# 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 currently interested in the *efficient* alignment of LLMs with RLHF, studying active synthetic data generation and more capable training algorithms. 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", *ICML 2024 AutoRL Workshop* (Best Paper Award). [PDF]

[11] **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]

[10] 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

[9] 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", *Neural Information Processing Systems (NeurIPS)*, 2024. [PDF]

[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[†], Tuo Zhao[†], "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

**Microsoft GenAI** — *Jan. 2024 - June 2024*
*Student Researcher* — *Advisor: Donghan Yu*
· Worked on active preference elicitation for online alignment [12].

**ByteDance AML** — *June 2024 - Present,*
*Research Intern* — *June 2023 - Aug. 2023*
· Worked on sample-efficient RL with the policy prior provided by LLMs [11]. — *Advisor: Yingxiang Yang*

**Microsoft Research (MSR), Asia** — *Feb. 2023 - May 2023*
*Research Intern* — *Advisor: Li Zhao*
· Worked on autonomous LLM agents [9].

**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 [2].
· Proposed an attention mechanism for visual representation of structured data [1].

## 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

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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* |