Hogyun **Kim**

Who Wants to Enable Knowledge-Driven Task Planning for Multi-Robot Systems

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Education

Inha University — *Incheon, S.Korea*

M.S. - Ph.D. Integrated in Electrical and Computer Engineering — *Mar. 2023 - Current*

- Advisor: Younggun Cho

Inha University — *Incheon, S.Korea*

B.S. in Naval Architecture and Ocean Engineering — *Mar. 2017 - Feb. 2023*

- Minor: Information and Communication Engineering
- Got an Inha Naval Architecture and Ocean Engineering Alumni Association Scholarship which is given to promising students in NOE Dept.

Work Experience

Spatial AI and Robotics Lab — *Incheon, S.Korea*

Undergraduate Researcher (Internship) — *Oct. 2021 - Feb. 2023*

- Advisor: Younggun Cho

Research Interest

Multi-Robot Systems with Collaborative Intelligence

Robot Autonomy

- Multi-Robot SLAM, Seamless Communication, Knowledge Mapping, Knowledge Sharing, Multi-Robot Exploration, Field Robotics

Multi-Robot Interaction

Robot Interaction

- Manipulation, Mobile Manipulation, Task and Motion Planning, Multi-Robot Interaction, Whole-Body Control, Human-Robot Interaction

Publications

International Journal

SKiD-SLAM: Robust, Lightweight, and Distributed Multi-Robot LiDAR SLAM in Resource-Constrained Field Environments: Dataset, Challenges, and Lessons Learned

IEEE Transactions on Field Robotics **(T-FR) (Under review)** — *2026*

- **Hogyun Kim**, Juwon Kim, Dongjin Cho, Jiwon Choi, Geonmo Yang, Seokhwan Jeong, Jiyun Lee, Miryeong Park, Jungwoo Lee, Hyungtae Lim (†), and Younggun Cho (†)
- (†) Corresponding authors.

Commerge: Communication-Efficient, Robust and Fast LiDAR Map Merging Framework for Multi-robot Coordination in Resource-constrained Scenarios

International Journal of Robotics Research **(IJRR) (Under review)** — *2026*

- **Hogyun Kim**, Jiwon Choi, Juwon Kim, Geonmo Yang, Seokhwan Jeong, Hyungtae Lim (†), and Younggun Cho (†)
- (†) Corresponding authors.

Uni-Mapper: Unified Mapping Framework for Multi-modal LiDARs in Complex and Dynamic Environments

IEEE Transactions on Intelligent Vehicles **(T-IV)** — *Jul. 2025*

- Gilhwan Kang, **Hogyun Kim**, Byunghee Choi, Seokhwan Jeong, Young-Sik Shin, and Younggun Cho

ReFeree: Radar-Based Lightweight and Robust Localization Using Feature and Free space — *Atlanta, USA*

IEEE Robotics and Automation Letters **(RA-L) with ICRA** — *Oct. 2024*

- **Hogyun Kim*** Byunghee Choi*, Euncheol Choi, and Younggun Cho
- (*) Equally contributed.

Narrowing your FOV with SOLiD: Spatially Organized and Lightweight Global Descriptor for FOV-constrained LiDAR Place Recognition — *Atlanta, USA*

IEEE Robotics and Automation Letters **(RA-L) with ICRA** — *Aug. 2024*

- **Hogyun Kim**, Jiwon Choi, Taehu Sim, Giseop Kim, and Younggun Cho

DiTer: Diverse Terrain and Multi-Modal Dataset for Field Robot Navigation in Outdoor Environments

IEEE Sensors Letters — *Jan. 2024*

- Seokhwan Jeong*, **Hogyun Kim***, Younggun Cho
- (*) Equally contributed.

International Conference

KISS-IMU: Self-supervised Inertial Odometry with Motion-balanced Learning and Uncertainty-aware Inference — *Vienna, Austria*

IEEE International Conference on Robotics and Automation **(ICRA)** (Accepted. To appear.) — *2026*

- Jiwon Choi, **Hogyun Kim**, Geonmo Yang, Juhui Lee, and Younggun Cho

MARSCalib: Multi-robot, Automatic, Robust, Spherical Target-based Extrinsic Calibration in Field and Extraterrestrial Environments — *Hangzhou, China*

IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS)** — *2025*

- Seokhwan Jeong, **Hogyun Kim**, and Younggun Cho

DiTer++: Diverse Terrain and Multi-modal Dataset for Multi-Robot SLAM in Multi-session Environments — *Atlanta, USA*

IEEE International Conference on Robotics and Automation **(ICRA)** — *2025*

- Juwon Kim, **Hogyun Kim**, Seokhwan Jeong, Youngsik Shin, and Younggun Cho

PoLaRIS Dataset: A Maritime Object Detection and Tracking Dataset in Pohang Canal — *Atlanta, USA*

IEEE International Conference on Robotics and Automation **(ICRA)** — *2025*

- Jiwon Choi, Dongjin Cho, Gihyeon Lee, **Hogyun Kim**, Geonmo Yang, Joowan Kim, and Younggun Cho

Robust Imaging Sonar-based Place Recognition and Localization in Underwater Environments — *London, England*

IEEE International Conference on Robotics and Automation **(ICRA)** — *May. 2023*

- **Hogyun Kim**, Gilhwan Kang, Seokhwan Jeong, Seungjun Ma, Younggun Cho

Preprint

SKiD-SLAM: Robust, Lightweight, and Distributed Multi-Robot LiDAR SLAM in Resource-Constrained Field Environments

arXiv, preprint (ICRA Workshop on Field Robotics) — *May. 2025*

- **Hogyun Kim**, Jiwon Choi, Juwon Kim, GeonmoYang, Dongjin Cho, Hyungtae Lim (†), and Younggun Cho (†)
- (†) Corresponding authors.

ReFeree: Radar-based efficient global descriptor using a Feature and Free space for Place Recognition

arXiv, preprint (ICRA Workshop on Radar in Robotics) — *May. 2024*

- Byunghee Choi (*), **Hogyun Kim** (*), Younggun Cho
- (*) Equally contributed.

Domestic Journal

Spherical Target-based LiDAR-Camera Extrinsic Calibration for Multi-Robot System in Field Environments

Journal of Korean Institute of Information Technology — *Aug. 2025*

- Seokhwan Jeong, **Hogyun Kim**, Juwon Kim, and Younggun Cho

Study on Efficient Multi-floor Navigation Using a Visual Marker and Floor Plan Map

Journal of Institute of Control, Robotics and Systems — *Jan. 2024*

- Jiwon Choi, Taehu Sim, Gihyeon Lee, Jaeyong Lee, Gilhwan Kang, **Hogyun Kim**, Younggun Cho

Honors & Awards

International

2025 **Spotlight Talk**, ICRA 2025 3rd Workshop on Field Robotics — *Atlanta, USA*

2024 **Best Research Award (3rd prize)**, ICRA 2024 3rd Workshop on Future of Construction: Lifelong Learning Robots in Changing Construction Sites — *Yokohama, Japan*

Domestic

2026 **Samsung HumanTech Paper Award (Silver Prize)**, Samsung Electronics — *Seoul, S.Korea*

2026 **Graduate Research Award**, Inha University — *Incheon, S.Korea*

2026 **Research Presentation Award**, Inha University — *Incheon, S.Korea*

2025 **Ph.D candidate Research Fellowship**, National Research Foundation of Korea (NRF) — *Dajeon, S.Korea*

2025 **Excellent Research Award**, Korean Institute of ITS Conference — *Jeju, S.Korea*

2025 **Outstanding Research Award (Most-Applied Patent)**, Inha University — *Incheon, S.Korea*

2025 **Outstanding Research Award (Excellence of Journal Publication)**, Inha University — *Incheon, S.Korea*

2021 **Participation Award**, Autonomous Car Competition for College Student — *Hwaseong, S.Korea*

2021 **Control prize in Design/Making**, Korea Autonomous Boat Competition (KABOAT) — *Changwon, S.Korea*

2021 **6th prize**, Korea Autonomous Boat Competition (KABOAT) — *Changwon, S.Korea*

2021 **Vertically Integrated Project Award (1st Prize)**, Inha University — *Incheon, S.Korea*

2020 **Vertically Integrated Project Award (1st Prize)**, Inha University — *Incheon, S.Korea*

2020 **1st Prize in Autopilot**, Korea Autonomous Boat Competition (KABOAT) — *Changwon, S.Korea*

2020 **4th Prize**, Korea Autonomous Boat Competition (KABOAT) — *Changwon, S.Korea*

Presentation

Ranging-sensor-based Lightweight Place Description for Distributed SLAM — *Prague, Czech Republic*

IEEE RAS Summer School on Multi-Robot Systems — *July. 2024*

- **Hogyun Kim** and Younggun Cho

Radar-based place recognition using a robust and lightweight global descriptor for limited environment multi-robot cooperation — *Daejeon, South Korea*

Institute of Control, Robotics, and Systems (ICROS) — *July. 2024*

- **Hogyun Kim**, Byunghee Choi, and Younggun Cho

ReFeree: Radar-based efficient global descriptor using a Feature and Free space for Place Recognition — *Yokohama, Japan*

IEEE International Conference on Robotics and Automation (ICRA) Workshop on Radar in Robotics — *May. 2024*

- Byunghee Choi*, **Hogyun Kim***, and Younggun Cho
- (*) Equally contributed.

Robust Sonar-based Place Recognition in Underwater Environments — *Kyoto, S.Korea*

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Late-breaking — *Nov. 2022*

- **Hogyun Kim** and Younggun Cho

Projects

Stereo Object Localization in Maritime — *Dajeon, Korea*

Samsung Heavy Industry

Awesome LiDAR Place Recognition [GitHub] — *Stars: 200*

Persoanl

Patent

International

2025 **Lightweight Robot Localization for LiDARs with Limited FOV** — *Incheon, S.Korea*

2025 **Radar-based Lightweight Robot Localization** — *Incheon, S.Korea*

Domestic

2024 **Lightweight Robot Localization for LiDARs with Limited FOV** — *Incheon, S.Korea*

2024 **Radar-based Lightweight Robot Localization** — *Incheon, S.Korea*

2024 **Sensor Extrinsic Calibration in Limited Environments** — *Incheon, S.Korea*

2023 **A Method on the Efficient Multi-Floor Navigation Using Visual Marker and Floor Plan Map** — *Incheon, S.Korea*

Academic Activities

Reviewer

- IEEE Journal of Ocean Engineering **(JOE 2025)**
- IEEE Robotics and Automation Letters **(RA-L 2024, 2025, 2026)**
- The International Journal of Robotics Research **(IJRR 2025)**
- IEEE International Conference on Robotics and Automation **(ICRA 2026)**
- IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS 2025)**

Training

- Hands-on training on the SPARUS II AUV platform at IQUA Robotics, Girona, Spain **(2025)**
- IEEE RAS Summer School on Multi-Robot Systems, Prague, Czech Republic **(2024)**

Skills

Python, C++, Matlab, ROS, Latex, Docker