



SOONHYUK KANG

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Education

KwangWoon University

Expected Graduation Date: Feb 2026

GPA: 4.16/4.5

Major GPA: 4.21/4.5

Bachelor of major Robotics

Work Experience

Hazardous and Extreme Environment Robotics Lab @HERO

Jun 2025 – Aug 2025

Intern

- Imported a SLAM baseline into the lab's underwater simulation environment

Robotics & A.I. Lab @RAIL

July 2024 – Jun 2025

Student Intern

- Research on SLAM
- Participated in the VLM-based project

Magnetic Robotics Lab @MRL

Jan 2024 – July 2025

Student Intern

- Research on Magnetic Robot

Projects

Deep Learning-based Lane Tracking and Traffic Sign Recognition System –

Oct 2025 – Nov 2025

Raspberry Pi Autonomous Driving
[Team Leader]

- Built a real-time autonomous driving system on Raspberry Pi 5 using multi-threaded lane tracking and YOLO-based traffic-sign detection.
- Applied dual PilotNet lane models (Left/Right) and switched models dynamically based on sign recognition results for reliable maneuvering.
- Enhanced on-device performance through ROI-based preprocessing and hardware-aware model optimization.

Underwater SLAM Baseline Import

Jun 2025 – Aug 2025

- Imported a SLAM baseline into the lab's underwater simulation environment.
- Extracted datasets from simulation for evaluation.
- Set up the imported baseline as a reference for comparison with the lab's SLAM system.

Autonomous Mobile Robot for Target Search Based on LLM
[Team Leader]

Jan 2025 – Aug 2025

- Developed an indoor autonomous robot that integrates LLM and SLAM to search for missing targets based on natural language descriptions.
- Applied a modified Bayesian approach to infer location probabilities from human traits interpreted by the LLM.
- Generated search priorities and executed autonomous navigation using Cartographer-based SLAM and ROS2 communication.

Home Sign Language Assistant Robot Using Turtlebot

Apr 2025 – Jun 2025

- Developed a home assistant robot that recognizes sign language commands and performs actions
- Built indoor 2D SLAM maps using Cartographer and tuned parameters for stable navigation.
- Linked sign command interpretation with navigation and object grasping using ROS2.

Cross-View Place Recognition Using Vision-Language Models

Jul 2024 – Oct 2024

- Performed cross-view image matching for visual place recognition (VPR) using CLIP and ViT-based VLM.
- Generated image-text embeddings via semantic captioning and Transformer-based feature extraction.
- Enhanced top-1 recall accuracy by aligning features across viewpoints through language-guided cues.

User-Customized Plating using Vision Technology

Aug 2024 – Dec 2024

- Designed a real-time kiosk system integrating RealSense cameras and socket communication.
- Trained object detection models using YOLO and applied them for fruit classification.
- Implemented data validation and optimized system accuracy using Python.

Robot Arm Control System: Implementation of Kinematics, Simulation, and Control

Oct 2024 – Dec 2024

- Developed a simulation UI for robot arm kinematics using ODE.
- Implemented motor control algorithms and real-time communication with ODE.
- Verified simulation accuracy through real-time joint angle control.

A mobile robot equipped with multiple sensors [Team Leader]

Mar 2024 – Jun 2024

- Conducted the project using the C language.
- Developed a mobile robot with Atmega 128 as the main controller and equipped it with six sensors for operation
- Each sensor operated using the PWM method.

Line Tracer

Sep 2023 – Dec 2023

- Conducted the project using Matlab.
- Used an LED to detect black lines and navigation.
- Processed the detected data through normalization to minimize oscillation.

Publication

강순혁, 김선국, 위민재, 진철호, 오정현, "베이지안 추론과 비전 인지를 결합한 LLM 기반 자율 탐색 모바일 로봇," in 한국로봇종합학술대회(KROC), 2026년 2월

I Made Putra Arya Winata, 왕진훈, 강순혁, 오정현, "장소 인식을 위한 시각 언어 모델 추출 기반 교차 시점 접근법," in 한국로봇종합학술대회(KROC), 2025년 2월

Awards

Poster – First Prize, Match-Up Advanced Program Competition, Kwangwoon University	Dec 2025
Report – Second Prize, Match-Up Advanced Program Competition, Kwangwoon University	Dec 2025
Participation prize, ICT Hanium DreamUp	Nov 2025
Dean's List (Academic Excellence), Kwangwoon University	Apr 2025
Excellence Prize, 2024 Intelligent Robot WE-Meet Project Integrated Competition	Dec 2024

Research Interest

Autonomous driving

Reinforcement Learning

SLAM

Skills

Programming: C++ / C, Python

Language: Korean, English (TOEIC : 750)