Joonkyung Kim

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CY303, 35 Backbeom-ro, Mapo-gu, Seoul 04107, South Korea

Education

Sogang University Seoul, South Korea
- *M.S., Electronic Engineering* (Advisor: Prof. Changjoo Nam) *Mar. 2023 – (expected) Aug. 2025*
- *B.S., Electronic Engineering* (Cum Laude) *Mar. 2017 – Feb. 2023*

Carnegie Mellon University Pittsburgh, United States
- *Visiting Scholar, S3D in Computer Science* *Aug. 2024 – Feb. 2025*

Research Experiences

Advanced Agent-Robotics Technology Lab, Carnegie Mellon University Pittsburgh, United States
Visiting Scholar *Aug. 2024 – Feb. 2025*
- Researched safety enhancement for foundation models in visual navigation under Dr. Woojun Kim and Prof. Katia Sycara.

AI Robotics Lab, Sogang University Seoul, South Korea
Graduate Researcher *Mar. 2023 – Present*
- Developed simulation environments (PyBullet, Isaac Sim) and real-robot systems (ROS2, TurtleBot4) for multi-robot navigation, focusing on safety and conflict resolution

AI Robotics Lab, Sogang University Seoul, South Korea
Undergraduate Intern *Sep. 2022 – Feb. 2023*
- Developed DRL-based navigation for mobile robots in confined spaces with randomly placed obstacles
- Contributed to Pick-and-Place project using a mobile manipulator, gaining experience with the ROS Navigation Stack [Video]

Machine Decision Intelligence & Learning Lab, KAIST Daejeon, South Korea
Undergraduate Visiting Student *Jan. 2022 – Feb. 2022*
- Studied theoretical foundations of Reinforcement Learning (RL) and implemented core algorithms (Q-learning, DQN, DDPG, PPO) in PyTorch

Publications

Conferences [C]

[C2] Joonkyung Kim, Sangjin Park, Wonjong Lee, Woojun Kim, Nakju Doh, and Changjoo Nam, "Escaping Local Minima: Hybrid Artificial Potential Field with Wall-Follower for Decentralized Multi-Robot Navigation," *IEEE Int. Conf. on Robotics and Automation (ICRA)*, 2025.
[Paper], [Video]

[C1] Joonkyung Kim, and Changjoo Nam. "Room for me?: Mobile Navigation for Entering a Confined Space Using Deep Reinforcement Learning," *Int. Conf. on Ubiquitous Robots (UR)*, IEEE, 2023.
[Paper], [Video]

Preprints [P]

[P2] Wonjong Lee, Joonyeol Sim, Joonkyung Kim, Siwon Jo, Wenhao Luo, and Changjoo Nam, "Merry-Go-Round: Safe Control of Decentralized Multi-Robot Systems with Deadlock Prevention," *Under review*, 2025.
[Paper], [Project page]

[P1] Joonyeol Sim, Joonkyung Kim, and Changjoo Nam, "Safe Interval RRT* for Scalable Multi-Robot Path Planning in Continuous Space," *Under revision*, 2024.
[Paper], [Video]

Scholarships & Grants

AI Intensive Program at Carnegie Mellon University
Funded by the South Korean government (IITP, Ministry of Science and ICT) *Aug. 2024 – Feb. 2025*

Sogang Scholarship
Funded by Sogang University (graduate program) *Mar. 2023 – Present*

Selected Courseworks

- [CMU | 11-785] *Introduction to Deep Learning* (site) Fall 2024
- [CMU | 11-775] *Large Scale Multimedia Analysis* *Fall 2024*
- [CMU | IITP] *Natural Language Processing* *Fall 2024*
- [SGU | EEE6600] *Intelligent Robotics System* *Spring 2024*
- [SGU | AIE6214] *Applied Linear Algebra* *Fall 2023*
- [SGU | EEE6557] *Reinforcement Learning* *Spring 2023*
- [SGU | EEE6431] *Neural Networks* *Spring 2023*
- [SGU | EEE6470] *Optimization Theory* *Spring 2023*
- [SGU | EEE5477] *Pattern Recognition* *Fall 2022*

Experiences

Reviews
- Conference: *ICRA* (2025), *IROS* (2025)

Teaching Assistant
- [SGU | EEE3141] *Introduction to Control Systems* *Spring 2024*

Military Service Donghae, South Korea
- Republic of Korea Army (ROKA) - Coastal Security Operations *Oct. 2018 – May. 2020*

Technical Skills

Programming Languages: Python, C, MATLAB
Tools & Frameworks: PyTorch, Gymnasium(Gym), PyBullet, Isaac Sim, ROS2