

Gunhee Shin

PH.D. STUDENT, URBAN ROBOTICS LAB, KAIST

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Education

Ph.D. Student, Electrical Engineering — KAIST

2025 – Present

- Advisor: Prof. Hyun Myung — Urban Robotics Lab

M.S., Electrical Engineering — KAIST

2023 – 2025

- GPA: 3.7/4.3
- Advisor: Prof. Hyun Myung — Urban Robotics Lab
- Thesis: "Uncertainty-aware Multiple LiDAR-Inertial Odometry for Outdoor Mobile Robots"

B.S., Electrical Engineering — INHA UNIVERSITY

2017 – 2023

- GPA: 3.9/4.5
- Thesis: "A Fast Correspondence Matching for Iterative Closest Point Algorithm"

Publications

JOURNAL ARTICLES

1. **G. Shin**, J. Choi, and K. Kim†. "A Fast Correspondence Matching for Iterative Closest Point Algorithm." *J. Korea Robot. Soc.*, vol. 17, no. 3, pp. 373–380, 2022.

CONFERENCE PAPERS

1. **G. Shin**, Y. Kim, C. Lee, W. Kim, M. Lee, S. Han, J. Woo, H. Chin, M. Park, and H. Myung†. "Online Target-less Radar-LiDAR-Camera Extrinsic Calibration via Joint Optimization." in *Proc. Int. Conf. Control, Automat. Syst.*, 2026.
2. **G. Shin**, S. Lee, J. Kong, Y. Seo, and H. Myung†. "SE(3)-LIO: Smooth IMU Propagation With Jointly Distributed Poses on SE(3) Manifold for Accurate and Robust LiDAR-Inertial Odometry." in *Proc. IEEE Int. Conf. Robot. Automat.*, 2026.
3. H. Lim, D. Kim, **G. Shin**, J. Shi, I. Vizzo, H. Myung†, J. Park†, and L. Carlone†. "KISS-Matcher: Fast and Robust Point Cloud Registration Revisited." in *Proc. IEEE Int. Conf. Robot. Automat.*, 2025.
4. **G. Shin**, S. Lee, M. Oh, D. Lee, J. Lee, Y. Seo, and H. Myung†. "NM-LIO: Multiple LiDAR-Inertial Odometry Addressing LiDAR Measurement Noise Discrepancy." in *Proc. Int. Conf. Robot. Intell. Tech. Appl.*, 2024.
5. M. Oh, **G. Shin**, S. Jang, S. Lee, D. Lee, W. Song, B. Yu, H. Lim, J. Lee, and H. Myung†. "B-TMS: Bayesian Traversable Terrain Modeling and Segmentation Across 3D LiDAR Scans and Maps for Enhanced Off-Road Navigation." in *Proc. IEEE Intell. Veh. Symp. Workshops*, 2024.
6. H. Lim, K. Han, **G. Shin**, G. Kim, S. Hong, and H. Myung†. "ORORA: Outlier-Robust Radar Odometry." in *Proc. IEEE Int. Conf. Robot. Automat.*, 2023.

† Corresponding author

Patents

1. H. Myung, **G. Shin**, S. Lee, and J. Kong. "LiDAR and Inertial-Based Position and Pose Estimation System and Method." Korean Patent Application No. 10-2026-0080491, May 2026.

Open-Source Software

SE(3)-LIO — github.com/url-kaist/se3-lio

2026

SE(3)-LIVOM — github.com/url-kaist/se3-livom-comfort

2026

Honors & Awards

Winner, COMFORT Localization Challenge — TEAM LEAD · IROS 2026, PITTSBURGH, USA

2026

- Challenge: Estimate the trajectory of an ANYmal legged robot in six field scenes of the GrandTour dataset.
- Role: Built the whole system: LiDAR-visual-inertial odometry and online drift correction.

Winner, Nothing Stands Still Challenge — CVPR 2026, DENVER, USA [2026](#)

- Challenge: Align scans of a building site taken at different construction stages into one map.
- Role: Graph optimization that aligns the scans across stages.

2nd Place, Quadruped Robot Challenge — ICRA 2025, ATLANTA, USA [2025](#)

- Challenge: Legged robots cross rough-terrain lanes and complete inspection and manipulation tasks.
- Role: Pose estimation for onboard navigation.

2nd Place, Quadruped Robot Challenge (Autonomous Track) — ICRA 2024, YOKOHAMA, JAPAN [2024](#)

- Challenge: Legged robots run as many laps of a course as they can in 10 minutes, fully autonomously.
- Role: Pose estimation for onboard navigation.

Winner, HILTI SLAM Challenge (LiDAR Single-Session) — ICRA 2023, LONDON, UK [2023](#)

- Challenge: Estimate accurate trajectories from data recorded on construction sites, in narrow rooms, and in the dark.
- Role: LiDAR-inertial odometry and merging of multiple sessions.

Projects

GNSS-Free Visual-Inertial Navigation for Drones — HANWHA AEROSPACE, KOREA [2026 – Present](#)

- Role: Fused visual-inertial odometry with satellite-image localization.

Online Radar-LiDAR-Camera Calibration for Autonomous Vehicles — PROJECT LEAD · LG INNOTEK, KOREA [2025 – Present](#)

- Role: Led development of online calibration between radar, LiDAR, and camera without targets.

Off-Road Autonomous Driving in Unstructured Terrain — HANWHA AEROSPACE, KOREA [2023 – 2026](#)

- Role: Built LiDAR-inertial odometry (SE(3)-LIO) and fused it with satellite-image localization for driving without GNSS.

Mobility Intelligence Software for Legged Robots — KEIT, KOREA [2022 – 2026](#)

- Role: Set up the multi-LiDAR sensor system and built pose estimation for onboard navigation.

Semantic SLAM for Spatial AI — LG ELECTRONICS, KOREA [2023](#)

- Role: Ran 3D scene graph SLAM (Hydra) on real sensor data and added object-level loop closing.