Eunchong Kim

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전문연구요원 보충역 신규 편입 대상 (본인 TO 보유)

RESEARCH INTEREST

Autonomous Driving: End-to-End Stack & Perception Systems

EDUCATION

Ulsan National Institute of Science and Technology (UNIST)   Ulsan, Republic of Korea

M.S. in Artificial Intelligence   *Sep. 2023 - Feb.2026*

- GPA: 4.05 / 4.3
- Advisor: Prof. Jeong hwan Jeon (Robotics and Mobility Lab.)
- Thesis: End-to-End Autonomous Driving: Deployment-Oriented and Rule-Conformant Design

Jacobs University Bremen (Currently Constructor Univeristy)   Bremen, Germany

B.Sc. in Robotics and Intelligent Systems   *Sep. 2020 - Jun. 2023*

- GPA: 1.52 / 1.0 (German Scale) ≈ 3.5 / 4.0 (U.S. GPA)
- Advisor: Prof. Francesco Maurelli
- Thesis: Event-Based Motion Segmentation and Stereo Feature Matching in Highly Cluttered Environments (Collaborative research with WasteAnt GmbH)
- Major Representative
- Merit-based Scholarship (€5,000 per year)

PUBLICATION

Eunchong Kim*, Heedon Jeong*, Sungjun Heo**, Sunhwi Kim**, Seongjae Lee**, Jaichan Shin**, Heecheol Yoo, and Jeong hwan Jeon, "Deployment-Oriented End-to-End Autonomous Driving: Enhancing Closed-Loop Stability with a Lightweight Camera-Only Framework," in Proc. of the IEEE Intelligent Vehicles Symposium (IV), 2026. (Accepted)

PROJECTS

2025 Hyundai Motor Group Autonomous Driving Challenge   *Oct. 2024 - Sep. 2025*
1st Round: 3rd place (Team member) (₩5M Prize)
2nd Round: 1st place (Team leader) (₩30M Prize, Recruitment perks, China Tech Tour)

- <u>Continuous Optimization</u>: Drove performance gains through a feedback loop: Performance Analysis → Data-driven and model-centric improvements → Re-training & Evaluation.
- <u>Deployment-Oriented E2E Model Development</u>: Developed an E2E model from scratch, targeted for NVIDIA Jetson AGX Orin. Balanced real-time performance and functionality by selectively integrating essential driving modules through trade-off analysis between computational cost and performance gains.
- <u>Conflict-Free Multi-Task Learning</u>: Developed a training-only auxiliary module to resolve task-wise prediction conflicts, ensuring physically plausible outputs without inference overhead.
- <u>Latency-Compensated Labeling</u>: Implemented a latency-aware labeling policy to compensate for the temporal gap between sensor input and actual actuation.
- <u>Real-time Deployment</u>: Achieved an inference speed of 16Hz on NVIDIA Jetson AGX Orin.
- <u>Tech. Stacks</u>: BEV Segmentation, 3D Object Detection, Vectorized Map Construction, Transformer-based Planning and Control.

Full-Stack End-to-End Autonomous Driving System Development (Research Project | UNIST AI Graduate School)
April. 2025 - Sep. 2025

- <u>Project Title</u>: Development of an End-to-End Autonomous Driving Framework Using a High-Fidelity Simulator.
- <u>Automated Data Collection & Evaluation Pipeline</u>: Developed a random scenario generator, an automated loop for data collection, and model evaluation to minimize manual intervention.
- <u>Position-Gated Mixture-of-Experts Architecture</u>: Implemented a position-based gating network to route features to specialized experts for diverse domains, including urban and highway environments, improving domain-specific driving performance.

BEV-based Lane Detection for ERP42
Dec. 2023 - Feb. 2024

- <u>Real-time BEV-Centric Lane Detection</u>: Developed a lightweight lane detection system to transform perspective inputs into a unified Bird's-Eye View. Ensured high-speed performance on ERP42's low-resource onboard system for downstream planning.

Multi-Teacher Knowledge Distillation based Pedestrian Detection
Aug. 2023 - Dec. 2023

- <u>Custom Data Generation via Pseudo-labeling</u>: Synthesized high-quality Ground Truth for diverse domain-specific datasets using pseudo-labeling, maximizing data efficiency and minimizing labeling cost.
- <u>Performance-Efficiency Optimization via MTKD</u>: Resolved accuracy-speed trade-off by distilling knowledge from multiple domain-specific teachers into a lightweight student model. Achieved a 16% mAP gain over fine-tuning while maintaining real-time inference.

Truck-Discharging Waste Segmentation using Event Camera Data
Jan. 2023 - Jun. 2023

- <u>Spatio-temporal Segmentation:</u> Developed an event-based segmentation algorithm to overcome motion blur in frame-based cameras. Leveraged temporal cues to ensure precise anomalous waste detection in incineration plants.
- <u>Event-RGB Stereo Matching</u>: Applied homography-based matching to project segmentation masks into RGB images for intuitive spatial visualization and evaluation.

Event-based Vehicle Tracking in Highway Surveillance System
Jun. 2022 - Aug. 2022

- <u>Efficient Tracking</u>: Developed a low-cost, event-seeking clustering-based tracking algorithm for highway surveillance. Ensured energy efficiency and robust performance by overcoming RGB motion blur in high-speed scenarios.

AWARDS

Excellence Award | AI Tech Open Workshop (UNIST AI Graduate School)
Sep. 2025

- Project Title: Development of an End-to-End Autonomous Driving Framework Using a High-Fidelity Simulator.

1st Place | 2025 Hyundai Motor Group Autonomous Driving Challenge
Sep. 2025

- 1st Place in the 2nd Round of HMG End-to-End Autonomous Driving Challenge (Team: FAST).

3rd Place | 2025 Hyundai Motor Group Autonomous Driving Challenge
Mar. 2025

- 3rd Place in the 1st Round of HMG End-to-End Autonomous Driving Challenge (Team: FAST).

ACADEMIC EXPERIENCE

Reviewer | 2026 IEEE Intelligent Vehicles Symposium (IV)
Nov. 2025

**WORK &
TEACHING
EXPERIENCES**

Ulsan National Institute of Science and Technology

Teaching Assistant   Spring 2024, Spring 2025

- AI Programming I

Research Intern   Jun. 2022 – Aug. 2022

- Robotics and Mobility Lab.

WasteAnd GmbH   Oct. 2022 – Jun. 2023

Working Student

Jacobs University Bremen (Currently Constructor University)   2021 – 2023

Teaching Assistant

- Algorithms and Data Structures (C++)
- Programming in C/C++
- Embedded Systems
- Introduction to Robotics and Intelligent Systems Lab (Arduino)

SKILLS

Languages

- Korean   ●●●●●
- English   ●●●●●
- German   ●●○○○

Programming Languages

Python, C++

Frameworks & Libraries

PyTorch, OpenCV, Pandas, NumPy

Tools & Platform

ROS, Git, Docker, MORAI simulator