Liu, Anji

E-mail: liuanji@cs.ucla.edu   **Phone Number:** +86 13717882105
Address: Engineering VI Room 398, 404 Westwood Plaza, Los Angeles, CA 90095

Education

UCLA, Department of Computer Science   Sep. 2020 – Present
➢   **Ph.D. in Computer Science**

Beihang University, School of Automation Science and Electrical Engineering   Sep. 2015 – Jun. 2019
➢   **Bachelor of Engineering in Automation**
➢   **General GPA:** 3.86/4.00, **Rank:** Top 2/175

Experiences

University of California, Los Angeles (UCLA)   Aug. 2019 – Jul. 2020
➢   **Title:** Visiting Researcher
➢   **Research topic:** Tractable inference on probabilistic graphical models, and its application on reinforcement learning.

Seattle AI Lab, Kwai Inc.   Dec. 2018 – Jul. 2019
➢   **Title:** Machine Learning Intern
➢   **Project:** User pass rate prediction system for a level-oriented mobile game "joy city". The system is powered by a game AI using reinforcement learning (RL) and Monte Carlo tree search (MCTS) that achieves master-level performance in the mobile game.

Papers

[1] **Liu A**, Chen J, Yu M, Zhai Y, Zhou X, Liu J. Watch the Unobserved: A Simple Approach to Parallelizing Monte Carlo Tree Search. In *Eighth International Conference on Learning Representations (ICLR)*, 2020. [pdf]

[2] **Liu A**, Liang Y, Van den broeck G. Off-Policy Deep Reinforcement Learning with Analogous Disentangled Exploration. In *Nineteenth International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*, 2020. [pdf]

[3] **Liu A**, Liang Y, Van den broeck G. Off-Policy Deep Reinforcement Learning with Analogous Disentangled Exploration. In *Thirty-fourth AAAI conference on Artificial Intelligence workshop on Reinforcement Learning for Games (RLG)*, 2020.

[4] **Liu A**, Laili Y. Balance Gate Controlled Deep Neural Network. *Neurocomputing 320: 183-194*, 2018. [pdf]

[5] Vergari A, Choi Y, **Liu A**, Teso S, Van Den Broeck G. A Compositional Atlas of Tractable Circuit Operations: From Simple Transformations to Complex Information-Theoretic Queries.
Status: **submitted to NeurIPS 2021**

[6] **Liu A**, Van den broeck G. Tractable Regularization of Probabilistic Circuits.
Status: **submitted to NeurIPS 2021**

Research Experience

Research on Model-based Reinforcement Learning   Sep. 2019 – Jun. 2020
Statistictical and Relational Artificial Intelligence (StarAI) Lab, UCLA   *Advisor: Guy Van den Broeck*

➢   Solving the environment model's inaccuracy problem in model-based reinforcement learning with tractable probabilistic inference models. The main idea is that by propagating environment model's uncertainty over multiple time steps, we can both improve multi-step prediction and be able to quantify the uncertainty, which allows principled tradeoff between using environment model for planning and using on-policy methods.

Research on Exploration Strategy of Continuous Control Tasks   Jan. 2019 – Aug. 2019

Statistical and Relational Artificial Intelligence (StarAI) lab, UCLA   *Advisor: Guy Van den Broeck*

➢ Disentangled the policy learning and exploration process in continuous control reinforcement learning tasks by separately design two policies that maximize their respective objectives, which offers policy optimality as well as effective exploration. The resultant model outperforms state-of-the-art approaches in various benchmarks [2, 3].

Research on Parallelizing Monte Carlo Tree Search   **Jan. 2019 – Aug. 2019**

Seattle AI Lab, Kwai Inc.   *Advisor: Ji Liu, Jianshu Chen*

➢ Designed a novel parallelization algorithm for Monte Carlo Tree Search as well as a practical system implementation to achieve linear speed up while suffering negligible performance degradation. The key idea is to make use of the information from unobserved samples to guide the node selection process in the tree search. This algorithm has been used mobile to predict user pass rate of a mobile game [1].

Research on Improving Fully Connected Neural Networks   **Jan. 2017 – May. 2017**

Simulation Center of Automation College at Beihang University   *Advisor: Yuanjun Laili*

➢ Studied the fundamentals of neural networks and programmed a neural network package from scratch in MATLAB. The package contains commonly used layers in neural networks and it is easy to modify.

➢ Proposed a balance gate controlled neural network that out-performs traditional fully-connected neural networks in both regression tasks and classification tasks [4].

Skills

Programming languages: skilled in Python, Julia, C, C++, MATLAB