Hao Hu

30 Shuangqing Road, MMW Building S219, Beijing, China
huh22@mails.tsinghua.edu.cn mousehu.github.io/
https://scholar.google.com/citations?user=mhDH3VYAAAAJ

Education

Tsinghua University *Sept. 2019 - Present*
Ph.D. Candidate in Computer Science, IIIS
Advisor: Prof. Chongjie Zhang and Prof. Yang Gao

Peking University *Sept. 2015 - July 2019*
B.S. in Theoretical and Applied Mechanics, School of Engineering
Double Major in Computer Science

Research Experience

NURL Group, IEMS, Northwestern University *Apr. 2023 - Sept. 2023*
Worked on reinforcement learning theory and reinforcement learning with large language models
Advisor: Prof. Zhaoran Wang

Machine Intelligence Group, IIIS, Tsinghua University *Sept. 2019 - Present*
Working on episodic memory, offline reinforcement learning, semi-supervised reinforcement learning
Advisor: Prof. Chongjie Zhang and Prof. Yang Gao

Vision and Media Computing Group, Peking University *Nov. 2017 - Jun. 2018*
Worked on semantic segmentation and autonomous driving
Advisor: Prof. Shiliang Zhang

Publications And Pre-Prints

(* indicates equal contribution)

1. **Reason for Future, Act for Now: A Principled Architecture for Autonomous LLM Agents** [Paper] [Code] [Blog]

   Zhihan Liu*, **Hao Hu***, Shenao Zhang*, Hongyi Guo, Shuqi Ke, Boyi Liu, Zhaoran Wang

   NeurIPS Workshop on Foundation Models for Decision Making, 2023

2. **Unsupervised Behavior Extraction via Random Intent Priors** [Paper] [Code]

   Hao Hu*, Yiqin Yang*, Jianing Ye, Ziqing Mai, Chongjie Zhang

   Thirty-seventh Conference on Neural Information Processing Systems (**NeurIPS**), 2023

3. **One Objective to Rule Them All: A Maximization Objective Fusing Estimation and Planning for Exploration** [Paper] [Code]

   Zhihan Liu*, Miao Lu*, Wei Xiong*, Han Zhong, **Hao Hu**, Shenao Zhang, Sirui Zheng, Zhuoran Yang, Zhaoran Wang

   Thirty-seventh Conference on Neural Information Processing Systems (**NeurIPS**) **Spotlight**, 2023

4. **What is Essential for Unseen Goal Generalization of Offline Goal-conditioned RL?** [Paper] [Code]

   Ruiyang, Yong Lin, Xiaoteng Ma, **Hao Hu**, Chongjie Zhang, Tong Zhang

   Fortieth International Conference on Machine Learning (**ICML**), 2023

5. **The Provable Benefit of Unsupervised Data Sharing for Offline Reinforcement Learning** [Paper]

   Hao Hu*, Yiqin Yang*, Qianchuan Zhao, Chongjie Zhang

   Eleventh International Conference on Learning Representations (**ICLR**), 2023

6. **Flow to Control: Offline Reinforcement Learning with Lossless Primitive Discovery** [Paper]

   Yiqin Yang*, **Hao Hu***, Xiaoteng Ma*, Wenzhe Li*, Siyuan Li, Chongjie Zhang, Qianchuan Zhao

   Thirty-Seventh AAAI Conference on Artificial Intelligence (**AAAI**), 2023

7. **On the Role of Discount Factor in Offline Reinforcement Learning** [Paper]

   Hao Hu*, Yiqin Yang*, Qianchuan Zhao, Chongjie Zhang

   Thirty-ninth International Conference on Machine Learning (**ICML**), 2022

8. **Offline Reinforcement Learning with Value-based Episodic Memory** [Paper] [Code]

   Xiaoteng Ma*, Yiqin Yang*, **Hao Hu***, Qihan Liu, Jun Yang, Chongjie Zhang, Qianchuan Zhao, Bin Liang

   Tenth International Conference on Learning Representations (**ICLR**), 2022

9. **On the Estimation Bias in Double Q-Learning** [Paper] [Code]

   Zhizhou Ren, Guangxiang Zhu, **Hao Hu**, Beining Han, Jianglun Chen, Chongjie Zhang

   Thirty-fifth Conference on Neural Information Processing Systems (**NeurIPS**), 2021

10. **MetaCURE: Meta Reinforcement Learning with Empowerment-Driven Exploration** [Paper] [Code]

    Jin Zhang*, Jianhao Wang*, **Hao Hu**, Tong Chen, Yingfeng Chen, Changjie Fan, Chongjie Zhang

    Thirty-eighth International Conference on Machine Learning (**ICML**), 2021

11. **Generalizable Episodic Memory for Deep Reinforcement Learning** [Paper] [Code]

    Hao Hu, Jianing Ye, Zhizhou Ren, Guangxiang Zhu, Chongjie Zhang

    Thirty-eighth International Conference on Machine Learning (**ICML**), 2021

12. **Query-Efficient Offline Preference-Based Reinforcement Learning via In-Dataset Exploration** [Paper]

    Hao Hu*, Yiqin Yang*, Shuai Wang, Bo Liu, Yang Gao, Chongjie Zhang

    Under Review

13. **Bayesian Offline-to-Online Reinforcement Learning : A Realist Approach** [Paper]

    Hao Hu*, Yiqin Yang*, Jianing Ye, Ziqing Mai, Yujing Hu, Tangjie Lv, Changjie Fan, Qianchuan Zhao, Chongjie Zhang

    Under Review

14. **Stylized Offline Reinforcement Learning: Extracting Diverse High-Quality Behaviors from Heterogeneous Datasets** [Paper]

    Yihuan Mao, Chengjie Wu, Xi Chen, **Hao Hu**, Ji Jiang, Tianze Zhou, Tangjie Lv, Changjie Fan, Zhipeng Hu, Yi Wu, Yujing Hu, Chongjie Zhang

    Under Review

Honors and Scholarships

Lingjun Pilot Scholarship	2023-2024
Huiyan Elite Scholarship	2022-2023
TOYOTA Scholarship	2021-2022
Second Prize in Zhou Peiyuan Mechanics Competition	May 2017
National Scholarship	2016-2017
Grand Prize in National College Students Physics Competition	Sept. 2016
Award for Academic Excellents	2015-2016

Experience and Services

Engineering Intern *Jun. 2018 - Sept. 2018*
Microsoft STCA, News & Relevance team
Worked on newsletter recommendation

Teaching Assistant
Deep Reinforcement Learning, Spring, 2022 *Feb. 2022 - Jun. 2022*
Artificial Intelligence: Principles and Techniques, Fall, 2021 *Sept. 2021 - Jan. 2022*
Artificial Intelligence: Principles and Techniques, Fall, 2020 *Sept. 2020 - Jan. 2021*

Student Instructor
Theoretical Mechanics, Spring, 2018 *Feb. 2018 - Jun. 2018*

Reviewer
International Conference on Learning Representations (ICLR), 2023
Conference on Neural Information Processing Systems (NeurIPS), 2023
International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023

Selected Talks

- Data-Driven Reinforcement Learning [Slides] *Nov. 2023*
  Bytedance AI Lab
- Unsupervised Behavior Extraction via Random Intent Priors [Slides] *Oct. 2023*
  The 64th RL China Seminar
- On the Role of Discount Factor in Offline Reinforcement Learning [Slides][Video] *Jun. 2022*
  The 21st RL China Seminar
- Generalizable Episodic Memory for Deep Reinforcement Learning [Slides] *Jul. 2021*
  Nanjing University