Shaocong **Ma**

Ph.D. Candidate · Electrical & Computer Engineering

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Education

University of Utah — *Salt Lake City, Utah*

Ph.D. in Electrical & Computer Engineering — *Aug. 2019 - Jun. 2023*

- Reviewer/Program Committee: NeurIPS'21. ICML'21. BigData'21.
- Teaching experiences: Fundamentals of Signals and Systems.

University of California, Santa Barbara — *Santa Barbara, California*

M.A. in Statistics — *Sep. 2017 - July. 2019*

- Teaching experiences: Statistics for Economics; Survival Analysis; Actuarial Statistics.

Sichuan University — *Chengdu, China*

B.S. in Statistics — *Sep. 2013 - July. 2017*

- Recieved scholarships in 2014, 2015, and 2016.

Publications

Greedy-GQ with Variance Reduction: Finite-time Analysis and Improved Complexity — *ICLR. 2021.*

Shaocong Ma, Ziyi Chen, Yi Zhou, Shaofeng Zou — *Acceptance rate: 28.7%*

- Designed a faster and stable RL algorithm outperforming all existing gradient-based optimal control algorithms.
- Verified theoretical results with OpenAI *gym* environment using large-scale parallel framework.

Variance-Reduced Off-Policy TDC Learning: Non-Asymptotic Convergence Analysis — *NeurIPS. 2020.*

Shaocong Ma, Yi Zhou, Shaofeng Zou — *Acceptance rate: 20.1%*

- Designed a high-performance algorithm beating all SOTA policy evaluation algorithms.
- Implemented a multi-cores accelerating Reinforcement Learning framework, *GARNET* environment.

Understanding the Impact of Model Incoherence on Convergence of Incremental SGD with Random Reshuffle — *ICML. 2020.*

Shaocong Ma, Yi Zhou — *Acceptance rate: 21.8%*

- Theoritically explained how the order of data influences the training procedure.

Projects

MiniFpsGame: A *gym*-Compatible FPS Game Environment — *GitHub.com/minifpsgame*

Open-source software

- Developed a minimalistic 3D FPS game based on Pyglet (OpenGL 3D graphics).
- Built multiple human-level agents trained with D3QN and PPO as the environment benchmark.

Medical Dataset Analysis: EEG-based Epilepsy Seizure Detection and Prediction

ML Course Project (2020 Fall)

- Few-shot learning on highly unbalanced dataset (CHB-MIT Scalp EEG Database).
- Achieved 97.02% accuracy with 56.00% sensitivity.

How to Improve Sample Complexity of SGD over Highly Dependent Data?

Submitted to ICLR 2022

- Theoretically explained the role of data correlation in optimization.
- Designed an elegant and efficient optimization method for highly-correlated dataset.

Skills

Programming Python (including Tensorflow, Pytorch, OpenAI Gym etc.), OpenGL, SQL, MATLAB, R

Software Linux, Microsoft Office, Blender, SAS