Xinran Li

Address: HKUST, Hong Kong SAR | **Email**: xinran.li@connect.ust.hk | **Google Scholar** | **Github**

EDUCATION

The Hong Kong University of Science and Technology (HKUST)   02/2022-Present

Ph.D. Candidate in Electronic and Computer Engineering, Supervisor: Prof. Jun Zhang

Research Topic: Cooperative multi-agent reinforcement learning

Beijing Institute of Technology (BIT)   09/2016-08/2020

B.Eng. of Electronic and Information Engineering, GPA: 92.35/100, ranking 1/94

Australian National University (ANU)   07/2019-06/2020

Exchange Student, GPA: 6.875/7, Supervisors: Prof. Salman Durrani & Dr. Xiaohui Zhou (Katrina)

Honor thesis: SWIPT-Enabled Cellular-Connected UAV: Energy Harvesting and Data Transmission

RESEARCH EXPERIENCE

Heterogenous Multi-agent Reinforcement Learning   01/2024-05/2024

- [NIPS' 24] **X. Li**, L. Pan, J. Zhang, "Kaleidoscope: Learnable Masks for Heterogeneous Multi-agent Reinforcement Learning," *Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2024

  Main contribution: 1) Proposed a novel adaptive partial parameter sharing scheme fostering policy heterogeneity while maintaining high sample efficiency. 2) Extended Kaleidoscope to critic ensembles to improve value estimation.

Exploration in Multi-agent Reinforcement Learning   06/2023-01/2024

- [ICML' 24] **X. Li**, Z. Liu, S. Chen, J. Zhang, "Individual Contributions as Intrinsic Exploration Scaffolds for Multi-agent Reinforcement Learning," *International Conference on Machine Learning (ICML)*, 2024

  Main contribution: 1) Investigated effective cooperative exploration strategies in sparse reward environments by encouraging individual actions that influence global transitions. 2) Utilized a conditional variational autoencoder to approximate Bayesian surprise, quantifying each agent's contribution.

Communication in Multi-agent Reinforcement Learning   02/2022-06/2023

- [AAMAS'24 Oral] **X. Li**, J. Zhang, "Context-aware Communication for Multi-agent Reinforcement Learning," *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2024. (Acceptance Rate: 25%)

  Main contribution: Proposed a receiver-centric communication scheme under low communication budgets utilizing various attention blocks. 2) Incorporated a quantization technique to discretize the messages.

- [AAMAS'23 Oral] X. Wang*, **X. Li***, J. Shao, and J. Zhang, "AC2C: Adaptively Controlled Two-hop Communication for Multi-agent Reinforcement Learning," *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2023. (Acceptance Rate: 23.3%)

  Main contribution: 1) Developed a two-hop communication scheme to expand the agents' reception field.

INDUSTRY EXPERIENCE

Embodied AI Team, TeleAI   8/2024-present

Research intern, Leader: Chenjia Bai

Main Responsibilities: Conduct cutting-edge research in multi-agent embodied AI

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Shenzhen Research Institute of Big Data, the Chinese University of Hong Kong, Shenzhen   8/2021-12/2021

Research assistant, Mentor: Rui Zhou & Liusha Yang

Main Responsibilities: Conduct research in wireless data quality assessment by proposing diversity measurement

Department of Open Source Algorithm System, SenseTime   10/2020-07/2021

Provisional developer, Mentor: Wenwei Zhang, Leader: Kai Chen

- Project: **MMPretrain (MMClassification)**, Role: Main Contributor (Github ID: LXXXXR)

   Project Descriptions: An open source pre-training toolbox based on PyTorch (part of OpenMMLab project)

   Main Responsibilities: 1) Bumped version from v0.6.0 to v0.12.0. 2) Supported new features such as multi-label classification tasks and data augmentation; reproduced algorithms such as ResNeSt. 3) Refactored codes and docs, replied issues, fixed bugs and responded to GitHub community. (More than 100 PRs)

AWARDS and SKILLS

- **Awards**:
Best Teaching Assistant Award	2023
Outstanding Graduate (Top 4%)	2020
National Scholarship (Top 2%)	2018
National Scholarship (Top 2%)	2017

- **Languages**: English (TOEFL: 113/120), Chinese (Native Speaker)

- **Coding Skills**: Proficient in Python and Pytorch; Familiar with MATLAB and Wolfram