Donggeon (David) Oh

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Keywords

Safety-Critical Learning and Control, Human–Robot Interaction, Decision-Making under Uncertainty

Research Interests

I push the boundaries of **safety assurance** for intelligent systems. In doing so,

- I integrate insights from **control theory**, **reinforcement learning (RL)**, and **dynamic game theory** to certify and enforce safety of high-dimensional, black-box systems under uncertainty.
- I investigate the **interplay between humans and robots** in safety-critical scenarios and how to foster safe, smooth, and **trustworthy collaboration**.

Ultimately, I envision a world where robots operate safely amidst other agents, including humans, in **unstructured, open-world environments**.

Education

Princeton University July 2024–May 2029 (Expected)
Ph.D. student, Department of Electrical and Computer Engineering

- Advisor: Prof. Jaime Fernández Fisac
- Cumulative GPA: 3.84/4.00

Seoul National University Mar. 2017–Aug. 2024
B.S. in Aerospace Engineering & B.S. in Artificial Intelligence

- Advisor: Prof. Hyoun Jin Kim
- Cumulative GPA: 4.11/4.30 (3.92/4.00)—**ranked 2nd** of 71 students.

Publications

Preprints

[P1] Synthesis and Deployment of Maximal Robust Control Barrier Functions through Adversarial Reinforcement Learning
D. D. Oh, D. P. Nguyen, H. Hu, J. F. Fisac
arXiv preprint arXiv:2604.13192, 2026

Conference Proceedings

[C1] Provably Optimal Reinforcement Learning under Safety Filtering
D. D. Oh*, D. P. Nguyen*, H. Hu, J. F. Fisac
*International Association for Safe & Ethical AI (**IASEAI**), 2026*

[C2] Safety with Agency: Human-Centered Safety Filter with Application to AI-Assisted Motorsports
D. D. Oh*, J. Lidard*, H. Hu, H. Sinhmar, E. Lazarski, D. Gopinath, E. S. Sumner, J. A. DeCastro, G. Rosman, N. E. Leonard, J. F. Fisac
*Robotics: Science and Systems (**RSS**), 2025*

[C3] Safety-Critical Control Under Multiple State and Input Constraints and Application to Fixed-Wing UAV
D. D. Oh*, D. Lee*, H. J. Kim
*62nd IEEE Conference on Decision and Control (**CDC**), 2023*

[C4] Stable Contact Guaranteeing Motion/Force Control for an Aerial Manipulator on an Arbitrarily Tilted Surface
J. Byun, B. Kim, C. Kim, **D. D. Oh**, H. J. Kim
*IEEE International Conference on Robotics and Automation (**ICRA**), 2023*

[C5] Real-Time Trajectory Generation of a Quadrotor UAV with Load Suspended from a Pulley
D. D. Oh, J. Byun, D. Lee
*International Conference on Control, Automation and Systems (**ICCAS**), 2022*

Scholarships & Awards

First Year Fellowship in Natural Sciences and Engineering Sept. 2024–May 2025

The Presidential Science Scholarship Mar. 2017–Sept. 2022

- National scholarship recognizing 120 top STEM students; conferred by the President of Korea.

Talent Award of Korea Nov. 2016

- National cross-disciplinary honor recognizing 100 outstanding Koreans across arts, entrepreneurship, STEM, etc.; conferred by the Deputy Prime Minister & Minister of Education of Korea.

Skills & Certification

Learning & Simulation

- PyTorch, MuJoCo, Safety Gymnasium, Assetto Corsa (high-fidelity car racing simulator).

Programming

- Python, MATLAB/Simulink, C/C++, Linux, Git.

Hardware

- FANATEC sim-racing wheelbase and pedals; custom Linux force-feedback torque driver.

Human Subjects Research

- Certified by the CITI Program (IRB — Social & Behavioral Research Investigators, completed Nov. 2024).
- Authored the IRB protocol and study materials and coordinated submission to the Princeton University IRB; ran an in-lab user study (N=83) on human–safety filter interaction in Assetto Corsa.

Teaching

Intelligent Robotic Systems Spring 2026

- Head Teaching Assistant; Instructed by Prof. Jaime F. Fisac at Princeton University.

Academic Services

Reviewer Service

- IEEE Robotics and Automation Letters (RA-L)
- IEEE Conference on Decision and Control (CDC)
- International Association for Safe & Ethical AI (IASEAI)
- International Conference on Neuro-symbolic Systems (NeuS)
- ICRA Workshop on Public Trust in Autonomous Systems (PTAS)

Advising and Mentorship

- Elle Lazarski (undergraduate student at Princeton University)

References

Jaime Fernández Fisac jfisac@princeton.edu

- Assistant Professor of Electrical and Computer Engineering, Princeton University

Haimin Hu haimin@cs.jhu.edu

- Assistant Professor of Computer Science, Johns Hopkins University

Naomi Ehrich Leonard naomi@princeton.edu

- Chair and Edwin S. Wilsey Professor of Mechanical and Aerospace Engineering, Princeton University

Zixu Zhang zhangzix@tesla.com

- Senior Autopilot Machine Learning Scientist, Tesla