

Kyuhwan Yeon

[✉ Email](#) [🌐 Personal Website](#) [in LinkedIn](#) [🔗 Google Scholar](#)

Research Interests

My research focuses on developing scalable and interpretable robot learning algorithms for autonomous systems.

Keywords: *Robotics, Machine Learning, Motion Planning and Prediction, Control, Foundation Models*

Education

Hanyang University, Seoul *M.S. in Automotive Electronics and Control Engineering (GPA: 4.0/4.0)* Mar 2017 – Feb 2019

- Full Scholarship Recipient (Industry-Academia Scholarship)
- Research Topic: Autonomous Driving, Machine Learning, Control
- Teaching Assistant: Microprocessor Applications, Embedded System (Undergraduate & Graduate Courses)

Hanyang University, Seoul *B.S. in Automotive Engineering (GPA: 3.51/4.0)* Mar 2011 – Feb 2017

- Full Scholarship Recipient (Merit-based)
- Note: Military Service from March 2012 to March 2014

Professional Experience

42dot, a subsidiary of Hyundai Motor Group [\[Video\]](#) [🔗](#) *Autonomous Driving Algorithm Engineer* Seoul, Korea
Apr 2020 – Present

Hyundai Motor Company *Research Engineer, Control Systems* Hwaseong, Korea
Jan 2019 – Apr 2020

GNS America *Intern, International Internship Program* Michigan, USA
Jul 2015 – Dec 2015

Selected Research Projects

◦ Motion Prediction

- Designed and implemented *scene-, agent-, and goal-centric* motion prediction models for autonomous vehicles to forecast surrounding agent trajectories in complex urban environments without relying on HD maps. [\[Demo Video\]](#) [🔗](#)
- One of the developed models was presented at a CVPR Workshop.

◦ Neural Motion Planning

- Designed high-level decision-making and trajectory selection logic, tailored for safety and efficiency in real-world autonomous navigation.
- Developed a Transformer-based planning network for autonomous urban driving, capable of generating 1,024 optimized trajectory candidates within 30ms. Published at IROS. [\[Demo Video\]](#) [🔗](#)

◦ Control and State Estimation

- Engineered lateral and longitudinal control algorithms using Model Predictive Control (MPC), enabling smooth and responsive motion control in Level 4 autonomous vehicles.
- Implemented vision-aided localization based on Extended Kalman Filter (EKF), improving robustness and positional accuracy under urban driving conditions.
- Contributed to full-stack system integration across multiple vehicle platforms, including low-level control interfaces and deployment for public road operation.

Publications

- [1] S. Moon, **K. Yeon**, H. Kim, S. -G. Jeong, J. Kim, “Who Should Have Been Focused: Transferring Attention-Based Knowledge from Future Observations for Trajectory Prediction”, International Conference on Pattern Recognition (ICPR), 2024 - *Conference*
- [2] **K. Yeon**, H. Kim, 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*
- [3] 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*
- [4] J. Shin, **K. Yeon**, S. Kim, M. Sunwoo, M. Han, “Comparative Study of Markov Chain With Recurrent Neural Network for Short Term Velocity Prediction Implemented on an Embedded System,” IEEE Access, 2021 - *Journal*
- [5] K. Min, **K. Yeon**, Y. Jo, “Vehicle Deceleration Prediction Based on Deep Neural Network at Braking Conditions”, International Journal of Automotive Technology, 2020 - *Journal*
- [6] **K. Yeon**, K. Min, J. Shin, M. Sunwoo, M. Han, “Ego-Vehicle Speed Prediction Using a Long Short-Term Memory Based Recurrent Neural Network”, International Journal of Automotive Technology, 2019 - *Journal*, **99 times cited**
- [7] K. Min, **K. Yeon**, G. Sim, M. Sunwoo, “Prediction Algorithm for Decelerating Driving States Based on Driver Characteristics for Smart Regenerative Control of Electric Vehicles”, 8th Aachen Colloquium China Automobile and Engine Technology, 2018 - *Conference*
- [8] W. Kim, **K. Yeon**, S. -S. Lee, “Development of a Pitch Control Algorithm Through MRAC Based Longitudinal and Vertical Integrated Chassis Control”, Korean Society of Automotive Engineers, 2018 - *Poster*

Patents

- [1] **K. Yeon**, H. Kim, “Method, apparatus, and computer-readable medium for predicting a future trajectory of a target vehicle using movement information of one or more past surrounding vehicles”, Korean Patent, No. 1020220123725, 2025
- [2] S. Jeong, **K. Yeon**, I. Bae, H. Kwon, “Method, apparatus, and recording medium for estimating the location and pose of a vehicle”, Korean Patent, No. 1020220022032, 2023

Awards and Activities

- **Tech Advisor** (2025): Served as a technical advisor for the End-to-End Autonomous Driving Challenge at the Hyundai Motor Group Developer Conference (Pleos 25).
- **Speaker** (2024): Presented research on Neural Planner at the Hyundai Motor Group Developer Conference, attended by approximately 500 developers.
- **Reviewer** (2023–2024): International Conference on Intelligent Robots and Systems (IROS).
- **KAMA Academic Award** (2023): Received the best paper award from the Korean Society of Automotive Engineers (KSAE) and Korea Automobile & Mobility Association (KAMA) for publication [6].
- **Hyundai Motor Group Industry-Academia Scholarship** (2017–2019): Supported participation in a collaborative research program between Hyundai Motor Group and academia.
- **Chungbuk Talent Development Foundation Scholarship** (2016): Selected by the provincial government as one of the top 1% of students based on CSAT scores.
- **Entrance Academic Excellence Scholarship, Hanyang University** (2011–2016): Awarded for outstanding academic performance throughout the undergraduate program.

Skills

Languages: C++, Python, CUDA

Deep Learning: PyTorch, MLflow, TensorRT

Platforms: NVIDIA, Qualcomm, Infineon, Hailo

Robotics: ROS, ROS2

Simulation: Applied Intuition, CARLA, MORAI

Optimization: ACADO, OSQP, CVXGEN, IPOPT