Hyungtae **Lim**

Robotics Researcher · Field Robotics Engineer

Cambridge, MA, USA

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"Towards Pervasive Robotics and Artificial Intelligence"

Summary

A robotics researcher focused on robust perception, state estimation for mobile robots, and lifelong mapping technologies essential for robotic navigation. Studying algorithms that are robust to dynamic objects and outliers, with the goal of achieving generalization in real-world environments. An enthusiast of open-source research, aiming to help others and contribute to the advancement of the robotics community. Currently, a postdoctoral associate at the SPARK Lab at MIT. Previously worked as a postdoctoral fellow at the Urban Robotics Lab at KAIST, Republic of Korea, visiting scholar at StachnissLab, Univ. Bonn in Germany, and research intern at NAVER LABS, Republic of Korea.

Highlights

- IEEE ICRA 2025 Outstanding Reviewer Award (Selected as one of only 5 awardees out of 7,641 reviewers)
- RSS Pioneers 2024 (Out of 202 candidates, only 30 researchers were selected)
- 1st prize again in the HILTI SLAM Challenge'24 in IEEE ICRA
- Published over 20 papers in flagship conferences/journals (e.g., IROS, ICRA, RA-L, RSS, IJRR) during grad school (12 first-author papers)
- 2022 IEEE RA-L Best Paper Award (among 1,100 papers, only 5 papers were selected)
- 1st prize in HILTI SLAM Challenge'23 in IEEE ICRA among 63 international teams
- Received CES'23 innovation award through technology transfer on SLAM for mobile robots (collaborated with HILLS Robotics)
- Visiting scholar of Univ. Bonn, Germany (advisor: Prof. Cyrill Stachniss)
- In 2022, served as a SLAM part outside expert, CTO division of LG Electronics, Republic of Korea
- 2nd cash prize in HILTI SLAM Challenge'22 in IEEE ICRA (in total, 4th place)
- Research intern in vision/deep learning team at NAVER LABS, Republic of Korea
- 1st prize in Hitachi-LG Data Storage LiDAR application competition, Republic of Korea

Field of Interest

My research interests include, but are not confined to:

- SLAM using LiDAR, camera, or radar sensors
- Scene graph-based mapping
- Robust 3D point cloud registration
- Mobile robotics including autonomous vehicles and quadruped robots
- Deep learning-based approaches that aid in perceiving the surroundings from the robot's perspective
- Geometry-based instance segmentation and perception for traversability estimation
- Localization including visual localization, including visual place recognition
- Static map building and moving object segmentation
- Robust visual(-inertial) and LiDAR(-inertial) odometry
- Lifelong SLAM and continual mapping for long-term autonomy
- Spatio-temporal scene understanding
- Multi-session and multi-agent SLAM
- Uncertainty-aware state estimation and map maintenance

Education

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, Republic of Korea*

Ph.D. in Electrical Engineering and Robotics Program — *Mar. 2020 - Feb. 2023*

- Dissertation: "Robust LiDAR SLAM for Autonomous Vehicles Leveraging Ground Segmentation" [pdf]
- Advised by Prof. Hyun Myung

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, Republic of Korea*

M.S. in Electrical Engineering and Robotics Program — *Mar. 2018 - Feb. 2020*

- Dissertation: "Two-Stage Depth Prediction Using a 2D LiDAR and a Monocular Camera via Deep Learning"
- Advised by Prof. Hyun Myung

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, Republic of Korea*

B.S. in Mechanical Engineering — *Mar. 2013 - Aug. 2018*

- Listed on the Dean's List in Mechanical Engineering, KAIST (GPA 4.23/4.3 for the semester) - Fall 2015

Work Experience (Including Internship)

Postdoctoral Associate

Massachusetts, the U.S.

SPARK Lab, MIT

Apr. 2024 - Current

- Advised by Prof. Luca Carlone.
- Conduct research on multi-robot/-session autonomous mapping algorithms in complex urban environments.
- Guide and supervise graduate and undergraduate students in their research papers and thesis projects.

Postdoctoral Fellow

Daejeon, Republic of Korea

Urban Robotics Lab, KAIST

Mar. 2023 - Mar. 2024

- Advised by Prof. Hyun Myung.
- Conducted research on localization and mapping techniques using LiDAR and vision data, respectively.
- Developed deep learning models for robust perception.
- Guided and supervised graduate and undergraduate students in their research papers and thesis projects.

Outside Expert of the CTO Division of LG Electronics Co. Ltd.

Republic of Korea

LG Electronics Co. Ltd.

Mar. 2022 - Feb. 2023

- Introduced state-of-the-art SLAM technologies and provided insights into future technological directions for mobile robots.
- Delivered a lecture entitled *"Introduction to the latest SLAM technology trends and Semantic SLAM."*

Visiting Scholar

Bonn, Germany

StachnissLab

Nov. 2022 - Feb. 2023

- After defending my dissertation, I visited Prof. Cyrill Stachniss' lab.
- Worked on an improved version of static map building.
- Submitted and had a paper accepted at RSS 2023 titled *ERASOR2*.

Research Intern

Gyeonggi-Do, Republic of Korea

NAVER LABS

Apr. 2022 - Sep. 2022

- Served as a Ph.D. research intern.
- Worked on robust global registration using 3D point cloud data captured by the LiDAR sensor.
- Submitted and accepted a paper to IEEE ICRA 2022.
- Relevant code: `https://github.com/url-kaist/Quatro`.

Research Project Experience

Development of Harmonic-Space Operation Using Seamless Information Sharing Among Large-Scale Heterogeneous UVs

SPARK Lab, MIT

Supported by National Research Foundation, Republic of Korea

Sep. 2024 - Current

- Implemented multi-session LiDAR SLAM
- Studied semantic SLAM for heterogeneous robot platforms
- Keywords: 3D semantic mapping, Scene graph-based SLAM

Research on Certifiable Perception and Long-Term Metric-Semantic Mapping for Autonomous Vehicles

Postdoctoral Fellowship Program

Supported by National Research Foundation, Republic of Korea

Sep. 2024 - Sep. 2025

- Studied long-term metric-semantic mapping for mobile robots or autonomous vehicles
- Keywords: Metric-semantic mapping, Semantic SLAM

Development of Scene Graph-Based Multi-Robot Multi-Session SLAM

SPARK Lab, MIT

Supported by DCIST & DevCom

Apr. 2024 - Current

- Implemented scene graph-based SLAM methods based on Hydra
- Ran semantic SLAM and enhanced the performance in our real-world campus scenes
- Keywords: 3D semantic mapping, Semantic SLAM

Development of Semantic SLAM for Spatial AI

Urban Robotics Lab., KAIST

Supported by LG Electronics

Apr. 2023 - Dec. 2023

- Implemented deep learning-aided SLAM methods based on Hydra
- Ran semantic SLAM and enhanced the performance in our real-world campus scenes
- Keywords: 3D semantic mapping, Semantic SLAM

Development of Artificial Intelligence Robot Autonomous Navigation Technology for Agile Movement in Crowded Space

Urban Robotics Lab., KAIST

Supported by the Ministry of Trade, Industry & Energy (MOTIE), Republic of Korea

Mar. 2020 - June 2023

- Was in charge of dynamic object detection in order to generate static maps and perform moving-object-robust SLAM in dynamic environments
- Keywords: SLAM, 3D LiDAR, Static Map Building, OpenCV, C++, ROS

Study of Semantic SLAM Towards Spatial AI Technologies *Urban Robotics Lab., KAIST*

Supported by LG Electronics *Mar. 2022 - Dec. 2022*

- Studied various deep learning-aided SLAM methods, such as Kimera and Hydra
- Run semantic SLAM in our real-world data to check the feasibility
- Keywords: 3D semantic mapping, Semantic SLAM

Deep Learning-Based Depth Prediction Using a Mono Camera and 2D LiDAR Sensor *Urban Robotics Lab., KAIST*

Supported by Hyundai Kefico *Mar. 2022 - Nov. 2022*

- Was in charge of the development of deep learning-based depth prediction
- Studied various calibration methods (2D LiDAR-to-camera, 3D LiDAR-to-IMU, camera-to-IMU)
- Ran deep learning models on NVIDIA Xavier
- Keywords: Real-time deep learning, Depth prediction, Calibration, PyTorch, OpenCV, C++, ROS

A Study on the Visual Place Recognition in Multiple Photos *Urban Robotics Lab., KAIST*

Supported by KAIST Institute for Security Convergence Research *Mar. 2020 - Dec. 2020*

- Studied visual place recognition application. Struggled to improve the performance of the SOTA deep learning-based VPR approaches
- Keywords: Visual place recognition, Deep learning, Semantic segmentation, Inpainting, Python, PyTorch

Development of Robot Intelligence Technology for Mobility with Learning Capability Toward Robust and Seamless Indoor and Outdoor Autonomous Navigation *Urban Robotics Lab., KAIST*

Supported by the Ministry of Trade, Industry & Energy (MOTIE) *Mar. 2020 - Sep. 2020*

- Developed SLAM algorithm applied to mobile robots
- Was in charge of SLAM, static map building in low-dynamic environments, and movable area prediction
- Keywords: SLAM, 3D LiDAR, Registration, Static map building, Mobile robots, C++, ROS

Indoor Navigation of Mobile Robots using Deep Learning-based Object Recognition *Urban Robotics Lab., KAIST*

Supported by Samsung Electronics Co., Ltd. *Jan. 2019 - Sep. 2019*

- Developed SLAM and perception algorithms applied to robot cleaners for achieving robust navigation in indoor environments
- Was in charge of depth prediction using a 2D LiDAR sensor and a monocular camera for collision avoidance of mobile robots via deep learning
- Keywords: 2D LiDAR, Sensor Fusion, Deep Learning, Mobile Robots, PyTorch, ROS

IITP Artificial Intelligence R&D Grand Challenge: Track 4, Intelligent Control *Urban Robotics Lab., KAIST*

Supported by IITP, which is a government-affiliated organization *Jan. 2019 - Jun. 2019*

- Was in charge of the task of a drone passing through windows
- Implemented RGB-D camera-based path planning&following. Participated in applying VIO to estimate the odometry of UAV
- Keywords: VIO, Path planning and following, Projective geometry, OpenCV, ROS

Machine Learning-Based Classification of Small Object Captured by Unmanned Aerial Vehicle *Urban Robotics Lab., KAIST*

Outsourced by Pixoneer Geomatics and Agency for Defense Development *Jan. 2018 - Dec. 2019*

- Developed both SVM-based and Deep Learning-based classification algorithms
- Implemented HOG-LBP for input to SVM and engaged in designing novel Deep Learning architecture.
- Keywords: Deep Learning, SVM, HOG-LBP, Classification, Python, PyTorch

Range-Only SLAM in Complex Disaster Situation *Urban Robotics Lab., KAIST*

Supported by Ministry of Trade, Industry, and Energy *Jan. 2018 - Dec. 2018*

- Implemented Monte Carlo localization (MCL) using range measurements by ultra-wideband (UWB) sensors for UAV from scratch single-handed
- Struggled to cover None-line-of-sight (NLOS) issues.
- Keywords: MCL, Beacon-based localization, UWB sensors, NLOS, ROS

Publications

Underline denotes co-first authors or co-corresponding authors

International Journal

1. Changki Sung, **Hyungtae Lim**, Wanhee Kim, and Hyun Myung, "Contextrast++: Robust Multi-Scale Contextual Contrastive Learning for Semantic Segmentation," *IEEE Trans. Pattern Anal. Mach. Intell. (T-PAMI)*, 2025. Under review.
2. **Hyungtae Lim**, Daebeom Kim, and Hyun Myung, "Multi-Mapcher: Loop Closure Detection-Free Heterogeneous LiDAR Multi-Session SLAM Leveraging Outlier-Robust Registration for Autonomous Vehicles," *IEEE Trans. Intell. Veh. (T-IV)*, 2025. Under review.
3. I Nahrendra, Byeongho Yu, Minho Oh, Dongkyu Lee, Seunghyun Lee, Hyeonwoo Lee, **Hyungtae Lim**, and Hyun Myung, "Obstacle-Aware Quadrupedal Locomotion With Resilient Multi-Modal Reinforcement Learning," *IEEE Trans. Robot. (T-RO)*, 2025. Under review.

4. Kevin Christiansen Marsim, Minho Oh, Byeongho Yu, Seungjae Lee, I Made Aswin Nahrendra, **Hyungtae Lim**, and Hyun Myung, "LVI-Q: Robust LiDAR-Visual-Inertial-Kinematic Odometry for Quadruped Robots Using Tightly-Coupled and Efficient Alternating Optimization," *IEEE Robot. Automat. Lett. (RA-L)*, 2025. Accepted. To appear.
5. Daehan Lee, **Hyungtae Lim**, and Soohee Han, "GenZ-ICP: Generalizable and Degeneracy-Robust LiDAR Odometry Using an Adaptive Weighting," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 10, no. 1, pp. 152–159, Nov. 14, 2024.
6. Seungwon Song, **Hyungtae Lim**, Alex Junho Lee, and Hyun Myung, "DynaVINS++: Robust Visual-Inertial State Estimator in Dynamic Environments by Adaptive Truncated Least Squares and Stable State Recovery," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 9, no. 10, pp. 9127–9134, Sep. 6, 2024.
7. DongKi Noh, **Hyungtae Lim**, Gyuho Eoh, Duckyu Choi, Jeong-Sik Choi, Hyunjun Lim, Seung-Min Baek, and Hyun Myung, "CLOi-Mapper: Consistent, Lightweight, Robust, and Incremental Mapper With Embedded Systems for Commercial Robot Services," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 9, no. 9, pp. 7541–7548, Jul. 15, 2024.
8. **Hyungtae Lim**, Minho Oh, Seungjae Lee, Seunguk Ahn, and Hyun Myung, "Similar but Different: A Survey of Ground Segmentation and Traversability Estimation for Terrestrial Robots," *Int. J. Control, Automat. Syst. (IJCAS)*, vol. 22, pp. 347–359, Feb. 1, 2024.
9. **Hyungtae Lim**, Beomsoo Kim, Daebeom Kim, Eungchang Mason Lee, and Hyun Myung, "Quatro++: Robust Global Registration Exploiting Ground Segmentation for Loop Closing in LiDAR SLAM," *Int. J. Robot. Res. (IJRR)*, vol. 43, no. 5, pp. 685–715, Nov. 2, 2023.
10. Alex Junho Lee, Seungwon Song, **Hyungtae Lim**, Wooju Lee, and Hyun Myung, "$(LC)^2$: LiDAR-Camera Loop Constraints For Cross-Modal Place Recognition," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 8, no. 6, pp. 3589–3596, Apr. 20, 2023.
11. DongKi Noh, Changki Sung, Teayoung Uhm, Wooju Lee, **Hyungtae Lim**, Jaeseok Choi, Kyuewang Lee, Dasol Hong, Daeho Um, Inseop Chung, Hochul Shin, MinJung Kim, Hyoung-Rock Kim, SeungMin Baek, and Hyun Myung, "X-MAS: Extremely Large-Scale Multi-Modal Sensor Dataset for Outdoor Surveillance in Real Environments," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 8, no. 2, pp. 1093–1100, Jan. 12, 2023.
12. Seungwon Song, **Hyungtae Lim**, Alex Junho Lee, and Hyun Myung, "DynaVINS: A Visual-Inertial SLAM for Dynamic Environments," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 7, no. 4, pp. 11523–11530, Oct. 31, 2022.
13. Minho Oh, Euigon Jung, **Hyungtae Lim**, Wonho Song, Sumin Hu, Eungchang Mason Lee, Junghee Park, Jaekyung Kim, Jangwoo Lee, and Hyun Myung, "TRAVEL: Traversable Ground and Above-Ground Object Segmentation Using Graph Representation of 3D LiDAR Scans," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 7, no. 3, pp. 7255–7262, Jun. 13, 2022. **Won 2022 IEEE RA-L Best Paper Award**.
14. Seungwon Song, **Hyungtae Lim**, and Hyun Myung, "G2P-SLAM: Generalized RGB-D SLAM Framework for Mobile Robots in Low-Dynamic Environments," *IEEE Access*, vol. 10, pp. 21370–21383, Feb. 11, 2022.
15. Changki Sung, Seulgi Jeon, **Hyungtae Lim**, and Hyun Myung, "What If There Was No Revisit? Large-Scale Graph-based SLAM with Traffic Sign Detection in an HD Map Using LiDAR Inertial Odometry," *J. Intell. Serv. Robot.*, pp. 1–10, Nov. 25, 2021.
16. **Hyungtae Lim**, Hanseok Ryu, Matthew Rhudy, Dongjin Lee, Dongjin Jang, Changho Lee, Young-min Park, Wonkeun Youn, and Hyun Myung, "Deep Learning-Aided Synthetic Airspeed Estimation of UAVs for Analytical Redundancy with a Temporal Convolutional Network," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 7, no. 1, pp. 17–24, Oct. 1, 2021.
17. **Hyungtae Lim**, Minho Oh, and Hyun Myung, "Patchwork: Concentric Zone-Based Region-Wise Ground Segmentation With Ground Likelihood Estimation Using a 3D LiDAR Sensor," *IEEE Robot. Automat. Lett. (RA-L) with IROS*, vol. 6, no. 4, pp. 6458–6465, Jun. 28, 2021.
18. Wonkeun Youn, **Hyungtae Lim**, Hyoung Sik Choi, Matthew B. Rhudy, Hyeok Ryu, Sungyug Kim, and Hyun Myung, "State Estimation of HALE UAV With Deep Learning-Aided Virtual AOA/SSA Sensor for Analytical Redundancy," *IEEE Robot. Automat. Lett. (RA-L)*, vol. 6, no. 3, pp. 5276–5283, Apr. 19, 2021.
19. **Hyungtae Lim**, Sungwon Hwang, and Hyun Myung, "ERASOR: Egocentric Ratio of Pseudo Occupancy-Based Dynamic Object Removal for Static 3D Point Cloud Map Building," *IEEE Robot. Automat. Lett. (RA-L) with ICRA*, vol. 6, no. 2, pp. 2272–2279, Feb. 23, 2021.

International Conference

1. Junho Choi, Kihwan Ryoo, Jeewon Kim, Taeyun Kim, Eungchang Lee, Myeongwoo Jeong, Kevin Christiansen Marsim, **Hyungtae Lim**, and Hyun Myung, "SaWa-ML: Structure-Aware Pose Correction and Weight Adaptation-Based Robust Multi-Robot Localization," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, 2025. Accepted. To appear.
2. Dominic Maggio, **Hyungtae Lim**, and Luca Carlone, "VGGT-SLAM: Dense RGB SLAM Optimized on the SL(4) Manifold," in *Proc. Neural Information Processing Systems (NeurIPS)*, 2025. Accepted. To appear.
3. Minkyun Seo, **Hyungtae Lim**, Kanghee Lee, Luca Carlone, and Jaesik Park, "BUFFER-X: Towards Zero-Shot Point Cloud Registration in Diverse Scenes," in *Proc. IEEE/CVF Int. Conf. Comput. Vis. (ICCV)*, 2025. Accepted. To appear.
4. **Hyungtae Lim**, Daebeom Kim, Gunhee Shin, Jingnan Shi, Ignacio Vizzo, Hyun Myung, Jaesik Park, and Luca Carlone, "KISS-Matcher: Fast and Robust Point Cloud Registration Revisited," in *Proc. IEEE Int. Conf. Robot. Automat. (ICRA)*, Atlanta, U.S., May 19–23, 2025. Accepted. To appear.
5. Kihwan Ryoo, **Hyungtae Lim**, and Hyun Myung, "MambaGlue: Fast and Robust Local Feature Matching With Mamba," in *Proc. IEEE Int. Conf. Robot. Automat. (ICRA)*, Atlanta, U.S., May 19–23, 2025. Accepted. To appear.
6. **Hyungtae Lim**, Seoyeon Jang, Benedikt Mersch, Jens Behley, Hyun Myung, and Cyrill Stachniss, "HeLiMOS: A Dataset for Moving Object Segmentation in 3D Point Clouds From Heterogeneous LiDAR Sensors," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Abu Dhabi, UAE, Oct. 14–18, 2024.
7. Changki Sung, Wanhee Kim, Jungho An, Wooju Lee, **Hyungtae Lim**, and Hyun Myung, "Contextrast: Contextual Contrastive Learning for Semantic Segmentation," in *Proc. IEEE/CVF Conf. Comput. Vis. Pattern Recognit. (CVPR)*, Seattle, U.S., Jun. 17–21, 2024, pp. 3732–3742.
8. Minho Oh, Gunhee Shin, Seoyeon Jang, Seungjae Lee, Dongkyu Lee, Wonho Song, Byeongho Yu, **Hyungtae Lim**, Jaeyoung Lee, and Hyun 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. (IV)*, Jeju Island, Korea, Republic of, Jun. 2–5, 2024.
9. Wooju Lee, Dasol Hong, **Hyungtae Lim**, and Hyun Myung, "Object-Aware Domain Generalization for Object Detection," in *Annual AAAI Conf. Artif. Intell. (AAAI)*, Vancouver, Canada, Feb. 20–27, 2024, pp. 2946–2955.
10. Seoyeon Jang, Minho Oh, Byeongho Yu, I Made Aswin Nahrendra, Seungjae Lee, **Hyungtae Lim**, and Hyun Myung, "TOSS: Real-time Tracking and Moving Object Segmentation for Static Scene Mapping," in *Proc. Int. Conf. Robot Intell. Tech. Applications (RiTA)*, Xian, China, Dec. 6–8, 2023. **Received Best Paper Award**.
11. Dong-Uk Seo, **Hyungtae Lim**, Eungchang Mason Lee, Hyunjun Lim, and Hyun Myung, "Enhancing Robustness of Line Tracking Through Semi-Dense Epipolar Search in Line-based SLAM," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Detroit, U.S., Oct. 1–5, 2023, pp. 3483–3490.
12. **Hyungtae Lim**, Lucas Nunes, Benedikt Mersch, Xieyuanli Chen, Jens Behley, Hyun Myung, and Cyrill Stachniss, "ERASOR2: Instance-Aware Robust 3D Mapping of the Static World in Dynamic Scenes," in *Robotics: Science and Systems (RSS)*, Daegu, South Korea, Jul. 15–19, 2023.
13. **Hyungtae Lim**, Daebeom Kim, Beomsoo Kim, and Hyun Myung, "AdaLIO: Robust Adaptive LiDAR-Inertial Odometry in Degenerate Indoor Environments," in *Proc. Int. Conf. Ubiquit. Robot. (UR)*, Hawaii, U.S., Jun. 25–28, 2023, pp. 48–53.
14. **Hyungtae Lim**, Kawon Han, Gunhee Shin, Giseop Kim, Songcheol Hong, and Hyun Myung, "ORORA: Outlier-Robust Radar Odometry," in *Proc. IEEE Int. Conf. Robot. Automat. (ICRA)*, London, UK, May 29–Jun. 2, 2023, pp. 2046–2053.
15. Alex Junho Lee, **Hyungtae Lim**, Minho Oh, Wonho Song, and Hyun Myung, "Volumetric Vegetation Monitoring From LiDAR Scans With Ground Estimation," in *Proc. Int. Conf. Control, Automat. Syst. (ICCAS)*, Busan, Republic of Korea, Nov. 27–Dec. 1, 2022, pp. 1378–1379.
16. Seungjae Lee, **Hyungtae Lim**, and Hyun Myung, "Patchwork++: Fast and Robust Ground Segmentation Solving Partial Under-Segmentation Using 3D point cloud," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Kyoto, Japan, Oct. 22–27, 2022, pp. 13276–13283.
17. Sumin Hu, Yeeun Kim, **Hyungtae Lim**, Alex Junho Lee, and Hyun Myung, "eCDT: Event Clustering for Simultaneous Feature Detection and Tracking," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Kyoto, Japan, Oct. 22–27, 2022, pp. 3808–3815.
18. Dong-Uk Seo, **Hyungtae Lim**, Seungjae Lee, and Hyun Myung, "PaGO-LOAM: Robust ground- optimized LiDAR odometry," in *Proc. Int. Conf. Ubiquit. Robot. (UR)*, Jeju, Republic of Korea, Jul. 4–6, 2022, pp. 1–7.

19. **Hyungtae Lim**, Suyong Yeon, Soohyun Ryu, Yonghan Lee, Youngji Kim, Jaeseong Yun, Euigon Jung, Donghwan Lee, and Hyun Myung, "A Single Correspondence Is Enough: Robust Global Registration to Avoid Degeneracy in Urban Environments," in *Proc. IEEE Int. Conf. Robot. Automat. (ICRA)*, Philadelphia, USA, May 23–27, 2022, pp. 8010–8017.
20. Sungwon Hwang, **Hyungtae Lim**, and Hyun Myung, "Equivariance-Bridged SO(2)-Invariant Representation Learning Using Graph Convolutional Network," in *Proc. British Machine Vis. Conf. (BMVC)*, Virtual, Oct. 22–25, 2021.
21. Hyungyu Lee, Myeongwoo Jeong, Chanyoung Kim, **Hyungtae Lim**, Changgue Park, Sungwon Hwang, and Hyun Myung, "Low-level Pose Control of Tilting Multirotor for Wall Perching Tasks Using Reinforcement Learning," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Prague, Czech Republic (Virtual), Sep. 27–Oct. 1, 2021, pp. 9669–9676.
22. Eungchang Mason Lee, Junho Choi, **Hyungtae Lim**, and Hyun Myung, "REAL: Rapid Exploration With Active Loop-Closing Toward Large-Scale 3D Mapping Using UAVs," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Prague, Czech Republic (Virtual), Sep. 27–Oct. 1, 2021, pp. 4194–4198.
23. **Hyungtae Lim**, Hyeonjae Gil, and Hyun Myung, "MSDPN: Monocular Depth Prediction With Partial Laser Observation Using Multi-stage Neural Networks," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Las Vegas, USA (Virtual), Oct. 24–Dec. 24, 2020, pp. 10750–10757.
24. **Hyungtae Lim**, Sungwon Hwang, Sungjae Shin, and Hyun Myung, "Normal Distributions Transform is Enough: Real-Time 3D Scan Matching for Pose Correction of Mobile Robot Under Large Odometry Uncertainties," in *Proc. Int. Conf. Control, Automat. Syst. (ICCAS)*, Busan, Republic of Korea, Oct. 13–16, 2020, pp. 1155–1161, **Received Student Best Paper Award**.
25. **Hyungtae Lim**, Changgue Park, and Hyun Myung, "RONet: Real-Time Range-Only Indoor Localization via Stacked Bidirectional LSTM with Residual Attention," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Macau, China, Nov. 4–8, 2019, pp. 3241–3247.
26. Jungmo Koo, Changgue Park, **Hyungtae Lim**, and Hyung Myung, "Light-Weight Deep Neural Networks for Multi-Target Classification," in *Proc. Int. Conf. Control, Automat. Syst. (ICCAS)*, Jeju, Republic of Korea, Oct. 15–18, 2019.
27. Jieum Hyun, Taekjun Oh, **Hyungtae Lim**, and Hyung Myung, "UWB-Based Indoor Localization Using Ray-Tracing Algorithm," in *Proc. Int. Conf. Ubiquit. Robot. (UR)*, Hawaii, USA, Jun. 24-27, 2019, pp. 98–101.
28. **Hyungtae Lim**, Jungmo Koo, Jieum Hyun, and Hyung Myung, "Effective Indoor Robot Localization by Stacked Bidirectional LSTM Using Beacon-Based Range Measurements," in *Proc. Int. Conf. Robot Intell. Tech. Applications (RiTA)*, Putrajaya, Malaysia, Dec. 16-18, 2018, pp. 144–151.
29. **Hyungtae Lim**, Jungmo Koo, Jieum Hyun, and Hyun Myung, "Recurrent Neural Networks for Range-Based Indoor Robot Localization," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, Madrid, Spain, Oct. 1–5, 2018.

Teaching Experience

[CTP445] Augmented Reality (Lecturer: Prof. Woontack Woo) — *Minor Program in Culture Technology, KAIST*

Guest Lecturer for six weeks to teach basic knowledge of visual SLAM — *Spring, 2023*

[EE581] Linear Systems (Lecturer: Prof. Donghwan Lee) — *Electrical Engineering, KAIST*

Teaching assistant — *Spring, 2022*

[EE585] Mobile Robotics and Autonomous Navigation (Lecturer: Prof. Hyun Myung) — *Electrical Engineering, KAIST*

Teaching assistant — *Fall, 2021*

[EE581] Linear Systems (Lecturer: Prof. Donghwan Lee) — *Electrical Engineering, KAIST*

Teaching assistant — *Spring, 2021*

[EE688] Optimal Control Theory (Lecturer: Prof. Donghwan Lee) *Electrical Engineering, KAIST*

Teaching assistant *Fall, 2020*

[EE305] Introduction to Electronics Design Lab (Lecturer: Prof. Dongho Cho) *Electrical Engineering, KAIST*

Teaching assistant *Spring, 2020*

[CE208] IT in Construction Engineering (Lecturer: Prof. Hyun Myung) *Civil Engineering, KAIST*

Teaching assistant *Fall, 2018*

[CE558] Introduction to Civil Robotics (Lecturer: Prof. Hyun Myung) *Civil Engineering, KAIST*

Teaching assistant *Spring, 2018*

Honors & Awards

International Awards

2025 **IEEE ICRA'25 Outstanding Reviewer Award**, IEEE ICRA'25 *Atlanta, USA*

2024 **RSS Pioneer**, RSS Pioneers 2024 Workshop, in *RSS'24* *Delft, Netherlands*

2024 **1st Prize**, HILTI SLAM Challenge in *IEEE ICRA'24* *Yokohama, Japan*

2023 **Best Paper Award**, RiTA'23 *Xian, China*

2023 **Best Paper Award (among 1,100 papers, 5 papers are received)**, IEEE RA-L *London, UK*

2023 **1st Prize (among 63 teams)**, HILTI SLAM Challenge in *IEEE ICRA'23* *London, UK*

2023 **CES Innovation Award**, Consumer Technology Association (CES) *San Francisco, USA*

2022 **2nd Cash Prize, 4th in Total**, HILTI SLAM Challenge in *IEEE ICRA'22* *Philadelphia, USA*

2020 **Student Best Paper Award**, ICCAS *Busan, Republic of Korea*

Domestic Awards

2020 **Kim Sung-Bue Creative Activity Award**, KAIST *Daejeon*

2019 **Han Cheolhui Augustine Scholarship**, EE, KAIST *Daejeon*

2019 **1st Prize**, Hitachi-LG LiDAR Application Competition *Seoul*

2018 **Excellence Prize**, Smart City Service and Start-Up Competition *Seoul*

2015 **Dean's List**, ME, KAIST *Daejeon*

Academic Services

2025 **Program committee**, RSS Pioneer'2025 Workshop committee *USA*

2024– **Associated Editor**, IEEE Robot. Automat. Lett. (RA-L)

2024 **Reviewer**, RA-L, T-RO, IJRR, IROS, ICRA, CVPR

2023 **Reviewer**, RA-L, T-RO, IJRR, IROS, ICRA