop Reviewer**: ICLR Blogpost.