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*

- Serve as the reviwer for NeurIPS 2021.
- 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%*

- Overcame the sample-inefficiency caused by the instability of RL algorithm .

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

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

- Implemented a multi-cores accerlated Reinforcement Learning framework, GARNET environment.
- Designed a high-performance policy evaluation algorithm which outperforms the standard TD algorithm.

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).
- Designed all game elements in this game, including the action mode, the game logic, the map, and the reward structure.
- Implemented the built-in 2D and 3D bounding boxes extractor.
- Built multiple human-level agents trained with D3QN and PPO as the environment benchmark.

Agent-Based Object Detection: Construct Trustful Labels without Human-Supervision

In-progress paper

- Designed a novel RL environment where the agent can learn to label 2D bounding boxes without any external information.
- Achieved competitive MMPs compared with human-labeled dataset (using Faster R-CNN and YOLO V3).

Rethink the Correlated Data: Stochastic Approximation with Semimartingale Noises

In-progress paper

- Proposed a semimartingale perspective to resolve the data correlation caused by data sampling.
- Combined the Çinlar characterization and Bichteler–Dellacherie decomposition to model the noise controlled by the sampling process.

Skills

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

Software Linux, Microsoft Office, Blender, SAS