

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 Robotics

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%)

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](https://arxiv.org/abs/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. *Under Review*, * means equal contribution.
- [3]. Affordance-assisted Reinforcement Learning via Visual Prompting. *working paper*

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 adversarial environment.

PROFESSIONAL SKILLS

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

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