

Hyeonjun Cho

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Research Interests Imitation learning; diffusion policies; vision-language manipulation; safe and recovery-aware robot learning.

EDUCATION

Exp. Aug. 2027 **Sungkyunkwan University**
B.S. in Mechanical Engineering; Double Major in Physics.
Major GPA: Mechanical Engineering **3.73 / 4.5**; Physics **3.92 / 4.5**. Final semester: Spring 2027.

RESEARCH EXPERIENCE

Fall 2024 – Present **Robotics Innovatory, Sungkyunkwan University**
Undergraduate Researcher. Advisor: Prof. Hyouk Ryeol Choi.

2026 – Present **Recovery-Aware LPB for RMP-Induced OOD States in Real-Robot Diffusion Policies**
Manuscript in preparation.

- Developed a real-robot framework combining diffusion policy references, **RMPflow reactive avoidance**, and LPB latent guidance for recovery from avoidance-induced OOD states.
- Reimplemented **Latent Policy Barrier** and augmented its latent-dynamics model with **post-avoidance recovery transitions** from real RMP interventions, with the base policy held fixed.
- Achieved **91.3% success (146/160)** across eight real-robot OOD start configurations, versus 64.4% (original LPB), 63.8% (fine-tuning on the same recovery demonstrations), and 25.0% (base policy).
- Built an **RB10 / ROS 2 evaluation pipeline** synchronizing policy references, RMP-modified executions, dual-camera observations, proximity signals, and LPB internal states.

2025 **RAGTAL / DNA-HERO: Force-Feedback Teleoperation and Imitation Learning**
Learning Lead. Multidisciplinary industry-academia team project, Sungkyunkwan University.

- Led the **end-to-end learning pipeline**: demonstration preprocessing, BC-Transformer and image diffusion policy training, checkpoint deployment, and RB10 rollout.
- Deployed the learning stack on a custom teleoperation system with **external F/T sensing and force feedback**, integrating dual RGB-D observations, OnRobot gripper I/O, and RB10 control.
- Evaluated BC-Transformer against diffusion policy with **50 real-robot rollouts per model**; the integrated system completed **9/10 final-presentation trials** across three manipulation tasks.

Spring 2025 **VLM-Grounded, Memory- and Gripper-Aware LMTG**
Undergraduate Research Program.

- Integrated GPT-based visual grounding with **Lang-SAM**, task memory, grasp-mode selection, and failure replanning for PyBullet and RB10 manipulation.
- Raised task success on a 15-scenario evaluation set from **9/15 to 12/15** by enforcing task-order verification and explicit prompt constraints.

Winter 2024 – 25 **LLM-Based Zero-Shot Trajectory Generation (LMTG)**
Undergraduate Research Program.

- Reproduced LMTG on Franka and PyBullet, extending it with object-aware waypoint and end-effector orientation refinement, height-based collision avoidance, and initial **sim-to-real perception integration**.

HONORS AND AWARDS

2025 **Grand Prize**, Creative Innovation DNA-HERO Industry-Academia Team Project. Sungkyunkwan University stage; selected as university representative.

2025 **Silver Award**, Consortium Creative Capstone Design Competition, National Preliminary Round.

TECHNICAL SKILLS

Languages, Frameworks Python; PyTorch; ROS and ROS 2; Robomimic
Robot Learning Diffusion Policy; BC-Transformer; RNN-GMM; VLM-based manipulation; Lang-SAM; LMTG
Control, Simulation RMP / RMPflow; RB10 ServoJ and Jacobian control; MuJoCo; robosuite; PyBullet
Hardware, Sensing Rainbow Robotics RB10; Intel RealSense RGB-D; OnRobot and Dynamixel grippers; proximity and force/torque sensors