

Hyunin Lee

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Education

University of California, Berkeley

Ph.D. in Mechanical Engineering

CA, United States

Aug. 2022 –

Seoul National University

B.S in Mechanical Engineering; summa cum laude

Seoul, Rep.of.Korea

Mar. 2015 – Feb. 2022

Research Area

Reinforcement Learning, Multi-Modal Learning, AI Safety

Publications / C: CONFERENCE, J: JOURNAL, P: PREPRINT

[P2] Cross-attention Secretly Performs Orthogonal Alignment in Recommendation models.

H. Lee, Y. Zhang, H. Nguyen, X. Liu, N. Park, C. Jung, Y. Wang, Z. Wang, S. Sojoudi, X. Feng. *preprint*.
[pdf/blog]

[P1] A Prospect Theoretic Rationality: Loss Aversion Can Accelerate Reinforcement Learning

H. Lee, C. Park, S. Sojoudi, N. Mehr. *preprint*. [pdf]

[C5] Position: AI Safety Must Embrace an Antifragile Perspective.

M. Jin, H. Lee. *ICML*. 2025. [pdf]

[C4] A Black Swan Hypothesis: The Role of Human Irrationality in AI Safety.

H. Lee, C. Park, D. Abel, M. Jin. *ICLR*. 2025 & *ICLR 2025 Advances in Financial AI Workshop* (Oral, Top 1.2%). [pdf]

[C3] Pausing Policy Learning in Non-stationary Reinforcement Learning.

H. Lee, M. Jin, J. Lavaei, and S. Sojoudi. *ICML*. 2024. (Oral, Top 1.2%) [pdf/codes/talk]

[J3] Policy-based Primal-Dual Methods for Concave CMDP with Variance Reduction.

D. Ying, M. Guo, H. Lee, Y. Ding, J. Lavaei, and Z. Shen. *JAIR*. 2025. [pdf /codes]

[C2] Tempo Adaptation in Non-stationary Reinforcement Learning.

H. Lee, Y. Ding, J. Lee, M. Jin, J. Lavaei, and S. Sojoudi. *NeurIPS*. 2023 [pdf/codes/slides]

[J2] Beyond Exact Gradients: Convergence of Stochastic Soft-Max Policy Gradient Methods with Entropy Regularization.

Y. Ding, J. Zhang, H. Lee, and J. Lavaei. *IEEE TAC*. 2025 [pdf]

[C1] Initial State Interventions for Deconfounded Imitation Learning.

S. Pfrommer, Y. Bai, H. Lee, and S. Sojoudi. *IEEE CDC*. 2023. [pdf]

[J1] Explainable Deep Learning Model for EMG Based Finger Angle Estimation Using Attention.

H. Lee, D. Kim, and Y. Park. *IEEE TNSRE*. vol. 30, pp. 1877-1886 2022. [pdf/codes]

Work Experience

Meta

Research Scientist Intern

May 2025 – Oct 2025

Ranking AI Research Team

- Researched on transformer-based **multi-modal recommendation model**, enhancing ranking performance in sparse data setting. (Intern manager: Yong Zhang)
- Proposed a novel cross-attention mechanism—orthogonal alignment—achieving 1.5x improvement in **scaling law efficiency**, validated on both Meta ranking model and public baselines. [p1]

OpenAI

Research Associate

Mar 2025 – Aug 2025

Human Data (Research) Team

- Engaged with the safety and preparedness team to evaluate an AI agent’s ability to replicate ML research and to create a comprehensive rubric that defines objective success criteria for accurately reproducing given ML papers. (Hired by Benjamin Kinsella)

University of California, Berkeley

Graduate Student Researcher

Aug 2022 – Present

Advisor: Prof. Somayeh Sojoudi

- Investigating **non-stationary reinforcement learning** and optimization under distributional shift. [p1, p2]
- Investigating **Human-AI alignment** focusing on ensuring **safe AI systems** in the presence of unpredictable or non-standard human behaviour. [p1, p2, p3]

OUTTA [Homepage] [LinkedIn]

Co-Founder

Aug 2021 – Present

Seoul, South Korea

- Deliver online AI courses to **800+ students** annually across South Korea.

Knowledge AI

Machine Learning Engineer

Jul 2021 – Jul 2022

Boston, MA

- Implemented a **Bayesian inference algorithm** in Python to quantify students’ mastery of mathematics topics.
- Developed a question-recommendation deep-learning system for an online math-learning platform, boosting student performance.

Seoul National University

Undergraduate Research Intern

Mar 2021 – Nov 2021

Soft Robotics & Bionics Lab

- Designed an **attention-based sequential decision-making algorithm** in Python to predict finger-joint angles from forearm EMG signals, improving accuracy by more than 10%.

Seoul National University

Undergraduate Research Intern

Sep. 2020 – Jun. 2021

Robot Learning Lab

- Develop **deep generative Q learning algorithm** to reconstruct a reward kernel using Python [pdf] [video]

Academic Activity

Reviewer	ICLR 2024-2025, ICML 2024-2025, NeurIPS 2024-2025, RLC 2025, AISTATS 2025
Program Chair Committee	AAAI 2025

Teaching Experience

Graduate Student Instructor, Statistics and Data Science for Engineers	Fall, Spring 2025
Graduate Student Instructor, Dynamic Systems and Feedback	Fall 2024
Teaching Tutor, Math and Physics for Freshman	Spring 2019, Spring 2020
Teaching Assistant, Dynamic	Fall 2019
Teaching Assistant, Mechanical Product Design	Fall 2020

Grants and Honors

Berkeley Summer Research Fellowship Mechanical Engineering Department	Summer 2024
NeurIPS scholar award Conference on Neural Information Processing Systems	Dec. 2023
Kwanjeong Abroad Scholarship Kwanjeong Educational Foundation	Fall 2022 – Present
Berkeley Fellowship for Graduate Study Graduate Division	Fall 2022 – Spring 2023

National Science & Technology Scholarship <i>Korea Student Aid Foundation</i>	Spring 2017, Fall 2019
	Spring 2020, Fall 2020
Certificate of Appreciation (OUTTA) <i>Dean, college of Engineering, Seoul National University</i>	Jun. 2021
Scholarship to Academic Excellence <i>Seoul National University</i>	Spring 2015, Fall 2015
	Spring 2016, Fall 2016

Graduate courses

Specialization: Non-convex Optimization & Reinforcement Learning

Theoretical statistics I, II, Probability Theory I, II
Convex Optimization (convex optimization, robust optimization)
Mathematical Programming II (Advanced optimization theory, non-convex optimization)
Advanced control system I (canonical state-space representation forms, Lyapunov stability, LQR control)
Experiential advanced control design I, II (model predictive control, kalman filter)
Linear System, Nonlinear System

Technical Skills

Languages: Python (Advanced), MatLab (Advanced), C++
Software library, platform : Pytorch (Advanced), Tensorflow. Gurobi (Advanced), CPLEX (Advanced)