DAEIL HAN

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SUMMARY

I am a Master's student at Seoul National University of Science and Technology (SEOULTECH), focusing on end-to-end planning for autonomous driving. My research addresses future prediction of vehicle occupancy and motion flow in bird's-eye view (BEV), and enhances camera-only models via knowledge distillation from LiDAR-camera fusion. I have experience working across the perception-to-planning pipeline, including model development, evaluation, and simulation-based validation.

SKILLS

Languages:
Python, C++, C

Frameworks & Tools:
PyTorch, TensorFlow, ROS, Git, Docker

Certifications:
TOEIC 900

EDUCATION

Sep. 2024 – Present
Master of Applied Artificial Intelligence — ***Seoul, Korea***
Seoul National University of Science and Technology
- Expected graduation: Feb. 2026

Mar. 2021 – Aug. 2024
Bachelor of Applied Artificial Intelligence, Computer Science and Engineering — ***Seoul, Korea***
Seoul National University of Science and Technology
GPA: 4.13 / 4.50

EXPERIENCE

Sep. 2023 – Present
Research Assistant — **Computer Vision Laboratory, SEOULTECH**

- **Cross Modality Knowledge Distillation for Autonomous Driving**: Designing a unified cross-modal distillation framework to improve camera-based 3D object detection by transferring knowledge from a LiDAR-based teacher. The method introduces attention-guided orthogonal alignment and cross-head response distillation to align BEV features and enforce consistency across modalities.
- **Camera-based End-to-End Autonomous Driving**: Building a closed-loop vision-based autonomous driving framework that predicts control commands (Accel, Brake, Steer) from raw images. The system integrates a pretrained model with a nuScenes-style dataset, ROS communication, and the MORAI Simulator for real-time evaluation.
- **Machine Learning Force Fields**: Developing a force field model to predict total energy, per-atom forces, and predictive uncertainty from atomic point cloud data. The system is evaluated using a composite metric combining energy-force accuracy and OOD detection performance for active learning-based molecular simulation.
- **Occupancy and Flow Prediction**: Designing a spatiotemporal BEV-based network to predict future occupancy and motion flow in autonomous driving scenarios. To improve temporal alignment and spatial accuracy, I introduced a cost aggregation mechanism using cosine similarity and transformer attention, combined with a temporal MetaFormer encoder and multi-scale feature fusion.

Jun. 2025 – Jul. 2025
Technical Assistant, Hyundai Motor Group Big Data Bootcamp — **Elice Inc.**

- Assisted employees from Hyundai Motor Group and its affiliates with big data analysis and computer vision projects, providing technical guidance and implementation support.
- Responded to questions, evaluated project progress, and diagnosed issues faced by participants.

Mar. 2024 – Jun. 2025
Operating Systems Teaching Assistant — **Dept. of Applied A.I., SEOULTECH**

- Supported students with coursework, answered questions, and assisted in exam review and grading.
- Designed, evaluated, and provided feedback on xv6 file system assignments, including implementations of indirect indexing.

Jun. 2023 – Nov. 2023

Mentor, KT Online Evening School — **KT Corporation & Seoul Metropolitan Government**

- **AI Tutoring**: Provided grouped instruction on AI fundamentals and guided middle school students in using basic AI tools and logic-based problem solving.
- **Basic Subjects Tutoring**: Delivered remote learning sessions in mathematics and English, adapting materials to middle school student levels and needs.
- Maintained regular communication with middle school students and their parents, tracked academic progress, and submitted activity reports.

Aug. 2022 – Aug. 2023

Mathematics Teaching Assistant — **School of Liberal Arts, SEOULTECH**

- **Probability and Statistics**: Answered student questions, designed quizzes, and graded assignments and assessments.
- **Calculus**: Provided academic support to students, created quiz questions, and assisted in grading coursework.

AWARDS

Mar. 2025

2025 Hyundai Motor Group Autonomous Driving Challenge — **Hyundai Motor Group**

- Building a closed-loop autonomous driving framework based on an end-to-end model, capable of predicting Accel, Brake, and Steer commands from raw images.
- Reconstructing the training pipeline on a nuScenes-style dataset, integrating the model with the MORAI Simulator via ROS for real-time evaluation.
- Responsible for system integration and model engineering excluding control and data generation modules.
- 5th Place

Oct. 2024

2024 Samsung AI Challenge: Machine Learning Force Fields — **SAIT**

- Developing a machine learning force field (MLFF) model to approximate quantum-level simulations by predicting total energy, per-atom forces, and predictive uncertainty from atomic structures.
- Evaluated on a proprietary semiconductor dataset using a composite metric combining energy-force RMSE and OOD AUROC.
- 2nd Place

Jun. 2024

2024 Waymo Open Dataset Challenge – Occupancy and Flow Prediction — **Waymo**

- Predicting dense BEV occupancy and motion flow for all road agents using 1-second observation from the Waymo Open Motion Dataset.
- Submitted a hierarchical spatiotemporal model featuring temporal MetaFormer encoding and autoregressive decoding.
- 2nd Place

Dec. 2023

SEOULTECH Capstone Design Expo – Department of Applied AI — **SEOULTECH**

- Designing a mobile application that recognizes animal species from user-taken photos, builds a personalized wildlife encyclopedia, and enables user interaction through community features.
- Responsible for frontend development and application architecture, including feature design, user flow, and project coordination.
- 1st Place

PUBLICATIONS

International Conference

- Gaeun Kim*, **Daeil Han***, Yeong Jun Koh, and Hanul Kim. "DualDistill: A Unified Knowledge Distillation Framework with Cross-Modal Feature Alignment for Camera-Based 3D Object Detection." in ICCV, submitted.

International Journal

- Gaeun Kim*, **Daeil Han***, Yeong Jun Koh, and Hanul Kim. "DualDistill: A Unified Knowledge Distillation Framework with Cross-Modal Feature Alignment for Camera-Based End-to-End Autonomous Driving." IEEE TPAMI, in writing.
- **Daeil Han***, Gaeun Kim*, Yeong Jun Koh, and Hanul Kim. "Spatiotemporal Occupancy and Flow Prediction with ConvGRU and Similarity Alignment." IEEE Access, in writing.

Domestic Conference

- Yerang Lee, Minki Jeong, **Daeil Han**, and Beom-Seok Oh. "A Hierarchy Loss Function for Animal Image Classification Performance Enhancement." 2024 대한전자공학회 학술대회, 제주.
- Minki Jeong, Yerang Lee, **Daeil Han**, and Beom-Seok Oh. "Focus and Weave It: SR-GNN Lightweight for Mobile Vision Applications." 2024 대한전자공학회 학술대회, 제주.