Kim, Jae Hyung

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Objective

Passionate robotics researcher focusing on robot intelligence and manipulation. Working on designing hardware/software suited for contact-rich manipulation and sim-to-real.

Educational Background

M.S. in KAIST   03/2023 – 02/2025
- Majoring in Graduate School of AI
- Cumulative GPA to date: 3.93/4.3
- Expected Graduation: 02/2025

B.S. in Seoul National University   03/2017 – 02/2023
- Double Majoring in Mechanical Engineering & Computer Science and Engineering
- Graduated Summa Cum Laude (Total GPA: 4.02/4.3)
- Leave of absence for military service: Jan. 2019 – Nov. 2020

Gyeonggi Science High School   03/2014 – 02/2017
- Summer internship about Neural Network-Friendly Hardware at POSTECH DICE Lab - 2016
- Korea Physics Certification System level 1 (the lower the better)
- Participated in Korean Young Physicists' Tournament, KYPT 2015

Research Experiences

KAIST Intelligent Mobile Manipulation Lab   02/2022 – PRESENT

- An Intuitive Multi-Frequency Feature Representation for SO(3)-Equivariant Networks: D, Son., **Kim, J.**, Son, S., & Kim, B. ICLR. 2024.
  - Write mathematical proof of the SO(3) equivariance & properties of the proposed representation

- Representation and Diffusion-based Perception Algorithm for Efficient Manipulation using Multi-view RGB Images: D, Son., Son, S., **Kim, J.** & Kim, B. under review. 2024.
  - Grasp transparent, shiny & unknown objects using multiple RGB images
  - LLM prompting for target object specification

- Pre-and post-contact policy decomposition for non-prehensile manipulation with zero-shot sim-to-real transfer: Kim, M., Han, J., **Kim, J.**, & Kim, B. IROS. 2023.
  - Train contact-rich manipulation RL policy using Isaac Gym
  - Fine-tuning & continuous training for sim-to-real

- A Low Sim-to-real gap Manipulator Hardware and Software Design: **Kim, J.**, Kim, J., Lee, D., Jang, Y. & Kim, B. (In progress)
  - Design & model 6-DoF QDD manipulator from scratch
  - Dynamic contact-rich manipulation sim-to-real using RL and Isaac Gym
  - (In progress) Bimanual dynamic manipulation

- Open X-Embodiment: Robotic Learning Datasets and RT-X Models: Open X-Embodiment Collaboration, ICRA. 2024.
  - Generate RL-based zero-shot manipulation dataset

Experience and Projects

Silver prize (2nd prize) at SNU Graph Pattern Matching Challenge   06/2021 – 08/2021
Graph Algorithm Design and Implementation (C++)   Seoul National Univ.
- Find many matching orders with input graph data
- Co-programming with teammate (git)

'18 Robocon International Design Contest   08/2018 – 08/2018
Robot Design and Assembly   Tokyo Institute of Technology
- Design and assemble each transport robot part by using CAD
- Communicate and collaborate with worldwide students

ZERO (Autonomous Driving Algorithm Student Club)   04/2021 – 08/2021
Path Planning team (C++ and ROS) Seoul National Univ   Seoul National Univ.
- Participated in Path planning algorithm and ROS study group

Awards and Honors

- Samsung Electronics CE/IM Intern   08/2021 – 09/2021
- College Physics Tutor   03/2018 - 12/2018, 03/2021 – 12/2021
- Company-sponsored Full-funded Scholarship   09/2018 – 02/2023
- Scholarship for academic excellence   09/2017, 03/2018

Personal Skills

- Lots of experience in RL manipulation, sim-to-real techniques, and real robot experiments
- Intermediate level of Python, PyTorch, JAX, C++, SolidWorks, Isaac Gym
- Passionate attitude to learn