Jiwoo Kim

jiwoo.kim@duke.edu || https://indigoyeoma.github.io

Durham, NC, U.S.A

RESEARCH INTERESTS

Robotics, Reinforcement Learning, Geometric Deep Learning

EDUCATION

Duke University, Ph.D.   Aug.2024 - Present
Electrical and Computer Engineering   Seoul, Republic of Korea
advised by Prof. Miroslav Pajic

Yonsei University, B.S.   Mar.2021 - Feb.2024
Electrical and Electronic Engineering   Seoul, Republic of Korea

Kwangwoon University   Mar.2017 - Feb.2021
Major in Electrical Engineering   Seoul, Republic of Korea

- Leave of absence due to military service 2018 - 2020
- Transfer to Yonsei University

PUBLICATIONS

[1] Hyunwoo Ryu, <u>Jiwoo Kim</u>, Junwoo Chang, Hyun Seok Ahn, Joohwan Seo, Taehan Kim, Yubin Kim, Jongeun Choi, Roberto Horowitz. **"Diffusion-EDFs: Bi-equivariant Denoising Generative Modeling on SE(3) for Visual Robotic Manipulation."** CVPR, 2024 **(Spotlight)**

[2] Junwoo Chang*, Hyunwoo Ryu*, <u>Jiwoo Kim</u>, Soochul Yoo, Joohwan Seo, Nikhil Prakash, Jongeun Choi, Roberto Horowitz. **"Denoising Heat-inspired Diffusion with Insulators for Collision Free Motion Planning."** NeurIPS Workshop on Diffusion Models, 2023 (*Equal Contribution)

[3] <u>Jiwoo Kim</u>*, Hyunwoo Ryu*, Jongeun Choi, Joohwan Seo, Nikhil Prakash, Ruolin Li, Roberto Horowitz. **"Robotic Manipulation Learning with Equivariant Descriptor Fields: Generative Modeling, Bi-equivariance, Steerability, and Locality."** RSS Workshop on Symmetries in Robot Learning, 2023 (*Equal Contribution) **(Oral, Best Paper Award)**

[4] Sarmad Idrees, <u>Jiwoo Kim</u>, Jongeun Choi, Soekman Son. **"Human Motion Prediction: Assessing Direct and Geometry-Aware Approaches in 3D Space."**, IEEE Access

AWARDS & SCHOLARSHIPS

Best Academic Presentation Award.   Oct.2023
Best Paper Award at *RSS Workshop on Symmetriesin Robot Learning*   Jul.2023
Jinri (Excellent Academic Performance) Scholarship by Yonsei Univ. $\times$ 2   Jun., Dec.2022
Samhwajibong Scholarship Foundation Scholarship   Jun.2022
Commendation Award for Social Services   May.2022

RESEARCH EXPERIENCE

MLCS lab, Yonsei   Jul.2022 - Present
Advised by Prof. Jongeun Choi
Undergraduate Research Intern

- Real-world Diffusion-EDF pick experiment using Franka Emika Panda showcased live.
  - Designed the end-to-end pick and place experiment code, engineered with ROS, C++, and Python for Franka Emika Panda, achieving a 85% success rate.
  - Applied RTAB-Map and point cloud reconstruction techniques for visual point cloud data.
  - Led a team of 4 interns during the project.
- Reinforcement Learning (RL) project using Mujoco for custom mobile manipulation.
  - Engineered an interface with Gym, Mujoco, and customized URDF files for our custom robot.
  - Implemented Soft Actor-Critic (SAC) algorithm enabling the robot to move and pick the object with high manipulability.

Capstone Project   Jan.2022 - Jun.2022
Advised by Prof. Jong-Moon Chung
Team leader

- Study on Azure MEC Computation Offloading Based on 5G massive Machine-Type Communications (mMTC) and Ultra-Reliable and Low Latency Communications (URLLC).
  - Experimented IoT and UE Popularity-based Energy Optimization (IPEO) for data transfers based on real-time load and traffic conditions, using MATLAB and AWS server.

TEACHING EXPERIENCE

Engineering Information Processing (ENG1108)   Sep.2023 - Dec.2023
Teaching Assistant
- Facilitated interactive sessions on C programming with Linux OS for undergraduate students.

RESEARCH SKILLS

Computer Languages	Python, ROS, C++, C
Simulations	Mujoco, Sapien, Pybullet, Gazebo
Modeling	Meshlab, Blender, AutoDesk360
Tools	MATLAB, Moveit, Latex

ENGLISH PROFICIENCY

TOEFL	Total score : 114 / 120
	(Reading: 29, Listening: 30, Speaking: 29, Writing: 26)

LANGUAGE

English	Native
Korean	Native
Spanish	Intermediate

OTHER EXPERIENCE

Electrical and Electronic Engineering Honor Society   2022 - 2024
- Led the study group on Reinforcement Learning (RL) and Digital Signal Processing (DSP) Class.

Served in the Republic of Korea Air force   2018 - 2020
- Served in the Republic of Korean Air Force, 8th Fighter Wing, Information and Communication Battalion, as a Base Communication Control Office (B.C.C.O) soldier.

Korean Red Cross Youth (RCY)   2017 - 2018
- Volunteered to help patients diagnosed with leprosy in the National Sorokdo Hospital, Republic of Korea.