

# Changwei Yao

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## EDUCATION

### Carnegie Mellon University

M.S. in Information Systems

Advisor: Marios Savvides, Ji Zhang

Pittsburgh, PA

Aug. 2024 - May. 2026 (expected)

### Hunan University

B.E. in Information Security (1/41)

Advisor: Wenqiang Jin

Changsha, China

Sep. 2019 - Jun. 2023

## SKILLS & COURSEWORK

### Operating System

Linux (Ubuntu and Arch), Windows

### Programming Languages

Python, C++, MATLAB, JavaScript, L<sup>A</sup>T<sub>E</sub>X

### Physical Robots

LBR iiwa7, ARX, UR5, myCobot

### Common Libraries

PyTorch, DM\_Control, Isaccgym, Numpy/Scipy, Pandas

### Cousework

Linear Algebra, Calculus, Probability, Machine Learning

## PUBLICATION

- **Changwei Yao**, Xinzi Liu, Chen Li, Marios Savvides. "Reward Evolution with Graph-of-Thoughts: A Bi-Level Language Model Framework for Reinforcement Learning." *2026 IEEE International Conference on Robotics and Automatio (ICRA)*. (under review) [\[paper\]](#)
- Qingyang Wang\*, **Changwei Yao\***, Xingang Liu\*, Zikai Ouyang, Junwei Liu, Haibo Lu, Wei Zhang. "MinInter: Minimizing Trajectory Interpolation During Data Augmentation for Imitation Learning." *2026 IEEE International Conference on Robotics and Automatio (ICRA)*. (under review)
- Shibo Zhao, Guofei Chen, Honghao Zhu, Zhiheng Li, **Changwei Yao**, Nader Zantout, Seungchan Kim, Wenshan Wang, Ji Zhang, Sebastian Scherer. "SuperMap: Spatio Temporal Semantic SLAM Enabling Robots to Understand Evolving World in Real Time." [\[demo\]](#)
- Zejun Xu, Wenqiang Jin, **Changwei Yao**, et al. "EM-Rhythm: An Authentication Method for Heterogeneous IoT Devices." *ACM Transactions on Sensor Networks* (2024). [\[paper\]](#)
- Miaomiao Yang\*, **Changwei Yao\***, Shijin Yan\*. "Age Estimation Based on Graph Convolutional Networks and Multi-head Attention Mechanisms." *2023 IEEE 6th International Conference on Information Systems and Computer Aided Education (ICISCAE)*. IEEE, 2023.

## EXPERIENCE

### CyLab Biometrics Center

Part-time Research Assistant. Supervised by Prof. Marios Savvides

Sep. 2024 - Now

CMU, PA

- Developed a chat AI agent for navigation at Dubai Airport.
- Enabled LLM to decompose manipulation tasks with **Graph of Thoughts**, helping LLM design more effective reward functions for RL agent in simulation.
- Finding a way to align the **affordance map** and language with the first observed frame of the task. Exploring better methods to enable the **low-level controller** to guide actions more effectively within the VLA framework.

### Ji's Lab at Robotics Institute

Part-time Research Assistant. Supervised by Prof. Ji Zhang

Sep. 2024 - Mar. 2025

CMU, PA

- Introduced a unified **scene graph** to track objects over time, which allows a robot to build an abstract metric-semantic representation.
- Leverage open-vocabulary 3D semantics network to support the detection and tracking of both short-term and long-term **dynamic objects**.

Control & Learning for Robotics and Autonomy Lab

Full-time Research Assistant. Supervised by Prof. Wei Zhang

- Implemented a **distillation** method for Diffusion Policy, enhancing inference speed for efficient, low-latency visuomotor control in resource-constrained robots.
- Explored a novel **data augmentation** method using model-free optimization for imitation learning.

IoT Sensing and Security Lab

Part-time Research Assistant. Supervised by Prof. Wenqiang Jin

- Researched machine learning, signal processing, and their application in IoT security.
- Designed a system for heterogeneous IoT device security using electromagnetic signals.

Jun. 2023 - Jun. 2024

SUSTech, China

Oct. 2021 - Aug. 2022

HNU, China

PROJECTS

Deep Reinforcement Learning for Minecraft

Personal Project.

- MineRL Integration:** Encapsulated the Minecraft environment within the MineRL library.
- AI Agent Training:** Trained a tree-chopping AI agent using Deep Q-Learning to learn from demonstrations and achieve automated task execution.

Computer Vision Somatic Analysis Method System

Computer Software Copyright. Authorized by China Copyright Protection Center

- Software Development:** Developed an IoT software using Heartbeat technology for resource takeover, emphasizing multi-threading and dynamics.
- Diverse Functionality:** Implemented numerous functions, including Analysis Method View & Management, Posture Analysis Matching, etc.

Apr. 2023 - May. 2023

Changsha, China

Mar. 2022 - May. 2022

Changsha, China

HONORS & AWARDS

Second Place Award	National College Student Information Security Competition
Meritorious Winner	COMAP’s Mathematical Contest in Modeling
Second Place Award	MathorCup College Mathematical Modeling Contest
Merit Award	Electronic Systems Engineering Skills Competition