Yijie Guo

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Research Interests

My research interest lies in deep reinforcement learning, especially balancing the exploration and exploitation in difficult domains, and representation learning to improve sample efficiency and performance of RL algorithms.

EDUCATION

University of Michigan Ann Arbor, Michigan
Ph.D. in *Computer Science & Engineering* *Sep. 2017 – Present*
Advisor: Honglak Lee

University of Michigan Ann Arbor, Michigan
B.S. in *Honors Mathematics & Data Science,* GPA: 3.9/4.0 *Jul. 2015 – Apr. 2017*

Peking University Beijing, China
Major in *Applied Mathematics,* GPA: 3.75/4.0 *Sep. 2012 – Jun. 2015*

RESEARCH EXPERIENCE

Research Assistant at University of Michigan Ann Arbor, Michigan
Sep. 2017 – Present

- Propose a trajectory-conditioned policy to imitate diverse trajectories from the agent's past experience reinforcement learning problems with sparse reward to help exploration to find the (near)-optimal solution
- Implement self-imitation learning, generative adversarial self-imitation learning, and related baseline models; Conduct experiments on Atari and Mujoco tasks to get better performance against baseline
- Conduct experiments across various image datasets for unsupervised landmark discovery; Implement the regression model for quantitative evaluation and generation model for qualitative evaluation

Research Intern at Google Brain MTV, California
Advisor: Minmin Chen, Honglak Lee *Jun.2019 – Present*

- Improve the policy-based method in batch reinforcement learning problems by constraining the divergence between target policy and behavior policy in a curriculum way

Research Intern at Google Brain MTV, California
Advisor: Honglak Lee, Samy Bengio *Jun.2018 – Aug.2018*

- Build a model to learn representation about controllable and uncontrollable dynamics in RL; Capture the location information of multiple moving entities in the 2D video games to improve count-based exploration
- Augment the agent's past good experience using the learnt representation to help one-shot imitation learning

PUBLICATION

Contingency-Aware Exploration in Reinforcement Learning
Jongwook Choi*, **Yijie Guo***, Marcin Moczulski*, Junhyuk Oh, Neal Wu, Mohammad Norouzi, Honglak Lee
International Conference on Learning Representations(ICLR), 2019

Generative Adversarial Self-Imitation Learning
Junhyuk Oh*, **Yijie Guo***, Satinder Singh, Honglak Lee
In *Advances in Neural Information Processing Systems, Deep Reinforcement Learning Workshop*, 2018

Self-Imitation Learning
Junhyuk Oh*, **Yijie Guo***, Satinder Singh, Honglak Lee
In International Conference on Machine Learning *(ICML)*, 2018.

Unsupervised Discovery of Landmarks as Structural Representations
Yuting Zhang, **Yijie Guo**, Yixin Jin, Yijun Luo, Zhiyuan He, Honglak Lee.
In *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018. **Oral presentation**

Discriminative Bimodal Networks for Visual Localization and Detection with Natural Language Queries
Yuting Zhang, Luyao Yuan, **Yijie Guo**, Zhiyuan He, I-An Huang, Honglak Lee
In *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017. **Spotlight**

Perspective Transformer Nets: Learning Single-View 3D Object Reconstruction without 3D Supervision
Xinchen Yan, Jimei Yang, Ersin Yumer, **Yijie Guo**, Honglak Lee
In *Advances in Neural Information Processing Systems (NeurIPS),* 2016.