Kim, Jae Hyung

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Research Interests

Passionate robotics researcher specializing in robot intelligence and manipulation, with expertise in contact-rich tasks and sim-to-real transfer of learning-based policies through the design of both software and hardware systems.

Education

- **M.S. in Graduate School of AI, KAIST** 03/2023 – 02/2025
  Advisor: Beomjoon Kim
  GPA: 3.93/4.3
- **B.S. in Double Major: ME & CSE, Seoul National Univ.** 03/2017 – 02/2023
  GPA: 4.02/4.3 (Graduated Summa Cum Laude, Ranking: 5/71)
  Leave of absence for military service: Jan. 2019 – Nov. 2020

Research Experience

- **KAIST Humanoid Generalization Lab (Advisor: Beomjoon Kim)** 03/2022 – 02/2025
  - **A low-cost and lightweight 6 DoF bimanual arm for dynamic and contact-rich manipulation** [project]
    J. Kim, J. Kim, D. Lee, Y. Jang, B. Kim, RSS 2025
    Led a team for over a year to design and develop HW and SW of an open-source 6-DoF QDD-based dual-arm manipulator from the ground up, tailored for dynamic and contact-rich manipulation tasks. Successfully demonstrated advanced capabilities, including bimanual object throwing, hammering, and zero-shot sim-to-real transfer of RL policies trained in Isaac Gym.
  - **Pre- and Post-Contact Policy Decomposition for Non-Prehensile Manipulation with Zero-Shot Sim-to-Real Transfer** [project]
    M. Kim, J. Han, J. Kim, B. Kim, IROS 2023
    Developed contact-rich manipulation policies with reinforcement learning in Isaac Gym and fine-tuned models for sim-to-real transfer with continuous learning. Introduced an RL action-scale curriculum to balance real-world safety and simulation exploration.
  - **Open X-Embodiment: Robotic Learning Datasets and RT-X Models** [project]
    Open X-Embodiment Collaboration, ICRA 2024, Best paper
    Contributed to generating a zero-shot sim-to-real non-prehensile RL manipulation dataset.
  - **An Intuitive Multi-Frequency Feature Representation for SO(3)-Equivariant Networks** [project]
    D. Son, J. Kim, S. Son, B. Kim, ICLR 2024
    Contributed theoretical insights and developed mathematical proofs for SO(3) equivariance and properties of the proposed representation.
  - **Representation and Diffusion-based Perception Algorithm for Efficient Manipulation using Multi-view RGB Images**
    D. Son, S. Son, J. Kim, B. Kim, (under review), 2025
    Developed an object detection system leveraging multiple RGB images and grasping techniques for transparent, shiny, and unfamiliar objects. Utilized LLM prompting and CLIP for object and goal specification.
- **SNU Movement Research Lab (Advisor: Jehee Lee)** 11/2021 – 02/2022
  - Developed and implemented quadrupedal locomotion algorithms with RL in PyBullet.

Experience and Projects

- **Intern, Samsung Electronics CE/IM**, Mobile Experience Division 08/2021 – 09/2021
  Conducted heat dissipation analysis and design for laptops using NX.
- **Silver Prize at SNU Graph Pattern Matching Challenge** 06/2021 – 08/2021
  Developed and implemented graph pattern matching algorithms in C++ for complex graph structures, collaborating with a teammate via Git.
- **Robocon International Design Contest**, Tokyo Institute of Technology 08/2018
  Designed and assembled robot components using CAD and collaborated with international students on the project.
- **ZERO (Autonomous Driving Student Club)**, Seoul National Univ. 04/2021 – 08/2021
  Joined the Path Planning Team and participated in a study group focused on path planning algorithms using C++ and ROS.
- **College Physics Tutor**, Seoul National Univ. 03/2018 – 12/2018, 03/2021 – 12/2021

Talks and Presentations

- **KROC 2025 Flagship Conference** 02/2025
  Presented "An Intuitive Multi-Frequency Feature Representation for SO(3)-Equivariant Networks."
- **2023 KAIST AI Technology Symposium** 05/2023
  Delivered a talk on "Reinforcement Learning for Manipulating Ungraspable Objects."
- **Conference Poster Presentations** 2023–2024
  Showcased research posters at ICLR 2024 and IROS 2023.

Awards and Honors

- Company-sponsored Full-funded Scholarship 09/2018 – 02/2023
- Scholarship for Academic Excellence 09/2017, 03/2018

Skills

- Strong experience in training and transferring sim-to-real techniques, with demonstrated dynamic, contact-rich object manipulation.
- Proficient in Python, Isaac Gym, PyBullet, PyTorch, and JAX.
- Comfortable using C++ and SolidWorks for intermediate tasks.
- Highly motivated with a strong ability to learn quickly and adapt to new challenges.