Robotics Department
University of Michigan
Ann Arbor, Michigan 48109

jaehos@umich.edu
Github
Google Scholar

Jaeho Shin

EDUCATION

University of Michigan *Aug. 2025- present*
Ph.D. in Robotics
Advised by Dr. Yulun Tian and Dr. Maani Ghaffari

Seoul National University (SNU) *Mar. 2023 - Aug. 2025*
M.S. in Mechanical Engineering
Advised by Dr. Ayoung Kim

Seoul National University (SNU) *Mar. 2017 - Feb. 2023*
B.S. in Mechanical Engineering (ME)
Graduated *Summa cum laude*

FIELD OF INTEREST

Visual simultaneous localization and mapping (SLAM), Applied mathematics, Differential geometry, Computer vision, Mobile robotics, Robotic perception

POSITIONS

Graduate Student Instructor *Aug. 2025 - present*
Scalable Spatial Intelligence Lab
Robotics, University of Michigan

Graduate Student Research Assistant *Mar. 2023 - Aug. 2025*
RPM Robotics Lab
Mechanical Engineering (ME), Seoul National University (SNU)

Graduate Student Teaching Assistant *Spring, 2024*
Mechanical System Design and Robot Programming
Mechanical Engineering (ME), Seoul National University (SNU)

TEACHING & ADVISING

Undergraduate Research Opportunities Program (UROP) Mentor *Summer 2023*
RPM Robotics Lab

Mentored undergraduate students in designing and implementing a multi-camera system on an unmanned ground vehicle (UGV) to facilitate indoor localization and mapping.

PROJECTS

Digital Twin Platform for Smart Construction and Automation 2023 - 2025
Graduate Student Research Assistant *RPM Robotics Lab*

· Developed SLAM algorithms and UGV hardware system with thermal cameras and LiDAR for construction site inspection.

Multi-Camera Based Robot Localization Project 2023 - 2024
Graduate Student Research Assistant *RPM Robotics Lab*

· Developed an extrinsic calibration algorithm for cameras with non-overlapping fields of view using ArUco markers.

PUBLICATIONS

International Journal

1. Jeongyun Kim, Myung-Hwan Jeon, Sangwoo Jung, Wooseong Yang, Minwoo Jung, Jaeho Shin, and Ayoung Kim. Transpose: Large-scale multispectral dataset for transparent object. *International Journal of Robotics Research*, 43(6):731–738, 2024
2. Seungsang Yun, Jaeho Shin, Jaekwang Cha, and Ayoung Kim. The more the better? confidence-driven residual weighting and depth fusion for multi-rgb-d inertial odometry. *IEEE Robotics and Automation Letters (RA-L)*, 2025. (Submitted.)

International Conference Proceedings

1. Jaeho Shin, Seungsang Yun, and Ayoung Kim. PeLiCal : Targetless extrinsic calibration via penetrating lines for RGB-D cameras with limited co-visibility. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Yokohama, May. 2024
2. Chaehyeon Song, Jaeho Shin, Myung-Hwan Jeon, Jongwoo Lim, and Ayoung Kim. Unbiased estimator for distorted conic in camera calibration. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) highlight*, Seattle, June. 2024
3. Jaeho Shin, Hyeonjae Gil, Junwoo Jang, Maani Ghaffari, and Ayoung Kim. Registration beyond points: General affine subspace alignment via geodesic distance on Grassmann manifold. In *IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025. (Submitted.)

Domestic Journal (KR)

1. Jaeho Shin, Myung-Hwan Jeon, Ayoung Kim. Infrared visual inertial odometry via Gaussian mixture model approximation of thermal image histogram. *The Journal of Korea Robotics Society*, Vol. 18, No. 3, pp. 260-270, 2023

PATENTS

International Patents (US)

- Ayoung Kim, Chaehyeon Song, Jongwoo Lim, Myung-Hwan Jeon, and Jaeho Shin, Method and device for camera calibration algorithm using unbiased conic estimator considering distortion, *J53204.0001* (2024-07-16).

Domestic Patents (KR)

- Ayoung Kim, Chaehyeon Song, Jongwoo Lim, Myung-Hwan Jeon, and Jaeho Shin, Method and device of camera calibration algorithm using unbiased estimator of distorted conic, *102040032509* (2024-03-07).
- Ayoung Kim, Jaeho Shin, and SeungSang Yun, Device and method for calibrating extrinsic parameter, *1020240093479* (2024-07-17).

SERVICES

Reviewer

- IEEE Transactions on Robotics (T-RO).
- IEEE Robotics and Automation Letters (RA-L).
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- IEEE International Conference on Robotics and Automation (ICRA).

Revised September 10, 2025