Hojune Kim

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RESEARCH INTERESTS

Robot Perception: multi-sensor SLAM, Graph Optimization, Multi-agent Systems
System Engineering: System Design, Modelling 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 mentoring : organize mentoring seminar for engineering freshmen
- Launch academic talks : LiDAR vs Radar in perception field / Start-up business model building

CH-47D Flight Attendant, Republic of Korea Army   Aug. 2021 – Feb. 2023
- Put on tactical missions including 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*
- teach machine learning in python and develop final competition kit for 100+ freshmen in mechanical engineering

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

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, Docker, Figma, QGIS