YONGYUAN LIANG

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EDUCATION

B.S., Mathematics and Applied Mathematics 2015-2019
Sun Yat-sen University, Guangzhou, China
GPA: 3.7/4.0 in major, 3.6/4.0 overall

Research Assistant, Carnegie Mellon University Aug.2019-
Research Intern, Microsoft Research Asia Feb.-Aug.2019
Visiting student, The Chinese University of Hong Kong (CUHK) Sept.-Dec.2018
Engineer Intern, Tencent-WeiXin Group Oct.2017-June.2018
Research Assistant, University of California, Los Angeles (UCLA) July.-Sept.2017

RESEARCH INTEREST

- Theoretical Machine Learning
- Multi-Agent Reinforcement Learning
- Optimization
- Distributed Machine Learning System

PROJECTS

Multi-Agent Resource Optimization Platform
Collaborating: Microsoft Research Asia

- As a main contributor to MARO (Multi-Agent Resource Optimization). MARO is an python-based end-to-end platform for applied multi-agent reinforcement learning.
- Developed various graph-based real-world multi-agent environments and offered popular deep RL algorithm implementations with information engineering and distributed training modules in MARO.

Motivation Engineering in Graph-based Multi-Agent Reinforcement Learning
Collaborating: University of California, Los Angeles

- Considering sequential resource allocation scenarios, we proposed methods for attentional reward engineering in multi-agent learning with graph feature processing.
- To adapt scalability of large networked multi-agent system, we represented sub-graph layers and graph-layer attention mechanism to calculate influence contagion.
- Also, we now consider a novel method to calculate agents' contribution in cooperation task to improve cooperative performance.

ASIST: A Robust and Adaptive Agent that Supports High Performance Teams
Collaborating: Carnegie Mellon University, DARPA

- ASIST is to build a generalizable and scalable agent architecture (ASIST agent) using an end-to-end theory of mind model (a modularized neural network). This project involves human team behavior monitoring, understanding, prediction, and robot assistance.
- Develop agent behavior training environment and provide a behavior dataset for ToM model training to assist large decentralized teamwork with humans in specific roles.

PUBLICATION

- **Yongyuan Liang**, Bangwei Li, Guocan Feng. Knowledge Transfer with Attention for Multi-Agent Team Learning, *under reveiw*, 2019.
- **Yongyuan Liang**, Bangwei Li, Yingnian Wu. Individual Attentional Reward Machine in Multi-Agent Reinforcement Learning, *under review*, 2019.

SKILLS

Programming Languages: C++, Python, C, Latex
Techniques: Git, CUDA, Docker, MPI
Main Course: Mathematical Analysis (4.0/4.0), Computer Language Programming (4.0/4.0), Discrete Mathematics (4.0/4.0), Multivariate Statistics (4.0/4.0)

INVITED TALKS AND ACTIVITIES

- Multi-Agent Reinforcement Learning Seminar, Microsoft Apr.2019
- Seminar for the elite Ph.D. students training program, CUHK Dec.2018
- Reinforcement Learning Theory Workshop, UCLA Aug.2017
- Machine Learning Theory Seminar, SYSU 2017-2018
- Volunteer leader of campus public welfare bookshop, SYSU 2016-2018

TEACHING EXPERIENCE

- Teaching Assistant of Discrete Mathematics (in English), SYSU 2017

HONORS AND AWARDS

- Award of Excellence for Stars of Tomorrow Internship, Microsoft Research Asia 2019
- Best Undergraduate Dissertation Award, Sun Yat-sen University (top 1) 2019
- Excellent Student Scholarship, Sun Yat-sen University (top 10%) 2018
- Outstanding Prize of Undergraduate Research, Sun Yat-sen University (top 1%) 2016/2017
- First Prize of National Olympic Physics Competition 2014
- Second Prize of National Olympic Mathematics Competition 2014