Hojune Kim

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RESEARCH INTERESTS

Robot Perception: multi-sensor SLAM, Graph Optimization, Spatial Segmentation
System Engineering: System Design and Manufacture

EDUCATION

Seoul National University   Mar. 2019 – Aug. 2025(Expected)
B.S. in Aerospace Engineering   *Seoul, South Korea*
- GPA: 4.21/4.30(Major), 4.07/4.30(Overall)

ETH Zürich   Feb. 2024 – Aug. 2024
Exchange Student in Mechanical Engineering   *Zürich, Switzerland*

WORKING EXPERIENCE

German Aerospace Center DLR   Sept. 2024 – Feb. 2025(Expected)
Guest Researcher, Advisor: Prof. Jinoh Lee   *Munich, Germany*
- Topic : Vision based Ground Perception for Humanoid Robot

RESEARCH EXPERIENCES

Vision for Robotics Lab   Feb. 2024 – Aug. 2024
Undergraduate Researcher, Advisor: Prof. Margarita Chli   *ETH Zürich*
- Topic : Continuous-Time SLAM via Gaussian Belief Propagation for distributed system

Robust Perception and Mobile Robotics Lab   Jan. 2023 – Mar. 2024
Undergraduate Researcher, Advisor: Prof. Ayoung Kim   *Seoul National University*
- Topic : Robust mmWave Radar Odometry / Direct SLAM with Infrared camera and LiDAR /
  Camera-LiDAR-Radar Calibration via Graph Optimization

Satellite Geophysics Lab   Aug. 2020 – May. 2021
Undergraduate Researcher, Advisor: Prof. Duk-jin Kim   *Seoul National University*
- Topic : Real-time flood monitoring system via segmentation using satellite SAR image

PUBLICATION

Peer-Reviewed Workshop Paper
- (Oral) <u>H. Kim</u>, H. Jang and A. Kim. 2D Ego-Motion with Yaw Estimation using Only mmWave Radars via Two-Way weighted ICP. ***ICRA2024 Workshop*** on Radar in Robotics, Yokohama, Japan, 2024.

HONORS & AWARDS

Awards:

Gold Prize, International Student Car Competition Autonomous Driving Sector   Oct. 2021
Ministry of Land, Infrastructure and Transport, Republic of Korea

Minister of National Defense Award, Minister of Defense Startup Competition   Dec. 2022
Ministry of National Defense, Republic of Korea

Final Selected, Star-Exploration Startup Support Project   Feb. 2021
Korea Aerospace Research Institute(KARI)

Honors:

Korea-Germany Junior Research Fellowship Support, $9,000 Max Planck POSTECH   Sept. 2024
- Full coverage of expenses during in DLR as a guest researcher

Kwanjeong Undergraduate Scholarship, Kwanjeong Educational Foundation   Mar. 2021
- Full coverage of junior and senior tuition and $2,200 per semester

Global Leadership Program Scholarship, $3,300 Seoul National University	Spring 2024
Certificate of Appreciation(AI Tech Play), Dean, College of Engineering in SNU	Jun. 2021
Undergraduate Research Internship Scholarship, Seoul National University	Mar. 2020
Merit-based Scholarship, Seoul National University	Fall 2019, Spring & Fall 2020

GRADUATE COURSE PROJECTS

Perception and Learning for Robotics(5.5/6.0) — Spring 2024
Topic: Crowd Navigation with LiDAR via Reinforcement Learning — *ETH Zürich*
- Trained End-to-end model by teacher-student policies in Orbit(built on Isaac Sim)

Decision Making for Autonomous Aerospace Systems(A+) — Spring 2023
Topic: Fault Tolerant Control of Quadrotor — *Seoul National University*
- Designed Controller via Feedback Linearization, Sliding Mode and Backstepping

Sensor-Based Spatial Intelligence(A0) — Fall 2023
Topic: Analysis of LiDAR SLAM in long-term localization — *Seoul National University*
- Compared LiDAR SLAM in urban datasets for long term localization

MEMBERSHIPS & ACTIVITIES

AI Tech Play(KAIT Foundation), Non-Profit Organization for AI education — Feb. 2021 – Aug. 2021
Tech/Assembly Team Leader
- served as Organizer : AI RC-car competition for children nationwide(200+ students participated)
- served as Developer : Modeled and manufactured AI RC-car system from skeleton for education and competition

SNU Tomorrow's Engineers Membership(STEM), SNU — Sept. 2023 – Present
- Launch academic talks : LiDAR vs Radar in perception field / Start-up business model building

CH-47 Helicopter Flight Attendant, Republic of Korea Army — Aug. 2021 – Feb. 2023
- Put on the forest fire extinguish mission during the military service

SNU ZERO, Autonomous Driving Car Club in SNU — 2021
- Perform Extended-Kalman Filter with IMU, GPS and land detection for robust localization
- Dynamic obstacle detection by clustering LiDAR and combining vision detection

Bulnabi, Autonomous Flight Drone Club in SNU — 2023
- Develop auto-landing path planned via bézier curve. Simulated in Gazebo and verified in on-board flight
- Signing technology transfer sales to the company

Science Volunteer Corps, SNU — Jul. 2019
- Held Science experiment and mentoring for students in Gochang

TEACHING EXPERIENCE

Teaching Assistant — Spring 2023
- (M3228.001300)Basic of Robot Programming and Mechanical System Design — *Seoul National University*

Teaching Tutor — Fall 2023
- Engineering Mathematics I — *Seoul National University*
- Dynamics

PATENT

Parking Location Tracking System, KR102291377B1 — 2021
- <u>H. Kim</u>, T. Kim, J. Na, J. Lee, S. Jeong

SKILLS

Programming: C/C++, Python, Javascript	**Manufactures**: SolidWorks, 3D printer(Stratasys), Laser cutter
Frameworks: ROS, Isaac Sim, Gazebo, Pytorch	**Tools**: PX4-Autopilot, Matlab, LS-DYNA, Docker, QGIS