

# Jiwoo Kim

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Seoul, Republic of Korea

## RESEARCH INTERESTS

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**Robotics, Machine Learning, Reinforcement Learning**

## EDUCATION

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**Yonsei University, B.S.**

Major in Electrical and Electronic Engineering

Mar.2021 - Present

Seoul, Republic of Korea

## PUBLICATIONS

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[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."** Under Review, 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

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

## RESEARCH EXPERIENCE

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**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

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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 × 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

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

## RESEARCH SKILLS

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

## ENGLISH PROFICIENCY

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

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English	Native
Korean	Native
Spanish	Intermediate

## OTHER EXPERIENCE

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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.	