Joonkyung Kim

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Education

Texas A&M University   College Station, United States
- Ph.D. student in Computer Science and Engineering, (Advisor: Yiwei Lyu)   *Aug. 2025 – Current*

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

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

Research Experience

AI Robotics Lab, Sogang University   Seoul, South Korea
Graduate Researcher, Undergraduate Intern   *Sep. 2022 – Aug. 2025*

- Developed a safety-enhancing framework for visual navigation foundation models without fine-tuning (in collaboration with Advanced Agent-Robotics Technology Lab, Carnegie Mellon University) [Project page]
- Developed simulation environments (PyBullet, Isaac Sim) and real-robot systems (ROS2, TurtleBot4) for multi-robot navigation, focusing on safety and conflict resolution [Video1], [Video2], [Video3]
- Developed DRL-based navigation method for mobile robots in confined spaces with randomly placed obstacles [Video]
- Contributed to Pick-and-Place project using a mobile manipulator, gaining experience with the ROS Navigation Stack [Video]

Publication

CONFERENCE [C]

[C4] 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," *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, 2025., [Project page]

[C3] Joonkyung Kim[†], Joonyeol Sim[†], Woojun Kim, Katia Sycara, and Changjoo Nam[*], "Enhancing Safety of Visual Navigation through Collision Avoidance via Repulsive Estimation," *Conference on Robot Learning (CoRL)*, 2025. ([†]Equal contribution) [Project page]

[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]

PREPRINT [P]

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

Scholarship & Grant

AI Intensive Program at Carnegie Mellon University
Fully 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 – Aug. 2025*

Selected Coursework

- [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*

Other Experience

Reviewer
- Conference: *ICRA* (2025), *IROS* (2025), *CoRL* (2025)

Teaching Assistant   Sogang University, South Korea
- [EEE3141] *Introduction to Control Systems*   *Spring 2024*

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

Technical Skill

Programming Language: Python, C, MATLAB
Tool & Framework: PyTorch, PyBullet, Isaac Sim, ROS2