Jinghuan Shang

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Education

Stony Brook University, NY, USA **2018 – Present**
Ph.D. Candidate in Computer Science, GPA: 3.98/4, Advisor: Prof. Michael S. Ryoo

Shanghai Jiao Tong University, Shanghai, China **2014 – 2018**
B.S. in Computer Science, IEEE Pilot Class

Research Interest

Visual and sequence representation & foundation models for imitation learning and reinforcement learning.

Selected Publications

1. **Shang**, **J.** & Ryoo, M. S. *Active Reinforcement Learning under Limited Visual Observability* in *Proceedings of Conference on Neural Information Processing Systems (**NeurIPS**)* (2023).
2. Li, X., Belagali, V., **Shang**, **J.** & Ryoo, M. S. Crossway Diffusion: Improving Diffusion-based Visuomotor Policy via Self-supervised Learning. *arXiv preprint.* eprint: 2307.01849 (2023).
3. **Shang**, **J.**, Das, S. & Ryoo, M. S. *Learning Viewpoint-Agnostic Visual Representations by Recovering Tokens in 3D Space* in *Proceedings of Conference on Neural Information Processing Systems (**NeurIPS**)* (2022).
4. Li, X., **Shang**, **J.**, Das, S. & Ryoo, M. S. *Does Self-supervised Learning Really Improve Reinforcement Learning from Pixels?* in *Proceedings of Conference on Neural Information Processing Systems (**NeurIPS**)* (2022).
5. Burgert, R., **Shang**, **J.**, Li, X. & Ryoo, M. S. *Neural Neural Textures Make Sim2Real Consistent* in *Conference on Robot Learning (CoRL)* (2022).
6. **Shang**, **J.**, Li, X., Kahatapitiya, K., Lee, Y.-C. & Ryoo, M. S. StARformer: Transformer with State-Action-Reward Representations for Robot Learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)* (2022).
7. **Shang**, **J.**, Kahatapitiya, K., Li, X. & Ryoo, M. S. *StARformer: Transformer with State-Action-Reward Representations for Visual Reinforcement Learning* in *European Conference on Computer Vision (**ECCV**)* (2022).
8. **Shang**, **J.** & Ryoo, M. S. *Self-Supervised Disentangled Representation Learning for Third-Person Imitation Learning* in *IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)* (2021).

Research Experience

Research Intern, Motional AD Inc **Aug 2022 – Dec 2022**
Trajectory prediction models, benchmarks and datasets

Research Assistant, Stony Brook University **May 2020 – Present**
Visual Representation Learning for Robotics

- **Active Reinforcement Learning** [1]
  - Embodied agent learns to see and act simultaneously through a task in limited observable environments.
- **Viewpoint-agnostic Representation** [3]
  - A learnable, differentiable, and light-weighted plugin for Transformer that learns viewpoint-agnostic representations from monocular 2D image.
- **Imitation Learning for Egocentric Tasks from Third-person Experiences** [8]
  - A disentanglement approach to align first-person view and third-person view experiences for reward assignment that benefits the robot learning from third-person view observations.

Sequence Representation Learning for Robotics

- **Transformer for Robot Learning** [6, 7]
  - StARformer, a decision transformer model with explicit separate local and long-horizon representations for better offline-RL and imitation performance, especially for longer sequences.
- **Diffusion Model for Sequential Behavior Generation** [2]
  - Crossway Diffusion, a diffusion model with a self-supervised branch that enhances imitation learning.

Professional Activities

Conference Reviewer: CVPR'22, ECCV'22, AISTATS'23, ICML'23, ICCV'23, NeurIPS'23, AAAI'24, ICLR'24, ICRA'24
Guest Talk: Google Inc. (2022, Transformer for Robot Learning), CSE527 Introduction to Computer Vision (Fall 2021, graduate level), CSE525 Introduction to Robotics (Spring 2023, 2022, 2021, graduate level)
Teaching Assistant: CSE378 Introduction to Robotics (Fall 2023), CSE548 Analysis of Algorithms (Spring 2019, graduate level), CSE564 Visualization (Spring 2020, graduate level), CSE101 Computer Science Principles (Fall 2018)

Honors and Awards

- NeurIPS 2022 Scholar Award 2022
- Chairman's Fellowship, Stony Brook University 2018-2019
- Outstanding Graduate of Colleges and Universities in Shanghai, China (Top 5%) 2018
- 1st Prize in China Undergraduate Mathematical Contest in Modeling 2017
- Academic Excellence Scholarship of SJTU (Top 20%) 2015, 2016, 2017

Technical Skills

Competitive Programming:[My LeetCode] Ranked 9/54 in SBU ACM ICBC Selection Contest, 2020
Technologies/Frameworks: PyTorch, Linux, Git, Tensorflow, Unity3D
Simulated Environments: Pybullet, MuJoCo, DeepMind Control Suite, Robosuite, Atari_py