Linjie Xu

Homepage: egg-west.github.io
Email: linjie.xu@qmul.ac.uk

EDUCATION

Queen Mary University of London, London, UK   2020-2024 (expected)   PhD Game AI

Nanchang University, Jiangxi, China   2016-2020 B.E. Software Engineering

Graduate Project: Gradient-based Intrinsic Reward for Reinforcement Learning

RESEARCH EXPERIENCE

Offline Reinforcement Learning

Research Intern, Microsoft Research Asia, China   January, 2023 – Present

- Research on the algorithm and applications of offline reinforcement learning.

Abstraction Method for Game Playing

PhD Program, Game AI Group, QMUL, UK   September, 2020 – Present

- For a sequential decision-making problem, the *abstraction* technique firstly extracts a new problem (usually a simpler one) from the original problem. The original problem is solved by solving this generated problem.

- Previous abstraction methods for strategy games rely on human knowledge, and fails on generalizing to other games. Abstraction methods for simpler planning problems generalize well but it finds difficulty to scale up. We designed *Elastic Monte Carlo Tree Search,* a domain-knowledge-free abstraction method that scales to strategy games.

Multi-Agent Learning for Multi-Task Learning

Visiting Research Student, SusTech University, China   September,2019 – September, 2020

- I modelled each task as an agent and use multi-agent reinforcement learning to solve the optimization of supervised multi-task learning problem.

Reinforcement Learning for Robotic Arm Grasping

Visiting Research Student, Westlake University, China   July - September, 2019

- I trained recurrent Q networks to control a physical robotic arm to grasp items.

Voice Assistant R&D for OPPO's Mobile Phone

R&D Intern, Voice Assistant Group, OPPO Corp. China   October – December, 2018

- Together with colleagues, we designed the first-generation voice assistant for OPPO's mobile phones. I was working on Natural Language Understanding that maps text to tasks.

SELECTED PUBLICATIONS

Linjie Xu, Zhengyao Jiang, Jinyu Wang, Lei Song, Jiang Bian. Mildly Constrained Evaluation Policy for Offline Reinforcement Learning. *Arxiv: 2306.03680, 2023*

Linjie Xu, Diego Perez-Liebana, Alexander Dockhorn. Towards Applicable State Abstractions: a Preview in Strategy games. *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM) - RL as Agency workshop, 2022*

Linjie Xu, Alexander Dockhorn, Jorge Hurtado-Grueso, Dominik Jeurissen, and Diego Perez-Liebana. Elastic monte carlo tree search with state abstraction for strategy game playing. *IEEE Conference on Games (CoG), pp. 1–8. IEEE, 2022.*

Linjie Xu and Yihong Chen. A Hierarchical Approach for MARLÖ Challenge. *IEEE Conference on Games (CoG) (pp. 1-4). IEEE, 2019*

TEACHING

Machine Learning at Queen Mary, Demonstrator	Spring 2020, Autumn 2021
Game Artificial Intelligence at Queen Mary, Demonstrator	Autumn 2021

OPENSOURCE CONTRIBUTION

Code Contributor: **pytorch/pytorch**, Microsoft/nni
My Repository: egg-west/AdamW-pytorch got **90 stars** and **19 forks** from the community

SELECTED AWARDS

3rd Place (Solo), 2018 Marlo Challenge
- Training RL agents to finish collaborative tasks in Minecraft. Held by Microsoft Research Cambridge.

Top 20   (5-people Group), 2017 ASC Challenge
- An international supercomputer challenge. I was responsible for GPU programming and Machine Comprehension Problem.

SKILLS

C++, C, CUDA, Python;

Jax, Pytorch, Tensorflow

Robot Operating System (ROS)