

HOJUNE KIM

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RESEARCH INTERESTS

Safe Autonomy: State Estimation, Safety-Critical Control, Spatial AI

Optimization: Graph Optimization, Recursive Estimation, Distributed Optimization

Application: System Designing, Planning, Navigation (Worked on Car / Quadcopter / Quadruped Robot / Humanoid)

EDUCATION

Seoul National University (SNU)

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

- GPA: **4.00/4.00(Major)**, 3.91/4.00(Overall)

Mar. 2019 – Present

Seoul, South Korea

* 1.5-year absence from military service

ETH Zürich

Exchange Student in Mechanical Engineering

Feb. 2024 – Aug. 2024

Zurich, Switzerland

PUBLICATION

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

Hojune Kim, Hyesu Jang, Ayoung Kim.

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

WORKING EXPERIENCE

German Aerospace Center DLR

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

- Topic : Humanoid Navigation on Unknown Semantic Mapping with Kinematic aided Visual Odometry

Sept. 2024 – Present

Munich, Germany

RESEARCH EXPERIENCES

Vision for Robotics Lab | ETH Zürich

Semester Project Intern, Advisor: Prof. Margarita Chli

- Topic : Continuous-Time SLAM via Gaussian Belief Propagation for distributed system

Feb. 2024 – Aug. 2024

Zurich, Switzerland

Robust Perception and Mobile Robotics Lab | SNU

Undergraduate Researcher, Advisor: Prof. Ayoung Kim

- Topic : Robust mmWave Radar Odometry / Direct SLAM with Infrared camera and LiDAR
- Topic : Handheld Sensor System Development / Camera-LiDAR-Radar Calibration via Graph Optimization

Jan. 2023 – Mar. 2024

Seoul, South Korea

Satellite Geophysics Lab | SNU

Undergraduate Researcher, Advisor: Prof. Duk-jin Kim

- Topic : Real-time flood monitoring system via semantic segmentation using satellite SAR image

Aug. 2020 – May. 2021

Seoul, South Korea

HONORS & AWARDS

Awards:

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

Sept. 2024

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

Kwanjeong Undergraduate Scholarship, \$17,000 | Kwanjeong Educational Foundation

Mar. 2021

- Full coverage of junior and senior tuition and stipend

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

SELECTED GRADUATE COURSE PROJECTS

Perception and Learning for Robotics ETH Zürich	Spring 2024
Topic: Crowd Navigation with LiDAR via Reinforcement Learning	
• Trained End-to-end model by teacher-student policies in Orbit(built on Isaac Sim)	
Decision Making for Autonomous Aerospace Systems SNU	Spring 2023
Topic: Fault Tolerant Control of Quadrotor	
• Designed Controller via Feedback Linearization, Sliding Mode and Backstepping methods on faulty condition	
Sensor-Based Spatial Intelligence SNU	Fall 2023
Topic: Analysis of LiDAR-Inertial SLAM in long-term localization	
• Compared and evaluated the Fast-LIO2 and Faster-LIO in urban datasets	

MEMBERSHIPS & ACTIVITIES

SNU Tomorrow's Engineers Membership(STEM) SNU	Sept. 2023 – Present
• Launched academic mentoring : Organized a mentoring seminar for engineering freshmen	
• Launched academic talks : LiDAR vs Radar in perception field / 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 : Autonomous RC car competition for nationwide students(200+ students participated)	
• Served as Developer : Developed novel AI-driven RC car system from scratch 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 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