PEIQI YU

peiqiy@andrew.cmu.edu ◇ (1)8788349166
linkedin.com/in/peiqi-yu

EDUCATION

Carnegie Mellon University 2024.8 - 2029.5
Ph.D. Student of Electrical and Computer Engineering
Advisor: Changliu Liu, Associate Professor
Research Interest: Generalizable Robotic Manipulation, Reliable Long-horizon Robotic Manipulation, Generative Control

Tsinghua University 2019.8 - 2023.6
B.E. in Automation

AWARDS

ICRA WBCD Competition – 1st Prize [url] 2025.5
Electronics Design Contest of Tsinghua University – 2nd Prize 2022.10
The Challenge Cup of Tsinghua University – 3rd Prize 2021.10

PUBLICATIONS

Contingency Planning for Safety-Critical Autonomous Vehicles: A Review and Perspectives
ArXiv Preprint (submitted to Annual Reviews in Control, 2026) [url]
Lei Zheng, Luyao Zhang,**Peiqi Yu**, Yifan Sun, Sergio Grammatico, Jun Ma, Changliu Liu

NeSyPack: A Neuro-Symbolic Framework for Bimanual Logistics Packing 2025
RSS 2025 Workshop on Benchmarking Robot Manipulation [url]
Bowei Li*, **Peiqi Yu***, Zhenran Tang, Han Zhou, Yifan Sun, Ruixuan Liu and Changliu Liu

Robustifying Long-term Human-Robot Collaboration through a Hierarchical and Multimodal Framework 2024
ArXiv Preprint [url]
Peiqi Yu, Abulikemu Abuduweili, Ruixuan Liu and Changliu Liu

Recovering Realistic Details for Magnification Arbitrary Image Super-Resolution 2022
IEEE Transactions on Image Processing [url]
Cheng Ma, **Peiqi Yu**, Jiwen Lu and Jie Zhou

RESEARCH PROJECTS

SkillGraph-based Dual-Arm Robotic Manipulation for Lego Assembly 2024 – 2025
AI Data Foundry (AIDF) Funding Project, Carnegie Mellon University
Advisor: Prof. Changliu Liu
* Designed and implemented the SkillGraph ontology, defining skills, executors, metrics, and dependencies for modular, domain-agnostic task planning.
* Developed an interactive WebGUI enabling intuitive skill execution, parameter inspection, and configuration-based skill addition.
* Built the frontendbackend pipeline supporting simulation control, skill composition, and human–system interaction.

ManiSkillFormer: An Object-Centric Neuro-Symbolic Framework for Zero-Shot Robotic Manipulation 2025 – now
Research Project, Carnegie Mellon University
Advisor: Prof. Changliu Liu

* Design the neuro-symbolic manipulation pipeline integrating semantic 3D perception, SkillGraph-based skill primitives, symbolic planning, and run-time monitoring for closed-loop reasoningsensingacting.
* Developed the SkillGraph ontology and system architecture enabling zero-shot generalization across unseen objects, complex multi-step tasks, and cross-embodiment deployment.
* Designed and executed real-world experiments demonstrating reliability in long-horizon manipulation, functional skill composition, and transfer between robotic embodiments.

Neural IK + Feasibility-Guided Generative Grasping 2025

Course Project, Carnegie Mellon University

* Built a neural inverse-kinematics surrogate model to predict grasp pose feasibility, enabling fast evaluation without calling classical IK solvers.
* Integrated the Neural IK model into a diffusion-based grasp generator to guide denoising using learned feasibility gradients.
* Achieved significant reductions in tracking error and improvements in feasible grasp success rates while preserving generative diversity.

WORK EXPERIENCES

ModelBest Inc (startup) 2024.3 - 2024.7

Research Intern (Beijng, China)

Main Job: Research on vision language model and imitation learning to perform long-horizon robot action sequences.

Skills: Python

QuanMol Tech (startup) 2022.7 - 2024.3

Engineer Intern (Remote)

Main Job: Developed both GPU-based and CPU-based docker images and deploy them to AWS to realize front-end and back-end interactions.

Skills: Python, AWS, Docker

Beijing Academy of Blockchain and Edge Computing 2021.7 - 2021.9

Algorithm Intern (Beijing, China)

Main Job: Developed precise sleep-staging algorithms using Support Vector Machines (SVM), Random Forest, and Neural Networks, controlling the prediction error within 5-minutes range.

Skills: Python, SQL

TECHNICAL SKILLS

Languages Python, C++, Matlab, SQL
Hardware G1, Yaskawa, Kinova, Raspberry Pi
Libraries ROS, OpenCV, PyTorch