

# 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 currently interested in aligning LLMs with RLHF, studying active synthetic data generation and reward overoptimization. Previously, I built autonomous LLM agents and developed data-efficient decision-making algorithms with applications to robotic and multi-agent systems.

## PREPRINTS

[12] **Shenao Zhang**, Donghan Yu, Hiteshi Sharma, Ziyi Yang, Shuohang Wang, Hany Hassan, Zhaoran Wang, "Self-Exploring Language Models: Active Preference Elicitation for Online Alignment", *Preprint*. [\[PDF\]](#)

[11] Zhihan Liu\*, Miao Lu\*, **Shenao Zhang**, Boyi Liu, Hongyi Guo, Yingxiang Yang, Jose Blanchet, Zhaoran Wang, "Provably Mitigating Overoptimization in RLHF: Your SFT Loss is Implicitly an Adversarial Regularizer", *Preprint*. [\[PDF\]](#)

[10] **Shenao Zhang\***, Sirui Zheng\*, Shuqi Ke, Zhihan Liu, Wanxin Jin, Jianbo Yuan, Yingxiang Yang, Hongxia Yang, Zhaoran Wang, "How Can LLM Guide RL? A Value-Based Approach", *Preprint*. [\[PDF\]](#)

[9] Xiaoyu Chen, **Shenao Zhang**, Pushi Zhang, Li Zhao, Jianyu Chen, "Asking Before Action: Gather Information in Embodied Decision Making with Language Models", *Preprint*. [\[PDF\]](#)

## PROCEEDINGS

[8] 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", *International Conference on Machine Learning (ICML)*, 2024. [\[PDF\]](#)

[7] Feng Gao\*, Liangzhi Shi\*, **Shenao Zhang**, Zhaoran Wang, Yi Wu, "Adaptive-Gradient Policy Optimization: Enhancing Policy Learning in Non-Smooth Differentiable Simulations", *International Conference on Machine Learning (ICML)*, 2024. [\[PDF\]](#)

[6] **Shenao Zhang**, Boyi Liu, Zhaoran Wang<sup>†</sup>, Tuo Zhao<sup>†</sup>, "Model-Based Reparameterization Policy Gradient: Theory and Practical Algorithms", *Neural Information Processing Systems (NeurIPS)*, 2023. [\[PDF\]](#).

[5] 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. [\[PDF\]](#).

- [4] **Shenao Zhang**, Wanxin Jin, Zhaoran Wang, “Adaptive Barrier Smoothing for First-Order Policy Gradient with Contact Dynamics”, *International Conference on Machine Learning (ICML)*, 2023. [\[PDF\]](#)
- [3] **Shenao Zhang**, “Conservative Dual Policy Optimization for Efficient Model-Based Reinforcement Learning”, *Neural Information Processing Systems (NeurIPS)*, 2022. [\[PDF\]](#).
- [2] **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. [\[PDF\]](#)
- [1] **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. [\[PDF\]](#)

## INTERNSHIP EXPERIENCE

<b>Microsoft GenAI</b> <i>Student Researcher</i>	<i>Jan. 2024 - June 2024</i> <i>Advisor: Donghan Yu</i>
• Worked on active preference elicitation for online alignment <a href="#">[12]</a> .	
<b>ByteDance AML</b> <i>Research Intern</i>	<i>June 2023 - Aug. 2023</i> <i>Advisor: Yingxiang Yang</i>
• Worked on sample-efficient RL with the policy prior provided by LLMs <a href="#">[11]</a> .	
<b>Microsoft Research (MSR), Asia</b> <i>Research Intern</i>	<i>Feb. 2023 - May 2023</i> <i>Advisor: Li Zhao</i>
• Worked on autonomous LLM agents <a href="#">[9]</a> .	
<b>Tencent AI Lab</b> <i>Research Intern</i>	<i>Aug. 2019 - Sep. 2020</i> <i>Advisors: Li Shen, Lei Han and Li Shen</i>
• Worked on the representations and generalizability of multi-agent RL algorithms <a href="#">[2]</a> .	
• Proposed an attention mechanism for visual representation of structured data <a href="#">[1]</a> .	

## TEACHING EXPERIENCE

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

## SELECTED PROJECTS

<b>Object Detection</b> <a href="#">Project paper</a> : Coarse-to-Fine Attention, advised by Bo Wu. <a href="#">Related patent</a> .	<i>May 2019 - Oct. 2019</i> <i>Columbia University</i>
<b>Cloth Simulation using OpenGL Shader</b> <a href="#">Project website</a> : <a href="https://ffjmmm.github.io/CS184-final/webpage">ffjmmm.github.io/CS184-final/webpage</a> , advised by Ren Ng.	<i>Jan. 2019 - May 2019</i> <i>UC Berkeley</i>

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