

Jeongyong Yang

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Summary

M.S. candidate student in safety-critical control and planning under uncertainty for autonomous and robotic systems. My research integrates data-driven learning with formal safety guarantees to develop autonomy that is provably safe, scalable, and reliable. With a multidisciplinary background in mechanical, electrical, and computer engineering, I pursue the unification of learning, control, and formal verification toward trustworthy intelligent systems.

Education

Korea Advanced Institute of Science and Technology (KAIST)

M.S. Candidate in Electrical Engineering

Daejeon, Korea
Mar. 2024 – Present

- Advisor: Prof. SooJean Han
- GPA: 4.26 / 4.3

Hanyang University

B.S. in Automotive Engineering

Seoul, Korea
Mar. 2018 – Feb. 2024

B.S. in Convergence Technology for Advanced Vehicles (Dual Degree; Interdisciplinary Program in Computer Science)

- Advisor: Prof. Kunsoo Huh
- GPA: 4.24 / 4.5

Work Experience

ACEWORKS, Control Engineer Intern

Seoul, Korea
Jun. 2022 – Aug. 2022

- Implemented the fuel quantity calculation logic for the K2 tank engine in MATLAB/Simulink, covering modules such as engine start, speed control, drivability, fuel limitation, etc.
- Built a dashboard interface for vehicle status monitoring in C++.

Republic of Korea Army, Sergeant

Seoul, Korea
Apr. 2020 – Oct. 2021

- Air Defense Systems Maintenance

Publications / Preprints

- [1] **Jeongyong Yang**, Minseok Jeong, SooJean Han, and Hyo-Sang Shin, “Random Fourier Features Lifted Physics-Informed Koopman Network,” in *Proceedings of the Korean Society for Aeronautical & Space Sciences (KSAS)*, Nov. 2025. (in Korean)
- [2] **Jeongyong Yang***, Seunghwan Jang*, and SooJean Han, “[SafeFlowMatcher: Safe and Fast Planning using Flow Matching with Control Barrier Functions](#),” *arXiv preprint*, Oct. 2025. (under review at machine learning conference)
- [3] **Jeongyong Yang***, KwangBin Lee*, and SooJean Han, “[Heterogeneous Predictor-based Risk-Aware Planning with Conformal Prediction in Dense, Uncertain Environments](#),” *arXiv preprint*, Jul. 2025. (under review at ACC 2026)
- [4] **Jeongyong Yang**, Hoin Ju, and SooJean Han, “Curvature and Energy-based Trajectory Optimization in Unstructured Environments,” in *Proceedings of the Korea Robotics Society Annual Conference (KRoC)*, Feb. 2025. (in Korean)

(* Equal contribution)

Projects

KIAST: Risk Prediction and Safety Assessment of Drone Operations in Urban Environment

Jul. 2025 - Present

- Developed an uncertainty propagation method for drone using the duality between Peron-Frobenius and Koopman operators, leveraging data-driven Koopman modeling to es-

timate probabilistic risk regions for safe urban drone operations (related publication: [1]).

ETRI: Fail Detection and Self-Improving Systems for Robotic Tasks

May 2025 - Present

- Developed an out-of-distribution detection module for robotic manipulation tasks using conformal prediction and success-only data to ensure safe task execution and enable self-improving imitation learning.

Capstone Project: Lane Keeping System for Passenger-Trailer Vehicle

Mar. 2023 - Dec. 2023

- Modeled the error dynamics of an articulated passenger-trailer vehicle and designed a lane keeping controller based on Linear Quadratic Gaussian control.
- Applied a low-pass-filtered look-ahead curvature as a feedforward term to improve cornering stability and safety.
- Designed and validated the controller and estimator in MATLAB/Simulink, and verified performance through CarMaker simulations.

Vehicle Electronic Control: Electronic Stability Control (ESC)

Sep. 2023 - Dec. 2023

- Designed an ESC algorithm including desired yaw rate computation, entrance/exit criteria, and brake pressure control using MATLAB/Simulink.
- Generated embedded code for the Infineon XC167CI board and performed real-time testing on a dSPACE MicroAutoBox HIL system under a double-lane change maneuver.

Operating Systems: Kernel Extension of xv6

Mar. 2022 - Jun. 2022

- Implemented new system calls, Multilevel Queue/Multilevel Feedback Queue (MLQ/MLFQ) CPU schedulers, and lightweight process management in the xv6 operating system.

Peer Review Experience

3 papers in IEEE Robotics and Automation Letters (RA-L)

1 paper in IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Students Mentored

Mentored on vehicle dynamics and model predictive control

- Hohyeon Song (Electrical Engineering, KAIST)

Mentored on linear systems and control theory fundamentals

- Yongmin Kim (Electrical Engineering, KAIST)
- SeungEon Lee (Electrical Engineering, KAIST)

Mentored on computational thinking, data structures, and programming fundamentals

- Hongryeol Lim (Mechanical Engineering, Hanyang University)

Scholarships

Hanyang Brain (Academic Excellence) Scholarship, Hanyang University

Fall 2022, Spring 2023

AE Academic Excellence Scholarship, Department of Automotive Engineering, Hanyang University

Spring 2022, Fall 2023

Diamond-7 Scholarship, Hanyang University

2018 – 2019

Skills

Languages: C, C++, Python, MATLAB/Simulink

Frameworks & Tools: CarMaker, CarSim, ROS1, ROS2

CAD: CATIA