

# SHENAO ZHANG

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## EDUCATION

### Northwestern University

Ph.D. student in IEMS (Industrial Engineering & Management Sciences)

Advisor: Prof. Zhaoran Wang

Sep. 2023 - Present

Evanston, IL

### Georgia Institute of Technology

M.S. in ECE (Electrical and Computer Engineering), GPA: 3.81/4.00

Advisor: Prof. Tuo Zhao and Prof. Bo Dai

May 2020 - May. 2022

Atlanta, GA

### South China University of Technology

B.Eng. in EE (Electronic and Information Engineering, Innovation Class)

Aug. 2016 - May 2020

Guangzhou, China

### University of California, Berkeley

Visiting student at the Department of EECS, GPA: 3.90/4.00

Jan. 2019 - May 2019

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

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### Northwestern University

Research Intern

Aug. 2022 - Present

Advisor: Zhaoran Wang

- Currently working on Large Language Models (LLMs) [1].
- Worked on model-based Reinforcement Learning (RL) [4], [5].

### ByteDance AML

Research Intern

June 2023 - Aug. 2023

Advisor: Yingxiang Yang

- Worked on LLM for planning in Data-AML.

### Microsoft Research (MSR), Asia

Research Intern

Feb. 2023 - May 2023

Advisor: Li Zhao

- Worked on autonomous LLM agents [2].

### Georgia Tech

Research Intern

Sep. 2020 - Aug. 2022

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

Research Intern

Aug. 2019 - Sep. 2020

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

Undergraduate Researcher

May 2018 - Dec. 2018

Advisor: Huabiao Qin

- Worked on the gaze tracking algorithms in natural light [9].

## TEACHING EXPERIENCE

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

## SELECTED PROJECTS

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### Object Detection

[Project paper](#): Coarse-to-Fine Attention, advised by Bo Wu. [Related patent](#).

May 2019 - Oct. 2019

Columbia University

### Cloth Simulation using OpenGL Shader

[Project website](#): [ffjmmm.github.io/CS184-final/webpage](https://ffjmmm.github.io/CS184-final/webpage), advised by Ren Ng.

Jan. 2019 - May 2019

UC Berkeley

## PROFESSIONAL SERVICE

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**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

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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