

HOTAE LEE

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RESEARCH INTERESTS

Motion Planning, Optimal Control/Model Predictive Control and Machine Learning

EDUCATION

University of California, Berkeley , Berkeley, US	<i>Sep. 2019 - Present</i>
Ph.D. Candidate in Department of Mechanical Engineering	
Seoul National University , Seoul, Republic of Korea	<i>Mar. 2012 - Aug. 2018</i>
B.S. in Department of Mechanical & Aerospace Engineering	
Graduated with second place honor in college of engineering (summa cum laude)	

PUBLICATIONS

(* indicates co-first authors)

H. Lee and F. Borrelli, “Fast Stochastic MPC with Affine Disturbance Feedback Policy using Offline Sampling based Feature extraction”, 2024 (In preparation)

S. H. Nair*, **H. Lee***, E. Joa*, et al. “Predictive control for autonomous driving with uncertain, multi-modal predictions”, IEEE Transactions on Control Systems Technology, 2024

H. Lee, M. Bujarbaruah, and F. Borrelli, “Stochastic mpc with realization-adaptive constraint tightening”, in 2023 American Control Conference (ACC). IEEE, pp. 1838-1843, 2023.

E. Joa*, **H. Lee***, E. Choi, and F. Borrelli, “Energy-Efficient Lane Changes Planning and Control for Connected Autonomous Vehicles on Urban Roads”, in 2023 IEEE Intelligent Vehicles Symposium (IV). IEEE, pp. 908-913, 2023.

H. Lee, M. Bujarbaruah, and F. Borrelli, “Learning How to Solve Bubble Ball”, in Proceedings of Learning for Dynamics and Control (L4DC). PMLR, pp. 1068-1079, 2021.

J. Kim*, M. Kim*, **H. Lee***, K. Kim*, J. Moon*, “A Contextual Inquiry of AVEC: Power Assist Wheelchair Enhancing Communication”, in Proceedings of the 14th ACM/IEEE International Conference on Human Robot Interaction (HRI). IEEE, pp. 642-643, 2019

H. Lee, “Controlling Posture of Jumping Articulated Robot for Stable Landing”, in Proceedings of the 15th IEEE Conference on Ubiquitous Robots (UR). IEEE, pp. 516-522, 2018

RESERACH EXPERIENCE

MPC Laboratory	<i>Sep. 2019 - Present</i>
<i>Ph.D. Candidate</i>	

- Working on efficient Stochastic MPC algorithms for uncertain systems with data-driven methods
- Working on development of trajectory planner and controller on Connected Autonomous Vehicles (CAVs) and integrating ROS2 and CARLA simulations together to conduct HIL(Hardware-In-Loop) framework
- Worked on how to solve multi-contact dynamics based games using optimal control and machine learning
- *Advisor : Professor Francesco Borrelli, UC Berkeley*

Interactive & Networked Robotics Laboratory

Mar. 2017 - July. 2018

Internship

- Developed a control framework for the aerial posture of a jumping robot
- Advisor : Professor Dongjun Lee, Seoul National University

WORK EXPERIENCE

NAVER LABS / Robotics Group

Aug. 2018 - Apr. 2019

Research Internship

- Developed the controller of power-assisted wheelchair with human-interaction
- Integrated the whole system from sensors (IMU and force sensors) to system controllers
- Advisor : Dr. Sangok Seok, Naverlabs

HONORS & AWARDS

Korean Government Scholarship for Study Overseas

Sep. 2019 - Sep. 2021

National Institute for International Education (NIIE), Seong-Nam, Republic of Korea

-\$40,000 per year for excellent students who prepare to study abroad in graduate programs

Student Design Competition 2nd Prize

Mar. 2019

International Conference on Human Robot Interaction (HRI), IEEE Robotics & Automation

The Presidential Science Scholarship

Mar. 2012 - Aug. 2018

Korea Student Aid Foundation (KOSAF), Seoul, Republic of Korea

-Full tuition & additional KRW 2.5million per semester for students of academic excellence

Outstanding B.S. Thesis Presentation Award

Dec. 2017

Seoul National University (SNU), Seoul, Republic of Korea

The Research Support for Undergraduate Students

Aug. 2017 - Dec. 2017

Seoul National University (SNU), Seoul, Republic of Korea

-Support KRW 3 million as research fee for students with research excellence and interest

TEACHING EXPERIENCE

TA (Graduate Student Instructor)

Experiential Advanced Control Design I, UC Berkeley Mechanical Dep.

Aug. 2024 - Present

Tutor

Basic Physics 1 & 2, Seoul National University Physics Dep.

Sep. 2016 - Jun. 2017

Basic Physics 1 & 2, Seoul National University Physics Dep.

Mar. 2013 - Dec. 2013

TECHNICAL STRENGTHS

Programming Languages

C/C++, Python, MATLAB

Software & Tools

ROS1/2, TensorFlow/Pytorch, Casadi, CARLA, OpenAI gym