

Checheng Yu

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EDUCATION BACKGROUND

09/2021-07/2025(expected) School of Management and Engineering, **Nanjing University**, Nanjing, China
B.Eng in **Automation**, Core Courses: Automation Control, Artificial Intelligence, Digital and Analog Circuit, Computer System, Signals and System, Intelligent Robot Design
Overall Score: **90.4**/100, Ranking: **2**/34
09/2018-06/2021 Bailuzhou High School of Ji'an City (Senior)

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](#)

[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 (In submission to ICLR, * 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 task design and benchmark build-up for Habitat-MAS multi-robot benchmark, worked on house-hold task dataset generation and robot skill implementation.
- Collaborate on building up LLM-based multi-agent system, worked on code implementation and prompt engineering
- Built up a VLM-based autonomous reward generation framework given PDDL task description and environment observation, implementing a robot hierarchical lifelong learning pipeline.
- Investigating affordance-guided Reinforcement Learning framework via VLM visual prompting, working on combining VLM with goal-conditioned RL .

➤ 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 the two-layer framework for agent task planning in wargame environment based on OpenAI API
- Collected the observation of environment and trained the prompts as input for GPT to make decision
- Ablation experiments on traditional RL agents trained on PPO, SAC, PK-DQN.

➤ 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 an AC framework and tested the performance of several traditional reinforcement learning algorithms (DQN, PPO) in a self-designed wargame environment
- Extracted data from the wargame environment as threat assessment of opposite chess piece, normalized each attribute by multi-attribute decision making method, then calculate each attribute's weight by using the CRITIC method for weighted summation.
- Set the reward function by using the normalized data in the RL pre-training module and compared with reward calculated by the critic network to update the parameters
- Combined the multi-attribute decision making method with A3C and tested its performance (winning rate)

PROFESSIONAL SKILLS

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

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