SHENAO ZHANG

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EDUCATION

Northwestern University *Sep. 2023 - Present*
Ph.D. student in IEMS (Industrial Engineering & Management Sciences) *Evanston, IL*
Advisor: Prof. Zhaoran Wang

Georgia Institute of Technology *May 2020 - May. 2022*
M.S. in ECE (Electrical and Computer Engineering), GPA: 3.81/4.00 *Atlanta, GA*
Advisor: Prof. Tuo Zhao and Prof. Bo Dai

South China University of Technology *Aug. 2016 - May 2020*
B.Eng. in EE (Electronic and Information Engineering, Innovation Class) *Guangzhou, China*

University of California, Berkeley *Jan. 2019 - May 2019*
Visiting student at the Department of EECS, GPA: 3.90/4.00 *Berkeley, CA*

RESEARCH INTERESTS

My research centers around Large Language Models (LLMs) and Reinforcement Learning (RL). I'm interested in developing autonomous agents and data-efficient decision-making algorithms/models with applications to robotic and multi-agent systems.

PREPRINTS

[1] Zhihan Liu*, Hao Hu*, **Shenao Zhang***, Hongyi Guo, Shuqi Ke, Boyi Liu, Zhaoran Wang, "Reason for Future, Act for Now: A Principled Framework for Autonomous LLM Agents with Provable Sample Efficiency", *Under Review*. [PDF]

[2] Xiaoyu Chen, **Shenao Zhang**, Pushi Zhang, Li Zhao, Jianyu Chen, "Asking Before Action: Gather Information in Embodied Decision Making with Language Models", *Under Review*. [PDF]

PROCEEDINGS

[3] **Shenao Zhang**, Boyi Liu, Zhaoran Wang†, Tuo Zhao†, "Model-Based Reparameterization Policy Gradient: Theory and Practical Algorithms", *Neural Information Processing Systems (NeurIPS)*, 2023.

[4] Zhihan Liu*, Miao Lu*, Wei Xiong*, Han Zhong, Hao Hu, **Shenao Zhang**, Sirui Zheng, Zhuoran Yang, Zhaoran Wang, "Maximize to Explore: One Objective Function Fusing Estimation, Planning, and Exploration", *Neural Information Processing Systems (NeurIPS)* (Spotlight), 2023. [PDF].

[5] **Shenao Zhang**, Wanxin Jin, Zhaoran Wang, "Adaptive Barrier Smoothing for First-Order Policy Gradient with Contact Dynamics", *International Conference on Machine Learning (ICML)*, 2023. [PDF]

[6] **Shenao Zhang**, "Conservative Dual Policy Optimization for Efficient Model-Based Reinforcement Learning", *Neural Information Processing Systems (NeurIPS)*, 2022. [PDF].

[7] **Shenao Zhang**, Li Shen, Lei Han, Li Shen, "Learning Meta Representation for Agents in Multi-Agent Reinforcement Learning", *Conference on Lifelong Learning Agents (CoLLAs)* (Oral), 2023. [PDF]

[8] **Shenao Zhang**, Li Shen, Zhifeng Li, Wei Liu, "Structure-Regularized Attention for Deformable Object Representation", *NeurIPS Workshop on Object Representations for Learning and Reasoning*, 2020. [PDF]

[9] Dazheng Hu, Huabiao Qin, Hongmei Liu, **Shenao Zhang**, "Gaze Tracking Algorithm Based on Projective Mapping Correction and Gaze Point Compensation in Natural Light", *International Conference on Control and Automation (ICCA)*, 2019. [PDF]

RESEARCH EXPERIENCES

Northwestern University *Aug. 2022 - Present*
Research Intern *Advisor: Zhaoran Wang*
- Currently working on Large Language Models (LLMs) [1].
- Worked on model-based Reinforcement Learning (RL) [4], [5].

ByteDance AML *June 2023 - Aug. 2023*
Research Intern *Advisor: Yingxiang Yang*
- Worked on LLM for planning in Data-AML.

Microsoft Research (MSR), Asia *Feb. 2023 - May 2023*
Research Intern *Advisor: Li Zhao*
- Worked on autonomous LLM agents [2].

Georgia Tech *Sep. 2020 - Aug. 2022*
Research Intern *Advisors: Tuo Zhao*
- Worked on the theory and practical algorithms of model-based reparameterization policy gradient [3].
- Proposed a conservative dual policy optimization algorithm for efficient model-based RL [6].

Tencent AI Lab *Aug. 2019 - Sep. 2020*
Research Intern *Advisors: Li Shen, Lei Han and Li Shen*
- Worked on the representations and generalizability of multi-agent RL algorithms [7].
- Proposed an attention mechanism for visual representation of structured data [8].

South China University of Technology *May 2018 - Dec. 2018*
Undergraduate Researcher *Advisor: Huabiao Qin*
- Worked on the gaze tracking algorithms in natural light [9].

TEACHING EXPERIENCE

Head TA of the graduate course CS 7648: Interactive Robot Learning (Fall 2021) at Georgia Tech.

SELECTED PROJECTS

Object Detection *May 2019 - Oct. 2019*
Project paper: Coarse-to-Fine Attention, advised by Bo Wu. Related patent. *Columbia University*

Cloth Simulation using OpenGL Shader *Jan. 2019 - May 2019*
Project website: ffjmmm.github.io/CS184-final/webpage, advised by Ren Ng. *UC Berkeley*

PROFESSIONAL SERVICE

Conference Review: NeurIPS 2020-23, ICLR 2022-24, AISTATS 2022-24, RSS 2021, ICML 2022-23.
Journal Review: Neurocomputing, Transactions on Pattern Analysis and Machine Intelligence (TPAMI).

HONORS AND AWARDS

NeurIPS Scholar Award *2022-2023*
ICML Travel Award *2023*
Georgia Tech Level A Premier Merit-Based Scholarship *2020-2021*
SCUT Study Abroad Global Education Scholarship *2019*
Second Prize in the China Undergraduate Electronics Design Contest *2018*
Third Prize in the Intel Undergraduate Embedded System Contest *2018*
Outstanding Freshman Scholarship (Awarded to 30 among 6,500 students) *2016*