

Joong-Gil Kim

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Research Interests

My research goal is to build robots that learn complex control skills in simulation and carry them over to real hardware without losing reliability. I am particularly interested in reinforcement learning for proprioceptive reactive manipulation with dexterous hands, and in the high-fidelity physics simulation that makes such policies transfer to the real robot. I am also interested in locomotion and humanoid whole-body control, with a longer-term interest in physical intelligence for entire robot systems.

Education

Korea University of Technology and Education <i>M.S. in Electronic Engineering (Advisor: Yong-Jae Kim)</i>	Mar 2025 – Feb 2027 (expected) <i>Cheonan, Korea</i>
Korea University of Technology and Education <i>B.S. in Mechatronics Engineering</i>	Mar 2020 – Feb 2025 <i>Cheonan, Korea</i>

Research Experience

IRIM Lab, Korea University of Technology and Education <i>Research Assistant (Advisor: Yong-Jae Kim)</i>	Sep 2024 – Present <i>Cheonan, Korea</i>
<ul style="list-style-type: none">Simulation lead for ALLEX, a humanoid upper-body robot with dexterous hands: built its simulation framework and sim-to-real pipeline, including nonlinear motor-joint modeling.Transferred a proprioceptive reactive manipulation RL policy to the real ALLEX.	
Neuromeka <i>Research Intern</i>	Jul 2024 – Aug 2024 <i>Pohang, Korea</i>
<ul style="list-style-type: none">Built smart-factory simulation environments in NVIDIA Isaac Sim.	
Control and Dynamic Systems Lab, Korea University of Technology and Education <i>Undergraduate Research Assistant (Advisor: Hong-keun Kim)</i>	Sep 2023 – Aug 2024 <i>Cheonan, Korea</i>

Honors and Awards

Bronze Award (3rd Place), 2nd Koh Young AI Competition Held at ICCAS 2024, Jeju, Korea. For the 3-DOF inverted pendulum swing-up and stabilization project.	2024
Grand Prize, UCLA RoMeLa Director’s Award, Robot Utilization Idea Competition 1st place out of 112 teams nationwide. For the Reusable Sky-Jump Robot.	2023
3rd Place, Korea Association of Robot Industry Chairman’s Award, R-BIZ Challenge ZEUS Industrial Robot ZERO Mission. For the Toppled Vial Cylinder Removal Robot.	2023

Publications

- [4] Taemoon Jeong, Doyoung Kim, Sun Woo Kim, **Joong-Gil Kim**, Seunghean An, Yoonbyung Chai, Chanwoo Kim, Taehyun Byun, Sangseung Kang, Youngwoo Yoon, Yong-Jae Kim, Xue Bin Peng, Kyungjae Lee, and Sungjoon Choi.
FAMoR: Fine-grained Agentic Motion Retargeting via Local Refinement, IEEE International Conference on Robotics and Automation (ICRA), 2027 (*under review*).
- [3] Juhan Park, Yeoncheol Jang, **Joong-Gil Kim**, Junha Cha, Hansol Park, Kyungjae Lee, Yong-Jae Kim, and Sungjoon Choi.
Unifying Fingertip Motion and Joint Posture for Dexterous Hand Retargeting, IEEE International Conference on Robotics and Automation (ICRA), 2027 (*under review*).
- [2] **Joong-Gil Kim**, Wontae Ye, Geunwoo Cho, Seong-Ho Yun, Se-Hyoung Cho, and Yong-Jae Kim.
Comparative Study on Agility, Efficiency, and Impact Absorption of Bipedal Robots with Active Toes, International Conference on Control, Automation and Systems (ICCAS), 2026.
- [1] Juhan Park, Taerim Yoon, Seungmin Kim, **Joong-Gil Kim**, Wontae Ye, Jeongeun Park, Yoonbyung Chai, Geonwoo Cho, Geunwoo Cho, Dohyeong Kim, Kyungjae Lee, Yong-Jae Kim, and Sungjoon Choi.
Learning Dexterous Grasping from Sparse Taxonomy Guidance, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2026.

Academic Service

IEEE International Conference on Robotics and Automation (ICRA)	2027 (in progress)
Reviewer	

Projects

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| ALLEX Simulation Model Release
<i>Simulation lead, with WIRobotics</i> | Jun 2026 |
| <ul style="list-style-type: none">Public release of the ALLEX simulation model, validated against the physical robot so that simulated and real behavior match down to contact forces. | |
| 3-DOF Inverted Pendulum
<i>Team Pluto X, KOREATECH</i> | Oct 2024 |
| <ul style="list-style-type: none">Swing-up and stabilization control of a three-degree-of-freedom inverted pendulum. | |
| Reusable Sky-Jump Robot
<i>Team project, KOREATECH</i> | Dec 2023 |
| <ul style="list-style-type: none">Proposed a reusable design for the Sky-Jump jumping robot, extending the concept introduced by Prof. Dennis Hong (UCLA RoMeLa). | |
| Toppled Vial Cylinder Removal Robot
<i>Team project, KOREATECH</i> | Oct 2023 |
| <ul style="list-style-type: none">Vision-guided robot that detects vials toppled over on a pharmaceutical vial-transfer conveyor line and removes them automatically, keeping the packaging process running without manual intervention. [video] | |

Technical Skills

Programming	Python (primary); MATLAB, C
Simulation	Isaac Sim, Isaac Lab, MuJoCo, Genesis, Newton
GPU Computing	NVIDIA Warp
Learning	PyTorch, reinforcement learning, imitation learning
Tools	Linux, Git, ROS 2, AWS