Checheng Yu

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EDUCATION BACKGROUND

Nanjing University, Nanjing, China
B.Eng. in Automation (09/2021 - 07/2025, expected)

- Overall Score: **90.4**/100, Ranking: **2**/34

- Core Courses: Automation Control, Artificial Intelligence, Robotics, Circuit Design, System Signals

RESEARCH INTEREST

Reinforcement Learning and **R**obotics

AWARDS/HONORS/SCHOLARSHIPS/MEMBERSHIP

06/2022 Outstanding Freshman
11/2022 Second Prize, People's Scholarship (10%)
11/2023 Second Prize of Chinese Educational Robot Contest
11/2023 Second Prize, People's Scholarship (10%)
12/2023 Outstanding Student (5%)
11/2024 First Prize, People's Scholarship (5%)

PUBLICATIONS

[1]. Yuxiang Sun, Junjie Zhao, **Checheng Yu**, Wei Wang, Xianzhong Zhou. Self Generated Wargame AI: Double Layer Agent Task Planning Based on Large Language Model, arXiv:2312.01090

[2]. Junting Chen*, **Checheng Yu***, Xunzhe Zhou*, Tianqi Xu, Yao Mu, Mengkang Hu, Wenqi Shao, Yikai Wang, Guohao Li, Lin Shao. EMOS: Embodiment-aware Heterogeneous Multi-robot Operating System with LLM Agents. ***International Conference on Learning Representations*** **(ICLR) 2025**

[3]. Jinxian Zhou, Ruihai Wu, Xunzhe Zhou, **Checheng Yu**, Licheng Zhong, Lin Shao. Bi-Adapt: Few-shot Bimanual Adaptaion for Novel Categories of 3D Objects via Semantic Correspondence. *Under Review*

RESEARCH EXPERIENCES

➢ May.2024-Nov.2024 *Singapore*
Advisor: Prof. Lin Shao National University of Singapore

Foundation Model based Robot Task Planning and Skill Learning

- Collaborate on Habitat-MAS multi-robot benchmark design and build-up, worked on house-hold task dataset generation and robot skill implementation.
- Collaborate on building up embodiment-aware multi-agent system with group discussion and agent reflection using large language models(LLMs)
- Developed a VLM-based autonomous reward generation framework based on PDDL, implemented a hierarchical lifelong learning pipeline for house-hold robot environment.
- Investigate advanced affordance-guided RL using visual prompting techniques for goal-conditioned RL tasks.

➢ Oct. 2023-Apr.2024 *Nanjing, China*
Advisor: Dr. Yuxiang Sun Complex system cognition and decision making laboratory

Generative Wargame AI Based on Large Language Model

- Built a two-layer framework for agent task planning in a wargame environment using OpenAI API
- Collected the observation of environment and refined the prompts as input for GPT to make decision
- Conducted ablation experiments comparing traditional RL techniques (PPO, SAC, DQN) with LLM-based agents for strategic decision-making.

➢ Oct. 2022-Oct.2023 *Nanjing, China*

Advisor: Dr. Yuxiang Sun Complex system cognition and decision making laboratory

Multi-attribute Decision Making in Conjunction with Deep Reinforcement Learning in a Wargame Environment

- Built up an actor-critic network in wargame environment and tested the performance of several traditional reinforcement learning algorithms (PPO, A3C, etc.) in the environment
- Extracted data from the wargame environment as threat assessment of opposite chess piece, normalized each attribute by multi-attribute decision making method and learn a reward model.
- Developed an adaptive reward function based on normalized attributes using CRITIC weighting method, enhancing agent performance in multi-objective scenarios.
- Conducted ablation experiments comparing vanilla RL (PPO, A3C) with CRITIC weighted RL in adversial environment.

PROFESSIONAL SKILLS

Programming Language: C/C++, Python (Experienced), Matlab, R(Intermediate)

Tools and Libraries: PyTorch, Tensorflow, ROS, Gym, Git, OpenCV