



# Jeonghan Kim

ROBOTICS RESEARCHER

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## Education

### Hanyang University

B.S. IN ROBOT ENGINEERING, MINOR IN ELECTRONIC ENGINEERING

Ansan, South Korea

Mar. 2018 - Feb. 2023

- GPA: 3.91 / 4.5

## Experience

### Roboe Technologies

SOFTWARE ENGINEER, MOTION ALGORITHM TEAM

Seoul, South Korea

Mar. 2024 - Present

- Conveyor Workspace Optimization for Mobile Robots**
  - Developed a workspace analysis framework for a conveyor-mounted mobile robot on reachability area.
  - Constructed a system model and cost-function optimization to minimize uncovered workspace regions based on reachability data.
- Jamming detection system**
  - Developed an algorithm to detect conveyor jamming using robot geometric information.
  - Optimized the PointCloud2 filtering algorithm to operate within 0.05 Hz.
- Predictive Collision Shield System**
  - Implemented a velocity-based Predictive Collision Shield using MoveIt2's FCL collision detection module
- Motion Task Framework Development**
  - Reconstructed Behavior Tree into a graph-based architecture for better flexibility
  - Solved Python GIL limitations using Ray-based multiprocessing
  - Implemented shared process communication between main and child processes for efficient data exchange
- Trajectory Generator for Virtual Controllers**
  - Implemented motion planning algorithms for moveL and moveJ paths using C++

### Gole Robotics

INTERN, AUTONOMOUS DRIVING SOFTWARE

Seoul, South Korea

Aug. 2023 - Oct. 2023

- Developed a serial communication library
- Selected and tested sensors for autonomous driving
- Built a ROS2-based Docker development environment
- Recipient of the CES Innovation Award Honoree (2024).*

### Undergraduate Researcher, RAISE Lab(Prof. Youngmoon Lee)

RESEARCHED ROBOT PLANNING AND CONTROL SYSTEM FOR MOBILE ROBOT AND MANIPULATOR

Ansan, South Korea

Jan. 2023 - Feb. 2024

- Developed autonomous driving software architecture and ROS2-based development environment.
- Designed and implemented a serial communication library and conducted sensor evaluation for autonomous driving.
- Published two research papers at international and domestic conferences:
  - C. Choi, J. Kim, Y. Nam, Y. Lee, **Snapshot: Enabling Dynamic Human–Robot Interactions for Real-Time Computational Photography**, ACM/IEEE HRI 2024, Boulder, USA.
  - J. Kim, J. Park, H. Lee, S. Park, Y. Nam, G. Kwon, W. Jung, Y. Lee, **Separable Integrated Drone–Mobile Robot System for Unmanned Patrol**, ICROS 2023, Samcheok, South Korea.
- Recipient of the **ICROS 2023 Undergraduate Best Paper Award**.

## Publications

### **Snapshot: Enabling Dynamic Human–Robot Interactions for Real-Time Computational Photography**

ACM/IEEE HRI 2024

Boulder, USA

Chanyeok Choi, Jeonghan Kim, Yunjae Nam, Youngmoon Lee

2024

- Developed an end-to-end HRI system integrating perception, control, and computational photography for dynamic camera composition.
- Designed a control loop that minimizes the angular difference between human head pose and the robot TCP direction using head pose estimation.
- Implemented manipulator velocity control based on pseudo-inverse Jacobian formulation for real-time smooth camera motion.

## Separable Integrated Drone–Mobile Robot System for Unmanned Patrol

ICROS 2023

Samcheok, South Korea

Jeonghan Kim, Jongchan Park, Hayeon Lee, Suhwan Park, Yunjae Nam, Gihyeon Kwon, Woohyeon Jung, youngmoon Lee

2023

- Proposed a cooperative drone–mobile robot platform enabling energy-efficient patrol and terrain coverage.
- ICROS 2023 Undergraduate Best Paper Award

## Extracurricular Activity

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### IEEP Tanzania International Science Volunteer

Arusha, Tanzania

VOLUNTEER

Jan. 2024

- Participated in international science volunteer program
- Contributed to science education and cultural exchange

### HYMEC – Robot Making Club

Ansan, South Korea

CLUB CHAIRMAN

Jan. 2020 - Dec. 2021

- Served as club chairman for one year
- Organized the 4th and 5th Hackathon for mobile robot missions

### Tutoring Mentor

Ansan, South Korea

- Git
- ROS & ROS2
- Docker

## Honors & Awards

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### INTERNATIONAL AWARDS

Feb. 2024 **Innovation Award Honoree**, CES Innovation Awards

USA

### DOMESTIC AWARDS

Nov. 2023 **Minister of Science and ICT Award**, SW Talent Festival (National Capstone Competition)

South Korea

Aug. 2022 **2nd Place**, Ansan Young Innovators Design Thinking Workshop

South Korea

Jul. 2022 **1st Prize**, Cancer Patient Care and Health Product Idea Competition

South Korea

Aug. 2021 **1st Prize**, ODA Idea Competition

South Korea

## Skills

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**Programming Language** C/C++, Python

**Frameworks & Tools** ROS2, ROS1, Git, Docker

**Used Robots** UR e-Series, RB20, TM20, mobile robot