



# Woongje Cho

UNDERGRADUATE RESEARCHER · EMBODIED AI / AUTONOMOUS DRIVING

Gangdong-gu, Seoul, Rep. of KOREA

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## Education

### Yonsei University

B.S. IN MECHANICAL ENGINEERING

Seoul, S.Korea

Mar. 2021 - Expected Aug. 2026

- Total GPA: 3.75/4.5 (Major GPA: 3.78/4.5)
- Currently 4th year, 2nd semester

### Joongdong High School

HIGH SCHOOL DIPLOMA

Seoul, S.Korea

Feb. 2017 - Feb. 2020

## Research Experience

### MLCS (Machine Learning & Control Systems) Lab, Yonsei University

Seoul, S.Korea

RESEARCH INTERN (ADVISOR: PROF. JONGEUN CHOI / MENTOR: RESEARCHER HYEONGWOO NAM)

Present

- Developing a collaborative multi-agent LLM framework combining PDDL symbolic planning and ontology-based knowledge graph for long-horizon robot task planning in large-scale indoor environments.
- Designed prompt strategies and few-shot configurations across four specialized LLM agents; built experimental infrastructure on 3D scene graph environments with varying scales and task difficulties.
- Graduation thesis (solo): Comparative study of Knowledge Graph vs. 3D Scene Graph for semantic retrieval — KG achieved 3x accuracy improvement (40%→87%), proposed dual-track retrieval strategy.
- Stack: LangGraph, GPT-4o, Neo4j, OWL Ontology, Sentence-BERT, Python

## Projects & Competitions

### Phy-AI 26 Hackathon (Kernel Academy / FastCampus)

Seoul, S.Korea

TEAM LEAD (P1) — 2ND PLACE (BEST EXCELLENCE AWARD)

Mar. 2026

- Led Team GR00T (5 members) in a 26-hour hackathon to build "AI Pharmacy Copilot" — a voice-controlled medication dispensing cobot.
- Hardware: Doosan E0509 (6-DOF) + ROBOTIS RH-P12-RN-A Gripper + Intel RealSense D455, GPU 3090x8
- Designed three-tier AI strategy: A-Plan (GR00T N1.6 VLA, 3B), B-Plan (SmolVLA, 450M), C-Plan (SAM2 + GPT-4o + classical control) — C-Plan deployed for live demo.
- Built perception pipeline: Whisper STT → GPT-4o task decomposition → SAM2-tiny zero-shot segmentation → 24-point least-squares calibration ( $\pm 6.2\text{mm}$ ) → gripper control.
- Implemented CoT verification with auto-recovery: pick success ~80%, with retry ~95%.

### A1 Challenge (National Autonomous Driving Competition)

Seoul, S.Korea

AI OPERATOR — FINALIST (TOP 10 / 28 UNIVERSITIES)

Present

- E2E autonomous driving with 5 FHD cameras only (no LiDAR/GPS) for high-speed racing.
- Optimized inference pipeline from 5–10 FPS to 30+ FPS via model compression and pipeline optimization.
- Designed CBF-based safety constraints; currently competing in the finals.

### F1tenth Korea 2025

Seoul, S.Korea

TEAM LEADER & HARDWARE LEAD

Nov. 2025

- Led YAD team: Jetson Orin Nano + LiDAR (10Hz) + IMU (200Hz) with ROS2 time-sync integration.
- SLAM-based mapping combined with reinforcement learning for driving strategy; sim-to-real deployment.

### HL FMA Autonomous Driving Competition (aMAP Innovator Championship)

Seoul, S.Korea

INTEGRATED SYSTEM LEAD & HW/SW ENGINEER — ENCOURAGEMENT PRIZE

Jul. 2025 - Sep. 2025

- Led full-stack development: GPS autonomous driving, lane/signal recognition, parallel/T-shape autonomous parking.
- Designed vehicle platform with GPS RTK ( $\pm 2\text{cm}$  accuracy) and waypoint following algorithm.
- Resolved LiDAR false-positive issue (6–7/10 runs) via point-cloud intensity filtering, reducing false detections by ~80%.
- Managed platform swap crisis 1 week before competition; 3D-printed waterproof covers during rain.

## Honors & Awards

Mar. 2026 **2nd Place (Best Excellence Award)**, Phy-AI 26 Hackathon (Kernel Academy / FastCampus)

Seoul, S.Korea

Sep. 2025 **Encouragement Award (Top 10)**, HL FMA Autonomous Driving Competition (aMAP Innovator Championship)

Seoul, S.Korea

# Extracurricular Activity

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## YAX (Yonsei Autonomous Extension) — Physical AI Crew

Seoul, S.Korea

FOUNDER & LEAD

Oct. 2025 - Present

- Founded Yonsei's first Agentic & Physical AI crew across 3 departments (ME, EE, CS); grew from 1st cohort (8) to 2nd cohort (17 members).
- Operating F1 tenth racing and 1/5-scale EV projects; achieving competition awards and submitting papers to domestic/international workshops.
- Secured research grants via strategic partnership with Hyundai Motor Company.

## VAR (Vision AI & Control Robotics)

Seoul, S.Korea

TRAINEE

Jun. 2025 - Aug. 2025

- Studied computer vision algorithms and control theory for robotic applications.
- Completed hands-on mini-projects integrating vision pipelines with basic control loops.

## H-Mobility Class (Hyundai NGV)

Seoul, S.Korea

TRAINEE

Apr. 2025 - Jul. 2025

- Completed Autonomous Driving Basic and Advanced Courses.
- Acquired practical knowledge of perception, planning, and control for autonomous vehicles.

## JSA (Joint Security Area) Security Battalion — Panmunjom

Panmunjom, S.Korea

SQUAD LEADER & TOUR BRIEFING OFFICER / SERGEANT

Aug. 2022 - Feb. 2024

- Served as tour security guard and briefing officer at Panmunjom (JSA); managed diverse tour groups with English communication.
- Honorable discharge (Man-ki).

# Skills

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## Robotics & Autonomy

ROS2, C++, Python, PyTorch, Linux, Docker, GPS RTK, LiDAR, IMU, Doosan Cobot, Isaac Sim

## AI & Research

Agentic AI, Physical AI, VLA (GR00T, SmoIVLA), LLM, SAM2, Neo4j, LangChain/LangGraph, PDDL, Sentence-BERT

## Fields

Autonomous Driving, Robotics, Embodied AI, Scene Graph Reasoning, AI Planning, Cobot Applications