

# HOJUNE KIM

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## RESEARCH INTERESTS

**Safe Autonomy:** Robotic Perception, Safe and Secure Planning, Multi-agent Systems

**Optimization Theory:** Graph Optimization, Recursive Estimation, Distributed Optimization

**System Engineering:** System Design, Modeling and Manufacture (Worked on Car / Drone / Quadruped / Humanoid)

## EDUCATION

**Seoul National University (SNU)**

Mar. 2019 – Present

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

Seoul, South Korea

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

\* 1.5-year absence from military service

**ETH Zürich**

Feb. 2024 – Aug. 2024

Exchange 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.

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

## WORKING EXPERIENCE

**German Aerospace Center DLR**

Sept. 2024 – Present

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

Munich, Germany

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

## RESEARCH EXPERIENCES

**Vision for Robotics Lab | ETH Zürich**

Feb. 2024 – Aug. 2024

Semester Project Intern, Advisor: Prof. Margarita Chli

Zurich, Switzerland

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

**Robust Perception and Mobile Robotics Lab | SNU**

Jan. 2023 – Mar. 2024

Undergraduate Researcher, Advisor: Prof. Ayoung Kim

Seoul, South Korea

- Topic : Robust mmWave Radar Odometry / Direct SLAM with Infrared camera and LiDAR
- Topic : Handheld Sensor System Development / 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

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

## 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

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

## SELECTED GRADUATE COURSE PROJECTS

<b>Perception and Learning for Robotics</b>   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)	
<b>Decision Making for Autonomous Aerospace Systems</b>   SNU	Spring 2023
Topic: Fault Tolerant Control of Quadrotor	
• Designed Controller via Feedback Linearization, Sliding Mode and Backstepping methods on faulty condition	
<b>Sensor-Based Spatial Intelligence</b>   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

<b>SNU Tomorrow's Engineers Membership(STEM)</b>   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	
<b>Bulnabi</b> , 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	
<b>Army Aviation Operations Command</b>   Republic of Korea Army	Aug. 2021 – Feb. 2023
<i>CH-47D Helicopter Flight Attendant &amp; Maintenance Mechanics</i>	
• Produced CH-47D maintenance and put on tactical missions including forest fire extinguish for 60+ hours flight	
<b>SNU ZERO</b> , 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	
<b>AI Tech Play(KAIT Foundation)</b> , Non-Profit Organization for AI education	Feb. 2021 – Aug. 2021
<i>Co-organizer &amp; 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	
<b>Science Volunteer Corps</b>   SNU	Jul. 2019
• Held science experiment and mentoring camp for middle and high school students in Gochang	

## TEACHING EXPERIENCES

<b>Teaching Assistant</b>	
(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	
<b>Teaching Tutor</b>	
(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

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