

RESEARCH INTEREST

- **Mapping** : Semantic SLAM, Point Cloud Registration, Map Representation
- **Navigation** : Risk-aware, Uncertainty-aware, Active SLAM

EDUCATION

The University of Tokyo

Apr. 2023 – Mar. 2025

M.E.S. Student in Human & Engineered Environmental Studies

- Thesis: Switching-based Multi-modal SLAM for Extreme and Degraded Environments

Osaka University

Apr. 2017 – Mar. 2023

B.E. in Mechanical Engineering

(Military Service included)

- Thesis: LiDAR-visual SLAM for Online Mapping of Unpaved Road Surface

PUBLICATIONS

- [1] **Accurate and Rapid Reduction of Spherical Image Distortion for Feature-Based Pose Estimation**
Taisei Ando, [Junwoon Lee](#), Mitsuru Shinozaki, Toshihiro Kitajima, Qi An, Atsushi Yamashita
International Journal of Automation Technology (under review)
- [2] **Self-TIO: Thermal-Inertial Odometry via Self-supervised 16-bit Feature Extractor and Tracker**
[Junwoon Lee](#), Taisei Ando, Mitsuru Shinozaki, Toshihiro Kitajima, Qi An, Atsushi Yamashita
IEEE Robotics and Automation Letters (RA-L), 2025. (Accepted)
- [3] **TC-LTIO: Tightly-coupled LiDAR Thermal Inertial Odometry for LiDAR and Visual Odometry Degraded Environments - Best Paper Award (0.25%)**
[Junwoon Lee](#), Taisei Ando, Mitsuru Shinozaki, Toshihiro Kitajima, Qi An, Atsushi Yamashita
International Conference on Control, Automation and Systems (ICCAS), 2024. [\[Link\]](#)
- [4] **Highly Accurate and Fast Two-view Pose Estimation by Fast Reduction of Spherical Image Distortion Effects**
Taisei Ando, [Junwoon Lee](#), Mitsuru Shinozaki, Toshihiro Kitajima, Qi An, Atsushi Yamashita
International Conference on Control, Automation and Systems (ICCAS), 2024. [\[Link\]](#)
- [5] **Switch-SLAM: Switching-Based LiDAR-Inertial-Visual SLAM for Degenerate Environments**
[Junwoon Lee](#), Ren Komatsu, Mitsuru Shinozaki, Toshihiro Kitajima, Hajime Asama, Qi An, Atsushi Yamashita
IEEE Robotics and Automation Letters (RA-L), 2024. Presented at ICRA40. [\[Link\]](#)
- [6] **Three-dimensionalized Feature-Based LiDAR-visual Odometry for Online Mapping of Unpaved Road Surface**
[Junwoon Lee](#), Masamitsu Kurisu, Kazuya Kuriyama
Journal of Field Robotics, 2024. [\[Link\]](#)

HONORS AND AWARDS

Best Paper Award

Oct. 2024

- Top 1 of 400 submitted papers, ICCAS '24 (0.25%)

IEEE RAS Travel Grant

Sep. 2024

- Travel support for ICRA@40, \$2,000 USD

Rotary Yoneyama Memorial Foundation Scholarship

Apr. 2023 – Mar. 2025

- Full scholarship for academic excellence, \$30,000+ USD

Korea-Japan Joint Government Scholarship

Apr. 2017 – Mar. 2023

- Government-sponsored full scholarship, \$75,000+ USD

RESEARCH EXPERIENCE

Research Assistant, The University of Tokyo
Real World Robot Informatics Lab.

Apr. 2023 – Mar. 2025

- Developed a multi-modal SLAM system for complex scenes [3, 5].
- Developed a self-supervised point tracker for thermal inertial odometry [2, 3].

Research Assistant, Osaka University
Komatsu MIRAI Construction Equipment Cooperative Research Center

Apr. 2022 – Mar. 2023

- Suggested an intensity-weighted point cloud registration [6].
- Developed a mapping system for an unpaved road surface.

PATENT

1. Kaoru Adachi, Masamitsu Kurisu, Junwoon Lee, “Terrain Detection System and Method,” *Japanese Patent 2023-105215*, Filed on June 27, 2023.

SERVICES

Academic Reviewer

2024

- IEEE RA-L, IEEE T-ASE, ICRA, ICCAS

Special Lecturer, Rotary International

Apr. 2023 – Mar. 2025

- Lectured on the introduction to mobile robotics and artificial intelligence

Sergeant, Republic of Korea Army

Apr. 2020 – Oct. 2021

- Served as a frontline guardian at a coastline observation post in the 23rd Security Brigade

SKILLS

Research Skills

- Program Languages : C/C++, Python
- Professional : ROS1, ROS2, GTSAM, Ceres Solver, OpenCV, PyTorch, TensorRT
- Etc. : Git, Docker, Open3D, OpenMP, SolidWorks, Blender, LaTeX

Languages

- English (Professional)
- Japanese (Professional)
- Korean (Native)

REFERENCES

Dr. Atsushi Yamashita

Professor, The University of Tokyo
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Dr. Qi An

Associate Professor, The University of Tokyo
anqi@robot.t.u-toyko.ac.jp

Dr. Ren Komatsu

Engineer, Mujin, Inc. (Former Professor in UTokyo)
komatsu@robot.t.u-tokyo.ac.jp

Dr. Kazuya Kuriyama

Project Professor, Osaka University
kazuya_kuriyama@global.komatsu