Jiwoo Kim

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Seoul, Republic of Korea

RESEARCH INTERESTS

Robotics, Machine Learning, Reinforcement Learning

EDUCATION

Yonsei University, B.S.   Mar.2021 - Present
Major in Electrical and Electronic Engineering   Seoul, Republic of Korea

PUBLICATIONS

[1] Hyunwoo Ryu, Jiwoo Kim, 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."** Arxiv, 2023

[2] Junwoo Chang*, Hyunwoo Ryu*, Jiwoo Kim, 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] Jiwoo Kim*, 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)*

WORK IN PROGRESS

[1] Sarmad Idrees, Jiwoo Kim, Jongeun Choi, Soekman Son. **"Human Motion Prediction: Assessing Direct and Geometry-Aware Approaches in 3D Space."**

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 the AWS server.

SCHOLARSHIP & AWARDS

Best Academic Presentation Award   Oct.2023
- The best technical demo presentation for the 5th Yonsei University Mechanical Engineering Graduate Student Academic Conference.

Jinri (Excellent Academic Performance) Scholarship $\times$ 2   Jun., Dec.2022
- Academic excellence scholarship granted by Yonsei University.

Samhwajibong Scholarship Foundation Scholarship   Jun.2022

Commendation Award for Social Services   May.2022

TEACHING EXPERIENCE

Engineering Information Processing (ENG1108)   Sep.2023 - present
Teaching Assistant
- Facilitated interactive sessions on C programming fundamentals 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 - present
- 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.

REFERENCE

Prof. Jongeun Choi	Prof. Jong-Moon Chung	Prof. Roberto Horowitz
School of Mechanical Engineering	Department of Electrical and Electronic Engineering	Department of Mechanical Engineering
Yonsei University	Yonsei University	UC Berkeley
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