HOJUNE KIM

hojjunekim@snu.ac.kr | hojjunekim.github.io

RESEARCH INTERESTS

Safe Autonomy: State Estimation, Safety-Critical Control, Motion Planning
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: **4.00/4.00(Major)**, 3.91/4.00(Overall) * 1.5-year absence from military service

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

PUBLICATION

1. 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

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
CH-47D Helicopter Flight Attendant & Maintenance Mechanics
- 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
Co-organizer & Hardware Team Leader
- 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
Frameworks: ROS, Isaac Sim, Gazebo, Ceres, Pytorch
Sensors: Radar, LiDAR, RGB-d/Thermal camera
Manufactures: SolidWorks, 3D printer, Laser cutter