Tongzhou Mu

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Education

University of California San Diego — San Diego, USA
Ph.D. in Computer Science and Engineering, **Advisor:** Prof. Hao Su — 2019 - Current

University of California San Diego — San Diego, USA
M.S. in Computer Science and Engineering, **GPA:** 4.0/4.0 — 2017 - 2019

Zhejiang University — Hangzhou, China
B.Eng. in Computer Science and Technology, **GPA:** 3.8/4.0, **Major GPA**: 3.97/4.00 — 2013 - 2017

Research Interests

My long-term research goal is to build a **decision-making framework with strong generalizability**. Specifically, I am interested in **Reinforcement Learning / Imitation Learning**, **Concept Discovery and Reasoning**, and **Robotics / Embodied AI**.

Publications

[1] J. Gu, F. Xiang, X. Li, Z. Ling, X. Liu, **T. Mu**, Y. Tang, S. Tao, X. Wei, Y. Yao, X. Yuan, P. Xie, Z. Huang, R. Chen, and H. Su, "Maniskill2: A unified benchmark for generalizable manipulation skills", in *International Conference on Learning Representations (**ICLR**)*, 2023.

[2] N. Hansen, Z. Yuan, Y. Ze, **T. Mu**, A. Rajeswaran, H. Su, H. Xu, and X. Wang, "On pre-training for visuo-motor control: Revisiting a learning-from-scratch baseline", in *International Conference on Machine Learning (**ICML**)*, PMLR, 2023.

[3] S. Tao, X. Li, **T. Mu**, Z. Huang, Y. Qin, and H. Su, "Abstract-to-executable trajectory translation for one-shot task generalization", in *International Conference on Machine Learning (**ICML**)*, PMLR, 2023.

[4] X. Zhang, R. Chen, A. Li, F. Xiang, Y. Qin, J. Gu, Z. Ling, M. Liu, P. Zeng, S. Han, Z. Huang, **T. Mu**, J. Xu, and H. Su, "Close the optical sensing domain gap by physics-grounded active stereo sensor simulation", *IEEE Transactions on Robotics (**T-RO**)*, pp. 1–19, 2023.

[5] **T. Mu**, K. Lin, F. Niu, and G. Thattai, "Learning two-step hybrid policy for graph-based interpretable reinforcement learning", *Transactions on Machine Learning Research (**TMLR**)*, 2022.

[6] **T. Mu**, Z. Ling, F. Xiang, D. C. Yang, X. Li, S. Tao, Z. Huang, Z. Jia, and H. Su, "Maniskill: Generalizable manipulation skill benchmark with large-scale demonstrations", in *Thirty-fifth Conference on Neural Information Processing Systems (**NeurIPS**) Datasets and Benchmarks Track*, 2021.

[7] **T. Mu**, J. Gu, Z. Jia, H. Tang, and H. Su, "Refactoring policy for compositional generalizability using self-supervised object proposals", in *Thirty-fourth Conference on Neural Information Processing Systems (**NeurIPS**)*, 2020.

[8] F. Liu, Z. Ling, **T. Mu**, and H. Su, "State alignment-based imitation learning", in *International Conference on Learning Representations (**ICLR**)*, 2019.

[9] X. Liu, **T. Mu**, and H. Su, "Transfer value or policy? a value-centric framework towards transferrable continuous reinforcement learning", in *Deep Reinforcement Learning Workshop at **NeurIPS***, 2018.

[10] Z. Shen, H. Qian, **T. Mu**, and C. Zhang, "Accelerated doubly stochastic gradient algorithm for large-scale empirical risk minimization.", in *International Joint Conference on Artificial Intelligence (**IJCAI**)*, 2017.

[11] Z. Shen, H. Qian, T. Zhou, and **T. Mu**, "Adaptive variance reducing for stochastic gradient descent.", in *International Joint Conference on Artificial Intelligence (**IJCAI**)*, 2016.

Under Review Submissions & Preprints

1. **Tongzhou Mu**, Minghua Liu, and Hao Su, "Learning Reusable Dense Rewards for Multi-Stage Tasks", Submitted to *Conference on Neural Information Processing Systems (NeurIPS)*, 2023
2. **Tongzhou Mu**, and Hao Su, "Boosting Reinforcement Learning and Planning with Demonstrations: A Survey", ArXiv, 2023

Invited Talks

- **Pre-training Robot Learning Workshop at CoRL 2022** Dec 2022
  Topic: On Pre-Training for Visuo-Motor Control: Revisiting a Learning-from-Scratch Baseline
- **Stanford Vision and Learning Lab** Dec 2021
  Topic: Generalizable Manipulation Skill Benchmark with Large-Scale Demonstrations
- **UC Berkeley Robot Learning Lab** Nov 2021
  Topic: Generalizable Manipulation Skill Benchmark with Large-Scale Demonstrations
- **Qualcomm AI Lab** Mar 2020
  Topic: Task-driven Entity Abstraction from Visual Observations

Industry Experiences

Amazon Alexa AI Sunnyvale, United States
Full-Time Applied Scientist Intern Summer 2021

- Project: Interpretable RL for Text-Based Games with Graph Inputs

Wormpex AI Research Remote, United States
Full-Time Research Intern Summer 2020

- Project: Store Layout Optimization based on Customer Behavior Model

Intel AI San Diego, United States
Full-Time Research Intern Summer 2019

- Project: Memory-Constrained Navigation via Combining RL and Planning

Microsoft Research Asia Beijing, China
Full-Time Research Intern at Visual Computing Group Apr 2017 - Aug 2017

- Project: Indoor Visual Navigation by Deep RL

Professional Services

Academic Event Organizer

- SAPIEN ManiSkill Challenge 2021**(Lead Organizer)**
- ICLR 2022 Workshop "Generalizable Policy Learning in the Physical World" **(Lead Organizer)**

- CVPR 2022 Tutorial "Building and Working in Environments for Embodied AI"

Reviewer

- Conference Reviewer: ICLR, NeurIPS, ICRA, IROS, ICCV, AAAI
- Journal Reviewer: RA-L

Teaching

- **Consultant Volunteer** at UC San Diego — Fall 2020
  CSE291-J00: Deep Learning Lab (Computer Vision)
- **Teaching Assistant** at UC San Diego — Fall 2018
  CSE 152: Introduction to Computer Vision

Awards and Honors

- ACM-ICPC (International Collegiate Programming Contest) Asia Regional Contest **Gold Medal** — 2015
- China Computer Federation Elite Collegiate Award (top 108 in China) — 2016
- Award of Excellence for Stars of Tomorrow Internship Program, Microsoft Research Asia — 2017