Hyeonjae Gil

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EDUCATION

Seoul National University, Republic of Korea   03/2022-Present
- *M.S. student* in Mechanical Engineering
- Cumulative GPA 4.03/4.3

TU Delft, Netherlands   02/2020-04/2020
- *Exchange student* in Mechanical Engineering

KAIST, Republic of Korea   03/2016-08/2021
- *Bachelor* in Mechanical Engineering (minor: Electronic Engineering)
- Cumulative GPA 3.54/4.3

Relevant Courses: Sensor-Based Spatial Intelligence, Advance Navigation Systems, Machine Learning for Mechanical Engineering

TECHNICAL SKILLS

- C++, Python, ROS, Pytorch, MATLAB, GitHub, Jira, Docker, Ubuntu, OpenWrt.

RESEARCH INTERESTS

- Sensor Fusion for State Estimation
- Long-term Visual Place Recognition
- Visual SLAM for end-user application

WORK / RESEARCH EXPERIENCE

Master's Student @ SNU RPM Lab   03/2022-Present
- Design real-time state estimator by tightly-fusing IMU, 3D LiDAR, and raw GNSS measurements to overcome drawbacks of loosely-coupled GNSS fix measurements.
- Explore novel image normalization technique for enhancing feature detection, description, and aggregation in Thermal Image-based SLAM.
- Lead *National R&D Project for Smart Construct Technology* to develop LiDAR-based SLAM and path tracking module in UGV.

Robotics Software Engineer & Co-Founder @ FLOATIC   06/2021-06/2022
- Constructed a sensor system for AMR to be operated in warehouse.
- Developed real-time LiDAR SLAM and marker-based localization algorithms for AMR.
- Designed dynamic objects handler pipeline with object detection DNN.
- Developed network system to divide public and private interface with OpenWrt software.
- Initiated and managed tools for source codes (GitHub), project schedules (Jira), and wiki (Notion).

Internship, Robotics Vision Team @ NAVERLABS   09/2020-03/2021
- Carried out a project for the Proof of Concept (POC) of cleaning robots.
- Built multi-robot system composed of both spatial-moving and vertical-moving agents.
- Designed Graph SLAM architecture for mobile robot localization and navigation.
- Integrated Machine Learning algorithm for 2D LiDAR object classification.

Research Assistant @ KAIST Urban Robot Lab   07/2019-09/2019
- Designed hardware and software of sensor system with multiple modalities (2D LiDAR, RGB-D Camera).
- Acquired *KAIST RGBD-Scan Dataset* for validating the Depth Estimation Deep Neural Network.

PUBLICATIONS

- Dong-Guw Lee, **<u>Hyeonjae Gil</u>**, Seungsang Yun, Jeongyun Kim, and Ayoung Kim, "Night-to-day thermal image translation for deep thermal place recognition.", *Intelligent Service Robotics* (2023), DOI: 10.1007/s11370-023-00473-7.
- **<u>Hyeonjae Gil</u>**, Dongjae Lee, Gwanhyeong Song, Seunguk Ahn, and Ayoung Kim, "Tightly-Coupled GNSS-LIDAR-Inertial State Estimator for Mapping and Autonomous Driving.", *Journal of Korea Robotics Society* (2023), DOI: 10.7746/jkros.2023.18.1.072.
- Hyungtae Lim, **<u>Hyeonjae Gil</u>**, and Hyun Myung, "MSDPN: Monocular Depth Prediction with Partial Laser Observation using Multi-stage Neural Networks." *in Proc. of IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems (IROS)*, Las Vegas, USA (virtual), 2020, DOI: 10.1109/IROS45743.2020.9340767

PATENTS

- C. Lee, J. Park, H. Ryu, **H. Gil**, H. Jeon, "Robot System and Control Method Thereof", Korean Patent No. 10-2507705 (2023).