Taeyoung **Kim**

Robotics · SLAM Engineer

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"Nothing ventured, nothing gained."

Summary

This is Taeyoung Kim, who wants to become robotics SLAM / Navigation engineer. My research interests are Sensor fusion and SLAM. I like to take on challenging tasks and I like to grow up with my colleagues around me. That's why I record and share what I did on my Github or Technical Blog. I'm also interested in contributing open-source projects.

Research Interests

SLAM / Spatial AI Focusing on LiDAR(-inertial) SLAM, Robust Localization, Neural representation

Sensor fusion Spatial-temporal calibration for LiDAR, IMU, and Camera etc.

Education

Yonsei University @CILAB — *Seoul, S.Korea*

M.S. in Vehicle Convergence Engineering (Advisor: Prof. Euntai Kim) — *Mar. 2022 - Feb. 2024*

- **Total GPA** : 4.05 / 4.3
- **Teaching Assistant** : 2023-1 Research Experience for Undergraduate (REU)
- Focusing on LiDAR (-inertial) SLAM
- Research on LiDAR-IMU extrinsic calibration method

Kwang Woon University — *Seoul, S.Korea*

B.S. in School of Robotics — *Mar. 2016 - Feb. 2022*

- **Total GPA** : 4.10 / 4.50, **Major GPA** : 4.41 / 4.50
- **Club**: BARAM (Robotics Academic Group) - [2020 Staff] , DAISY (English Conversation Club) - [2019 Spring President]

Work Experience

Hyundai Motor Group @Robotics Lab — *Uiwang-si, Gyeonggi-do, S.Korea*

Research Engineer — *Feb. 2024 - Current*

- Research on mobile robot navigation system

KIST(Korea Institute of Science and Technology) @Robot Vision Lab — *Seoul, S.Korea*

Student Intern (Advisor : Dr. Kanggeon Kim) — *Sep. 2020 - Feb. 2021*

- Research on Monocular Depth Estimation
- Participated in KIST disinfect robot (AI Disinfection Robot) project - **[Video]**

Projects

Cooperative mapping, environment recognition, and autonomous driving technology for multiple mobile robots operating in large indoor workspaces — *KEIT*

Participant — *Apr. 2023 - Dec. 2023*

- Development multi robot navigation systems - **[Certification]**

Development of Core Technology for Mobile Manipulator for 5G Edge-based Transportation and Manipulation — *Ministry of Science and ICT*

Participant — *May. 2022 - Dec. 2022*

- Development LiDAR-inertial visual SLAM algorithm for mobile manipulator - **[Certification]**

Developing LiDAR-IMU calibration methods for mobile robots — *Hyundai NGV*

Participant — *May. 2022 - Feb.2024*

- Development LiDAR-IMU extrinsic calibration method focusing on mobile robots - **[Certification]**
- Presented at the Hyundai Motor Group Future Mobility Research Exchange in KSAE 2023 workshop

Publication

International Journal

2023.12 **"GRIL-Calib: Targetless Ground Robot IMU-LiDAR Extrinsic Calibration Method using Ground Plane Motion Constraints"**, Taeyoung Kim, Gyuhyeon Pak and Euntai Kim. **https://doi.org/10.48550/arXiv.2312.14035** *Arxiv*

2021.11 **"Standard for the Quantification of a Sterilization Effect Using an Artificial Intelligence Disinfection Robot"**, Heeju Hong, Wonkook Shin, Jieun Oh, Sunwoo Lee, Taeyoung Kim , Woosub Lee, Jongsuk Choi, Seungbeum Suh and Kanggeon Kim, Sensors 21, no. 23: 7776. **https://doi.org/10.3390/s21237776** *Sensors*

International Conference

2022.7 **"Robust Feature Tracking for Better Visual-Inertial System using Dynamic Mask"**, Gyuhyeon Pak, Taeyoung Kim, Euntai Kim - **[Paper]** *ICCAS 2022*

2021.7 **"Dense Monocular SLAM applied Depth Estimation"**, Taeyoung Kim, Omer Faruk Ince, JongBeom Baek, Jun-Sik Kim, KangGeon Kim - **[Paper]**, **[Video]** *UR 2021 (Work in progress)*

Domestic Conference

2023.6 **"Comparative analysis of LiDAR-inertial odometry/SLAM algorithm performance for ground robots"**, Taeyoung Kim, Yechan Park, Euntai Kim - **[Paper]** *ICROS 2023*

2021.5 **"Recognition of disinfection targets and generation of semantic map for disinfection robot"**, TaeHwan Kim, Taeyoung Kim, GiJae Lee, KangGeon Kim - **[Paper]** *KROS 2021*

Honors & Awards

Awards

2023.12 **Outstanding Research Awards**, for Academic Excellence *Yonsei Univ.*

2023.10 **4th Place on LiDAR-inertial track**, ICCV 2023 SLAM Challenge - **[Certification]**, **[Video]** *AirLab, Carnegie Mellon Univ.*

2020.11 **Dean's List**, for Academic Excellence *KwangWoon Univ.*

2020.9 **5th Place on B-track**, Korea Health Datathon 2020 *NAVER CLOUD PLATFORM*

2019.10 **Dean's List**, for Academic Excellence *KwangWoon Univ.*

Honors

2023 **Full tuition Scholarship**, *Hyundai NGV*

2022 for the students who have been based on Recruitment Conditions on Hyundai Motors Group

2021 **National Science and Engineering Undergraudate Scholarship** , *Korea Student Aid Foundation*

2020 for the students who have been recommended by the university **(Full tuition Scholarship)**

2019-2 **Full tuition Scholarship**, for Top seat last semester *KwangWoon Univ.*

Skills

Programming C++ / C, Python, Matlab

DevOps Git, Docker, ROS2 / ROS

Languages Korean, English

Extracurricular Activity

Technical Blogs

Github blog

Writers *May. 2020 - Present*

- You can easily access the blog using **[this link]**.
- Writing some posts about lecture summary, paper review, some tips for developments.
- To share what I have studied with others and to remember it longer.

Open Source Contribution Academy (2021 - 2022)

Ministry of Science and ICT

2022 Mentor, 2021 Mentee

Aug. 2021 - Nov. 2022

- I am in the process of translating a Pytorch tutorial into Korean that I want to contribute to the spread of PyTorch.
- Using Github, I developed the ability to collaborate and contribute to open source.
- The open source repository I've contributed can be found **[tutorials-kr]**.

CLOVA AI RUSH 2021

NAVER AI Lab, NAVER CLOVA

Participant

May. 2021 - Jun.2021

- Only 150 students are allowed to participate in this project.
- I developed my own deep learning model related to multi-label classification.
- I ranked 30th on Project 1-3.

2021 Spring Capstone Design

KwangWoon Univ.

Project

Mar. 2021 - Jun.2021

- I made a wireless charging electric vehicle charging robot.
- I designed the control input algorithm, trained deep learning model, and developed the ROS package.
- The source code related to this project is on my **[Github repository]**.

Monocular Depth Estimation with ORB-SLAM2

BARAM (Robotics Academic Group)

Personal Toy Project

Sep. 2020 - Nov. 2020

- I was curious about the performance of the recent depth estimation model.
- I used **'Monocular Depth Estimation with Transfer Learning pretrained MobileNetV2'** model and applied to ORB-SLAM2 also compared with ORB-SLAM2(Monocular mode), ORB-SLAM2(RGB-D mode)
- The source code related to this toy project is on my **[Github repository]**.