






# Kyuhwan Yeon

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 [Google Scholar](#) 

## Research Interests

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Robotics, Machine Learning, Autonomous Driving, Motion Planning & Control, Prediction, Optimization

## Education

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**Hanyang University, Seoul** Mar 2017 – Feb 2019

*M.S. in Automotive Electronics and Control Engineering*

- GPA: 4.0/4.0
- Full Scholarship Recipient
- Research Topic: Machine Learning-based Speed Prediction, Intelligent Driver Model for Automated Vehicles
- Teaching Assistant: Microprocessor Applications, Embedded System (Undergraduate & Graduate Courses)

**Hanyang University, Seoul** *B.S. in Automotive Engineering* Mar 2011 – Feb 2017

- GPA: 3.51/4.0
- Full Scholarship Recipient
- Note: Military Service from March 2012 to March 2014

## Publications

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- [1] **K. Yeon**, H. Kim, and S. -G. Jeong, "SpeedFormer: Learning Speed Profiles with Upper and Lower Boundary Constraints Based on Transformer," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023. - *Conference*
- [2] S. Moon, S. Lee, H. Woo, **K. Yeon**, H. Kim, S. -G Jeong, J. Kim, "RUF1: Reducing Uncertainty in behavior prediction with Future Information", Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR Workshops), 2023. - *Workshop*
- [3] J. Shin, **K. Yeon**, S. Kim, M. Sunwoo and M. Han, "Comparative Study of Markov Chain With Recurrent Neural Network for Short Term Velocity Prediction Implemented on an Embedded System," in IEEE Access, 2021 - *Journal*
- [4] K.Min, **K. Yeon**, Y.Jo, Vehicle Deceleration Prediction Based on Deep Neural Network at Braking Conditions. International Journal of Automotive Technology, 2020 - *Journal*
- [5] **K. Yeon**, K.Min, J.Shin, Ego-Vehicle Speed Prediction Using a Long Short-Term Memory Based Recurrent Neural Network. International Journal of Automotive Technology, 2019 - *Journal*, **90 times cited**

## Experience


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**Motion Planning Engineer**

Seoul, Korea

42dot (Hyundai Motor Group's subsidiary)

Apr 2020 – Present

- **AD/ADAS for production cars (Aug 2023 – Present):** Developed Level 2+/3 autonomous driving algorithms for mass-production vehicles.
  - Designed a neural motion planner for optimized trajectory generation in real-time.
  - Built high-accuracy motion prediction models comparable to Waymo/Argoverse2 leaderboards.
  - Created scalable continuous learning pipelines for motion prediction.
  - Developed advanced lane-change algorithms using data-driven approaches.
- **Robo-shuttle (May 2022 – Sep 2023):** Launched an autonomous shuttle service in crowded urban areas. [Video](#) 
  - Built agent-centric motion prediction models for urban environments.
  - Developed an NPU/GPU-based inference engine for motion prediction networks.

- Designed custom annotation tools for motion prediction.
- **Robo-taxi (Apr 2020 – Jul 2022):** Contributed to the deployment of a top-ranked autonomous taxi service in Korea. [Video](#) [🔗](#)
  - Designed Level 4 motion planning algorithms using MPC frameworks.
  - Implemented multi-target speed planning and vision-based EKF localization.

### Research Engineer

Hyundai Motor Company

*Hwaseong, Korea  
Jan 2019 – Apr 2020*

- Developed deep learning-based cylinder air charge estimation algorithms for internal combustion engines.

### Intern

GNS America

*Michigan, USA  
Jul 2015 – Dec 2015*

- International internship program

## Key Projects

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### Motion Prediction

*2022 - Present*

- Developed scene-centric, agent-centric, and goal-based motion prediction models
- Guarantee real-time performance with high accuracy in embedded systems (NPU / GPU)
- One of the results was presented in the 2023 CVPR workshop.

### Neural Motion Planner

*2022 - 2023*

- Developed a novel Transformer-based network for motion planning, and published in IROS 2023
- Capable of generating 1,024 optimized trajectory candidates within 30ms in urban scenarios, significantly increasing the probability of finding optimal trajectories while successfully imitating MPC (Model Predictive Control) results. [Video](#) [🔗](#)

### Ego-Vehicle Speed Prediction

*2019 - 2021*

- Developed a Long Short-Term Memory (LSTM) based Recurrent Neural Network for ego-vehicle speed prediction.
- Successfully implemented on an embedded system for a real vehicle test. [Video](#) [🔗](#)

## Awards and Activities

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- **Hyundai Motor Group Industry-Academia Scholarship (2017-2019):** Awarded for participation in a cooperative industry-academic research program.
- **Chungbuk Talent Development Foundation Scholarship (2016):** Awarded by the local government to students in the top 1% based on CSAT scores.
- **Entrance Academic Excellence Scholarship (2011-2016, Hanyang University):** Granted for outstanding academic performance throughout the undergraduate program.
- **Reviewer:** International Conference on Intelligent Robots and Systems (IROS 2023, IROS 2024).
- **Speaker:** Hyundai Motor Group Developer Conference 2024 on Neural Planner.

## Skills

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**Programming Languages:** C++ (production-level), Python (production-level), CUDA

**Frameworks and Libraries:** PyTorch, MLflow, TensorRT

**Simulation Platforms:** Applied Intuition, CARLA, MORAI

**Systems:** NVIDIA platforms, Qualcomm, Hailo

**OS:** Linux

**Robotics:** ROS, ROS2

**Optimization Solvers:** ACADO/ACADOS, CVXGEN, IPOPT