

# YOUNGJIN HONG

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## RESEARCH INTERESTS

Vision-Language-Action Models, Multimodal Representation Learning, Generative Policies for Robotic Manipulation.

## EDUCATION

### University of Minnesota (UMN)

Ph.D. Electrical Engineering

Minneapolis, MN, USA

Sep. 2024 – Present

### Sungkyunkwan University (SKKU)

M.S. in Mechanical Engineering

B.S. in Mechanical Engineering

Suwon, Korea

Mar. 2022 – Feb. 2024

Mar. 2016 – Feb. 2022

## WORK EXPERIENCE

### Robot Research Assistant [\[Website\]](#)

Choice Robotics Lab, University of Minnesota

Minneapolis, MN

Sep. 2024 – Present

- Conducting research on multimodal reasoning and generative refinement models for large-scale robot manipulation.
- Developing a VLM-based multi-person attribute-conditioned tracking system for real-time visual monitoring.

### Robot Research Engineer [\[Website\]](#)

Hanwha Aerospace, Manned-Unmanned Teaming (MUM-T) Research Center

Seoul, Korea

Jan. 2024 – Jul. 2024

- Built Unmanned Ground Vehicle (UGV) simulation environments with Isaac Sim for vision-based autonomy.
- Contributed to a defense proposal for next-generation unmanned ground vehicle technologies.
- Performed field testing and piloting of an unmanned ground vehicle autonomy prototype.

## SELECTED PROJECTS

### Generative Residual Action Refinement for Manipulation (Ongoing Research)

Oct. 2025 – Present

- Building a Flow Matching-based generative refinement model that learns residual corrections to improve general-purpose manipulation policies.
- Benchmarking refinement architectures (Mamba-driven Flow Matching, CVAE) across diverse manipulation tasks.

### Language-Action Cycles for Learning Manipulation Tasks

Jun. 2025 – Oct. 2025

- Proposed a bidirectional language-action cycle that jointly learns action-to-language and language-to-action mappings for scalable behavior acquisition.
- Designed a semantic consistency verifier for filtering self-generated samples, enabling reliable self-improvement.

### Vision-Based Planar Pushing for Service Robotics (SKKU)

Jul. 2022 – Dec. 2024

- Developed a learning-based 2D non-prehensile motion planner for dishware with unknown physical properties.
- Automated synthetic train data using Isaac Gym simulator to train the push planning network.

## SELECTED PUBLICATIONS / PRESENTATIONS

**Youngjin Hong\***, Houjian Yu\* (\*equal contribution) et al., "LACY: A Vision-Language Model-based Language-Action Cycle for Self-Improving Robotic Manipulation", *under review at ICRA 2026*. [\[Website\]](#) [\[Paper\]](#)

Mingen Li, Houjian Yu, Yixuan Huang, **Youngjin Hong**, Hantao Ye, Changhyun Choi. "Hierarchical DLO Routing with Reinforcement Learning and In-Context Vision-language Models", *under review at ICRA 2026*. [\[Website\]](#) [\[Paper\]](#)

**Youngjin Hong** et al., "Vision-based Stable 2D Planar Pushing of Dishware with 6-DOF Manipulator," *ECCOMAS Thematic Conference on Multibody Dynamics*, 2023. [\[Website\]](#) [\[Paper\]](#) [\[Demo\]](#)

**Youngjin Hong** et al., "Stable Dishware Pushing via Convolutional Neural Networks," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023. (Late Breaking Results) [\[Website\]](#) [\[Paper\]](#) [\[Demo\]](#)

## SKILLS

**Programming:** Python (proficient), MATLAB, C++ (familiar) | **Tools:** Docker, Git, Linux

**Deep Learning:** PyTorch, HuggingFace, Generative Models, **Vision-Language Models (VLMs)**

**Robotics:** ROS, Isaac (Gym & Sim), Gym, MuJoCo, Coppeliasim

**Courses:** Intelligent Robotics, **Robot Vision**, **Deep Learning**, Reinforcement Learning, Image Processing, **Advanced Topics in Generative AI and Conditional Generation**, Optimization Theory