Curriculum Vitae

Seungmin Lee (이승민)

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Profile

- Expertise in autonomous systems, robotics, and computer vision
- Proficiency in developing and deploying real-time perception (object detection/segmentation) and control algorithms on embedded systems (Jetson Orin Nano)
- Experience with transformers architecture by using Whisper model for voice recognition
- Experience in full-stack application development

Education

Konkuk University | Seoul, South Korea
B.S. in Mechanical Engineering (Expected Aug 2026)

- **Overall GPA:** 3.50 / 4.50 (Until 7th Semester)
- **Major GPA:** 3.54 / 4.50 (Until 7th Semester)
- **Rank:** Top 26% (Until 7th Semester)

Selected High-Grade Coursework:

Subject	Grade	Subject	Grade
Self-Designed Semester Project	Ongoing	Application of Mechanical-AI	Ongoing
Introduction to Future Automotive Engineering	A+	Problem Solving through Programming	A+
Capstone Design (E)	A	Computational Thinking	A+
System Modeling & Design	A	Understanding Artificial Intelligence	A

Research Experience

Korea University MINT LAB | Seoul, South Korea
Undergraduate Research Intern (Present)

- Developed a real-time visualization framework for the LeRobot library's LIBERO evaluation pipeline to enable live monitoring of policy execution.
- Designed and implemented training scripts and data preprocessing pipelines tailored to the lab's Vision-Language-Action (VLA) model architecture.
- Constructed robot hardware structure XML files in MuJoCo simulation and configured a teleoperation environment for data collection and control validation.

Awards & Honors

- **Hanwha National Defense Award (2nd Place, Sponsored by Hanwha AeroSpace)** | The 2025 Army Chief of Staff Cup (09/2025)
- **1st Place** | 2025 Hanyang University Consortium Creative Capstone Design Competition (11/2025)
- **2nd Place** | The 4th International University Student EV Autonomous Driving Competition (07/2025)
- **4th Place** | aMAP Innovator Championship (09/2025)
- **2025 Dean's List** (07/2025)
- **Bronze Award** | The 4th Dalseo National University Student Invention Idea Contest (08/2024)

- **Design Award** | The 3rd Future Automobile Software Contest (08/2024)

Language Skills

- **TOEIC:** 885
- **OPIC:** IH (Intermediate High)

Research Objective

- To conduct graduate-level research on the development, generalization, and optimization of Vision-Language-Action (VLA) models for general-purpose robotics.

Research Interests

My primary research interest lies in the intersection of perception, language, and robotics. Inspired by foundational works such as "Attention Is All You Need," & "OpenVLA: An Open-Source Vision-Language-Action Model". I am keenly focused on developing and understanding Vision-Language-Action (VLA) models. I aim to explore how multi-modal transformer architectures can enable robots to perform complex, long-horizon tasks from natural language instructions, moving beyond specialized systems toward more generalized and adaptable robotic intelligence.

- Vision-Language-Action (VLA) Models
- Embodied AI & Foundation Models for Robotics
- Robotic Manipulation and Generalization

Projects & Technical Experience

(Prioritized by relevance and key achievements)

The 2025 Army Chief of Staff Cup National Defense Robot Competition

Software Team Lead (07/2025 - 09/2025)

- **Achievement:** Secured the Hanwha National Defense Award (2nd Place).
- ***Repository:*** DolbotX
- Architected a mission-critical perception system for autonomous pick-and-place operations.
- Engineered a high-accuracy pipeline integrating a custom YOLOv8 model with multi-class driving area segmentation.
- Spearheaded the successful integration of the vision module with robotic manipulator controls for precise autonomous execution.

2025 Hanyang University Consortium Creative Capstone Design Competition

Speech Recognition Developer (11/2025)

- **Achievement:** Secured 1st Place in the competition.
- Developed a speech recognition and text extraction algorithm utilizing OpenAI's Whisper library.
- Implemented noise attenuation filters to enhance recognition accuracy in noisy environments.

The 4th Int'l University Student EV Autonomous Driving Competition

Team Lead, Perception (01/2025 - 07/2025)

- **Achievement:** Led team to 2nd Place among 26 international universities.
- ***Repositories:*** Team / Personal - YOLOTL
- Directed the development of a real-time lane segmentation and decision module on an embedded system (ABKO APC 850) for a full-scale EV.
- Modified the YOLOPv2 architecture for real-time performance to extract critical lane data for vehicle control.
- Innovated by creating a large-scale, custom Bird's-Eye-View (BEV) lane dataset and training a novel model (YOLOTL).
- Integrated the vision system with ROS for path generation and a pure pursuit lateral controller.

aMAP Innovator Championship 2025 [1/5]

Team Lead, Vision Systems (09/2025)

- **Achievement:** Earned 4th Place out of 38 highly competitive teams.
- Designed and implemented a robust computer vision system to accurately detect a 1/5 scale vehicle and classify a 4-sign traffic light.

Self-Designed Semester Project: DolbotX Robot Platform

Project Lead (09/2025 - Present)

- Developing the "DolbotX" general-purpose robot platform by integrating advanced perception (CV) and control modules into a versatile, autonomous system.

Graduation Project: CARLA Autonomous Driving Base Controller

System Lead (03/2025 - 07/2025)

- ***Repository:*** CARLA Base_Controller
- Integrated the CARLA simulator with ROS1 via a ROS bridge.
- Designed and validated a base controller (PID for longitudinal, Pure Pursuit for lateral) as a critical fail-safe for high-level controller failure.

Technical Skills

Category	Skills
Programming Languages	Python, C++, CLI
Frameworks & Libraries	Lerobot, PyTorch, ROS, ROS2 (Robot Operating System), OpenCV, NumPy, Ultralytics, Mujoco
Core Competencies	Object Detection/Lane Segmentation (YOLOv8, YOLOPv2), Algorithm Development, Robotics Integration, Machine Learning
Developer Tools	Git, GitHub, Hugging Face, Linux, VS Code