

HOJUNE KIM

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RESEARCH INTERESTS

Safe Autonomy: State Estimation, Safety-Critical Control, Multi-agent Systems

Optimization: Graph Optimization, Distributed Optimization, Recursive Estimation

Applications: System Design, Experimental Validation (Worked on Car / Quadcopter / Quadruped Robot / Humanoid)

EDUCATION

Seoul National University (SNU)

Mar. 2019 – Present

B.S. in Aerospace Engineering, summa cum laude (expected)

Seoul, South Korea

- GPA: **4.0/4.0(Major)**, 3.9/4.0(Overall) - Kwanjeong Scholar

* 1.5-year absence from military service

ETH Zürich

Feb. 2024 – Aug. 2024

Visiting Student in Mechanical Engineering

Zurich, Switzerland

PUBLICATION

- 2D Ego-Motion with Yaw Estimation using Only mmWave Radars via Two-Way weighted ICP

Hojune Kim, Hyesu Jang, Ayoung Kim.

IEEE ICRA 2024 Workshop on Radar in Robotics, Yokohama, Japan, 2024. (Oral)

WORK EXPERIENCE

German Aerospace Center DLR

Sept. 2024 – Present

Humanoid TORO team, Guest Researcher, Advisor: Prof. Jinoh Lee

Munich, Germany

- Developing Active Learning for Semantic Mapping in Humanoid Navigation via Kinematic-Aided Visual Odometry

RESEARCH EXPERIENCE

Vision for Robotics Lab | ETH Zürich

Feb. 2024 – Aug. 2024

Semester Project Intern, Advisor: Prof. Margarita Chli

Zurich, Switzerland

- Improved the open-source package of continuous-time SLAM via distributed optimization

Robust Perception and Mobile Robotics Lab | SNU

Jan. 2023 – Mar. 2024

Undergraduate Researcher, Advisor: Prof. Ayoung Kim

Seoul, South Korea

- Devised robust mmWave radar 2D odometry and implemented direct SLAM by fusing infrared camera and LiDAR
- Designed handheld sensor system development and held camera-LiDAR-radar calibration via graph optimization

Satellite Geophysics Lab | SNU

Aug. 2020 – May. 2021

Undergraduate Researcher, Advisor: Prof. Duk-jin Kim

Seoul, South Korea

- Developed real-time flood monitoring system via semantic segmentation using satellite SAR image

HONORS & AWARDS

Awards:

1st Place, IEEE-RAS Humanoids 2024 Competition Adult-sized Biped Free Walk

Nov. 2024

Minister of National Defense Award, Minister of Defense Startup Competition, \$5,000 funding

Dec. 2022

Ministry of National Defense, Republic of Korea

Gold Prize, International Student Car Competition Autonomous Driving Sector

Oct. 2021

Ministry of Land, Infrastructure and Transport, Republic of Korea

Final Selected, Star-Exploration Startup Support Project, \$9,000 funding

Feb. 2021

Korea Aerospace Research Institute(KARI)

Honors:

Korea-Germany Junior Research Fellowship Support, \$9,000 | Max Planck POSTECH/KOREA

Sept. 2024

- Full coverage of expenses during in DLR as a guest researcher

Global Leadership Program Scholarship | SNU

Feb. 2024

Certificate of Appreciation (AI Tech Play) Dean, College of Engineering in SNU	Jun. 2021
Kwanjeong Undergraduate Scholarship , \$17,000 Kwanjeong Educational Foundation	Mar. 2021
• Full coverage of junior and senior tuition and stipend	
Undergraduate Research Internship Scholarship SNU	Mar. 2021
Merit-based Scholarship SNU	Fall 2019, Spring & Fall 2020

SELECTED GRADUATE COURSE PROJECTS

Crowd Navigation for Quadrupe robot , Perception and Learning for Robotics ETH Zürich	Spring 2024
• Developed teacher-student reinforcement learning policies with LiDAR data using Proximal Policy Optimization	
Fault Tolerant Control of Quadrotor , Decision Making for Autonomous Aerospace Systems SNU	Spring 2023
• Designed Feedback Linearization, Sliding Mode and Backstepping Controllers on faulty condition	
Analysis of LiDAR-Inertial SLAM , Sensor-Based Spatial Intelligence SNU	Fall 2023
• Analyzed and evaluated the LiDAR-inertial SLAM(Fast-LIO2, Faster-LIO) in urban long-term dataset	

MEMBERSHIPS & ACTIVITIES

SNU Tomorrow's Engineers Membership(STEM) SNU	Sept. 2023 – Present
• Served as Mentor : Organized a mentoring seminar for over 150 undergraduate engineering students	
• Served as Speaker : Held academic talks for 'LiDAR vs Radar in perception' and 'Start-up business model building'	
Bulnabi , Autonomous Flight Drone Club SNU	Feb. 2023 – Jan. 2024
• Developed auto-landing algorithm with path planning via bézier curve for continuous trajectory and control	
• Verified in Gazebo simulation and on-board flight tests; finalizing technology transfer to the company	
Army Aviation Operations Command Republic of Korea Army	Aug. 2021 – Feb. 2023
<i>CH-47D Helicopter Flight Attendant & Maintenance Mechanics</i>	
• Produced CH-47D maintenance and put on tactical missions including forest fire extinguish for 60+ hours flight	
SNU ZERO , Autonomous Driving Car Club SNU	Jan. 2021 – Oct. 2021
• Performed Extended-Kalman Filter with IMU, GPS and line detection for robust localization	
• Developed dynamic obstacle avoidance by clustering LiDAR and combining vision detection	
AI Tech Play(KAIT Foundation) , Non-Profit Organization for AI education	Feb. 2021 – Aug. 2021
<i>Co-organizer & Hardware Team Leader</i>	
• Served as Organizer : Hosted nationwide AI camp and autonomous race car competition for over 200 students	
• Served as Hardware Leader : Developed novel autonomous race car system for education and competition	
Science Volunteer Corps SNU	Jul. 2019
• Held science experiment and mentoring camp for middle and high school students in Gochang	

TEACHING EXPERIENCES

Teaching Assistant	
(M3228.001300) Basic of Robot Programming and Mechanical System Design SNU	Spring 2023
• Taught machine learning algorithms in Python and developed propeller competition kits for over 100 students	
Teaching Tutor	
(033.014) Engineering Mathematics 1 SNU	Fall 2023
(M2795.002100) Dynamics SNU	Fall 2023

PATENT

1. Parking Location Tracking System, *KR102291377B1*, 2021
Hojune Kim, Taekin Kim, Jinhwan Na, Jaeyoung Lee, Seunghwan Jeong

SKILLS

Programming: C/C++, Python, Matlab, Javascript	Sensors: Radar, LiDAR, RGB-d/Thermal camera
Frameworks: ROS, Isaac Sim, Gazebo, Ceres, Pytorch	Manufactures: SolidWorks, 3D printer, Laser cutter