Hojoon Lee

joonleesky@naver.com | *https://joonleesky.github.io*

Research Interest

I'm interested in building physical AI for dexterous manipulation.
My current research focuses on real2sim2real pipelines for learning robot skills from real-world data, with reinforcement learning as a core training paradigm.

Selected Publications

- Robot Learning *FlashDexRetarget (arXiv'26)*, *PointMapVLA (arXiv'26)*, *DiscoDemo (arXiv'26)*, *PHUMA (CoRL'26 Spot)*, *VisionGT (RA-L'26)*.
- Scalablet RL: *FlashSAC (RSS'26 🏆)*, *FIRE (ICLR'26 Oral)*, *SimbaV2 (ICML'25 Spot)*, *Simba (ICLR'25 Spot)*.
- Decision Making: *RecRL (SIGIR'22 🏆)*.

Education

2022.03 – 2026.02 **KAIST, PhD** in Artificial Intelligence (Advisor: *Jaegul Choo*).
Thesis: *Maintaining Plasticity for Scalable Deep Reinforcement Learning*.
Committee: *Jaegul Choo*, *Chulhee Yun*, *Kimin Lee*, *Clare Lyle*, *Peter Stone*.

2020.03 – 2022.02 **KAIST, MS** in Artificial Intelligence.
Thesis: *Personalized Draft Recommendation System for Victory in League of Legends*.

2014.03 – 2020.02 **Korea University, BS** in Computer Science.

Work Experience

2026.01 – Current **Senior Research Scientist @ Holiday Robotics**
Developing a real2sim2real pipeline for dexterous manipulation.

2025.05 – 2025.11 **Research Intern @ Meta Reality Labs** (Mentor: *Nitin Kamra*, *Karl Ridgeway*)
Designed an autonomous reward design agent for dexterous manipulation.
paper

2025.02 – 2025.04 **Research Intern @ Krafton AI** (Mentor: *Dongmin Park*, *Jongho Park*)
Developed an LLM-based chess-playing agent by RLVR.
paper

2024.02 – 2024.08 **Research Intern @ Sony AI** (Mentor: *Takuma Seno*, *Kaushik Subramanian*, *Peter Stone*)
Developed a vision-based autonomous racing agent in Gran Turismo 7.
paper, *video*

2021.09 – 2021.11 **Research Intern @ Kakao Enterprise** (Mentor: *Kyushik Min*)
Implemented an open-source reinforcement learning library for research.
code (300+☆)

2019.03 – 2019.07 **Research Intern @ Neowiz** (Mentor: *Jaejin Yoon*)
Developed a reinforcement learning agent for the tactical RPG game, Browndust.
poster

Publications

Robot Learning

arXiv'26 — PointMapVLA: Aligning 3D Perception with Action for VLA Models
Dongyoon Hwang, Dongjin Kim*, Byungkun Lee*, Kyungmin Lee, Dohyun Lee,* ***Hojoon Lee****, Minho Park, Jaegul Choo.*
Coming Soon

arXiv'26 — DiscoDemo: Discovering Diverse yet Optimal Demonstrations for Imitation Learning
Minho Park, Kinam Kim*, Donghu Kim, Byungkun Lee, Dongyoon Hwang, Yongjae Shin, Junha Hyung,* ***Hojoon Lee***†*, Jaegul Choo*†*.*
paper, website

arXiv'26 — FlashDexRetarget: Accelerating Dexterous Manipulation Data Generation through multi-motion retargeting
Kyungmin Lee, Sibeen Kim*, Dongyoon Hwang*, Yunsang Oh*, Donghu Kim, Youngdo Lee, I Made Aswin Nahrendra, Jaegul Choo*†*,* ***Hojoon Lee***†*.*
paper, website

arXiv'26 — See Like a Robot: Robot-Centric PointMaps for VLA
Byungkun Lee, Dongyoon Hwang*, Minho Park, Dongjin Kim,* ***Hojoon Lee****, Jaegul Choo.*
paper, website

CoRL'26 (spotlight) — PHUMA: Physically Grounded Humanoid Locomotion Dataset
Kyungmin Lee, Sibeen Kim*, Minho Park, Dongyoon Hwang,* ***Hojoon Lee***†*, Jaegul Choo*†*.*
paper, website, code (200+☆)

RLC'26 — RDA: Reward Design Agent for Reinforcement Learning
Hojoon Lee*, Ajay Subramanian, Ben Abbatematteo, Pedro Matias, Vijay Veerabadran, Karl Ridgeway, Nitin Kamra.*
paper, website

IROS'26 — 3D HAMSTER: Hierarchical VLAs through 3D Trajectory Guidance
Dongyoon Hwang, ByungKun Lee*, Dongjin Kim, Hyojin Jang, Hoiyeong Jin, Jueun Mun, Minho Park,* ***Hojoon Lee****, Hyunseung Kim, Jaegul Choo.*
paper, website, code

ICRA'26 — ACG: Action Coherence Guidance For Flow-based VLA Models.
Minho Park, Kinam Kim*, Junha Hyung, Hyojin Jang, Hoiyeong Jin, Jooyeol Yun,* ***Hojoon Lee***†*, Jaegul Choo*†*.*
paper, website, code

RA-L'25 — A Champion-level Vision-based Racing Agent for Competitive Racing in GT7.
Hojoon Lee*, Takuma Seno*, Jun Jet Tai*, Kaushik Subramanian, Kenta Kawamoto, Peter Stone, Peter R.Wurman.*
paper, video

Scalablet RL

RSS'26 *(outstanding 🏆)*
FlashSAC: Fast and Stable Off-Policy RL for High-Dimensional Robot Control
Donghu Kim, Youngdo Lee*, Minho Park, Kinam Kim, Takuma Seno, Aswin Nahendra, Sehee Min, Daniel Palnicek, Florian Vogt, Danica Kraig, Jan Peters, Jaegul Choo†, **Hojoon Lee**†.*
paper, website, code (500+☆)

RLC'26
Unleashing the Architectural Potential of RL in Visual Continuous Control
*Donghu Kim, Youngdo Lee, **Hojoon Lee**, Johan Obando-Ceron, ByungKun Lee, Aaron Courville, Pablo Samuel Castro, Jaegul Choo, Clare Lyle.*
paper

ICLR'26 *(oral)*
FIRE: Frobenius-Isometry Reinitialization for Balancing Stability-Plasticity Tradeoff
*Isaac Han, Sangyeon Park, Seungwon Oh, Donghu Kim, **Hojoon Lee**†, Kyungjoon Kim†.*
paper, website

ICML'25 *(spotlight)*
SimbaV2: Hyperspherical Normalization for Scalable RL
Hojoon Lee, Youngdo Lee*, Takuma Seno, Donghu Kim, Peter Stone, Jaegul Choo.*
paper, website, code (100+☆)

ICLR'25 *(spotlight)*
Simba: Simplicity Bias for Scaling Up Parameters in Deep RL
Hojoon Lee, Dongyoon Hwang*, Donghu Kim, Hyunseung Kim, Jun Jet Tai, Kaushik Subramanian, Peter R.Wurman, Jaegul Choo, Peter Stone, Takuma Seno.*
paper, website, code (100+☆)

ICML'24
Slow and Steady Wins the Race: Maintaining Plasticity with Hare and Tortoise
***Hojoon Lee**, Hyeonseo Cho, Hyunseung Kim, Donghu Kim, Jaegul Choo, Clare Lyle.*
paper

NeurIPS'23
PLASTIC: Improving Input and Label Plasticity for Sample-Efficient RL
Hojoon Lee, Hanseul Cho*, Hyunseung Kim*, Daehoon Gwak, Joonkee Kim, Jaegul Choo, Seyoung Yun, Chulhee Yun.*
paper

Representation and Skill Learning

NeurIPS'24
Do's and Don'ts: Learning Desirable Skills with Instruction Videos
*Hyunseung Kim, Byungkun Lee, **Hojoon Lee**, Dongyoon Hwang, Donghu Kim, Jaegul Choo.*
paper

ICML'24
Investigating Pre-training Objectives for Generalization in Vision-Based RL
Donghu Kim, **Hojoon Lee***, Kyungmin Lee*, Dongyoon Hwang, Jaegul Choo.*
paper

NeurIPS'23
Learning to Discover Skills through Guidance
Hyunseung Kim, Byungkun Lee*, **Hojoon Lee**, Dongyoon Hwang, Kyuhsik Min, Jaegul Choo.*
paper

ICML'23
On the importance of Feature Decorrelation for Representation Learning in RL
***Hojoon Lee**, Gwanho Lee, Dongyoon Hwang, Hyunho Lee, Byungkun Lee, Jaegul Choo.*
paper

Decision Making

CoLMw'25 Can Large Language Models Develop Strategic Reasoning? Post-training insights from Learning to Play Chess
Dongyoon Hwang, **Hojoon Lee***, Jaegul Choo, Dongmin Park, Jongho Park.*
paper

EMNLPw'25 Comparative Trap: Pairwise Comparisons Amplify Bias of LLM Evaluators
*Hawon Jeong, Chaehun Park, Jimin Hong, **Hojoon Lee**, Jaegul Choo.*
paper

CIKM'23 A Spatio-Temporal Framework for Real-Estate Appraisal
Hojoon Lee, Byungkun Lee*, Hawon Jeong*, Jaegul Choo.*
paper

SIGIR'22 (honorable 🏆) Towards Validating Long-Term User Feedback in Interactive RecSys
***Hojoon Lee**, Dongyoon Hwang, Kyushik Min, Jaegul Choo.*
paper

WWW'22 DraftRec: Personalized Draft Recommendation System for Victory in MOBA games
Hojoon Lee, Dongyoon Hwang*, Hyunseung Kim, Byungkun Lee, Jaegul Choo*
paper

Mentoring

2026.05 – 2026.08 Yoonsang Oh (SNU BS → KAIST MS/PhD)
2025.07 – 2026.08 Isaac Han (GIST PhD)
2025.03 – 2026.08 Kyungmin Lee (KAIST MS/PhD)
2025.03 – 2026.08 Sibeen Kim (KAIST MS/PhD)
2025.03 – 2025.10 Minho Park (KAIST PhD)
2024.10 – 2026.02 Donghu Kim (KAIST MS → Holiday Robotics)
2024.10 – 2026.02 Youngdo Lee (KAIST MS → Holiday Robotics)
2023.09 – 2024.02 Hyeonseo Cho (Konkuk BS → KAIST MS/PhD)
2021.09 – 2023.02 Dongyoon Hwang (Korea Univ BS → KAIST PhD)
2021.09 – 2023.02 Hyunseung Kim (Korea Univ BS → KAIST PhD → Krafton AI)

Honors and Awards

2026.07 RSS Outstanding Paper Award
2022.10 ACM SIGIR: Best Short Paper Honorable Mention Award
2021.03 **Korea Government:** Full Academic Scholarship (10,000 USD)
2019.12 **Korea University:** Graduation Project Award (1,500 USD)
2017.09 **Seongnam City:** College Scholarship (4,000 USD)
2017.02 **US Army:** General Paik Sun Yup Leadership Award *article*

Academic Services

Reviewer NeurIPS'24-26, ICML'24-27, ICLR'24-27, AAAI'25, CoLLAs'25-26, CoG'25, RLC'26, WACV'26, ICRA'26-27, IROS'26, RSS'27

Military Services

2015.04-2017.03 KATUSA (Korean Augmentation to the U.S. Army), Discharged as Sergeant