

# Hoon Lee

[joonleesky@naver.com](mailto:joonleesky@naver.com) | <https://joonleesky.github.io>

## Research Interest

My goal is to develop a scalable robotic foundation model that can continually adapt and generalize.

I enjoy collaborating with diverse teams, mentoring juniors, and building real-world systems.

Previous works include:

- Scalable RL & Plasticity ([Preprint'25](#), [Preprint'25](#), [ICML'25](#), [ICLR'25](#), [ICML'24](#), [NeurIPS'23](#)).
- Robotics ([Preprint'25](#), [Preprint'25](#), [Preprint'25](#), [RA-L'25](#)).
- RL Post-training ([COLMw'25](#), [WWW'22](#)).
- Self-supervised learning ([ICML'24](#), [ICML'23](#)).
- Skill Discovery ([NeurIPS'24](#), [NeurIPS'23](#)).

## 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](#).  
[slide](#)

2020.03 – 2022.02 KAIST, MS in Artificial Intelligence.

Thesis: *Personalized Draft Recommendation System for Victory in League of Legends*.  
[thesis](#)

2014.03 – 2020.02 Korea University, BS in Computer Science.

## Work Experience

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 a chess-playing agent by fine-tuning an LLM with reinforcement learning.  
[paper](#)

2024.02 – 2024.08 Research Intern @ Sony AI (Mentor: [Takuma Seno](#), [Kaushik Subramanian](#), [Peter Stone](#))

Developed a vision-based autonomous racing agent in GranTurismo 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](#)

## Research Topics and Publications

### Maintaining Plasticity for Scalable RL

- Preprint'25*      **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](#)
- Preprint'25*      **FIRE: Frobenius-Isometry Reinitialization for Balancing Stability-Plasticity Tradeoff**  
*Isaac Han, Sangyeon Park, Seungwon Oh, Donghu Kim, **Hojoon Lee**, Kyungjoon Kim.*  
[paper](#)
- ICML'25*  
*(spotlight)*      **SimbaV2: Hyperspherical Normalization for Scalable RL**  
***Hojoon Lee**<sup>\*</sup>, Youngdo Lee<sup>\*</sup>, Takuma Seno, Donghu Kim, Peter Stone, Jaegul Choo.*  
[paper](#), [website](#), [code](#) (50+☆)
- ICLR'25*  
*(spotlight)*      **Simba: Simplicity Bias for Scaling Up Parameters in Deep RL**  
***Hojoon Lee**<sup>\*</sup>, Dongyoon Hwang<sup>\*</sup>, 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**<sup>\*</sup>, Hanseul Cho<sup>\*</sup>, Hyunseung Kim<sup>\*</sup>, Daehoon Gwak, Joonkee Kim, Jaegul Choo, Seyoung Yun, Chulhee Yun.*  
[paper](#)
- Robotics**
- Preprint'25*      **RDA: Reward Design Agent for Reinforcement Learning**  
***Hojoon Lee**, Ajay Subramanian, Ben Abbatematteo, Pedro Matias, Vijay Veerabadran, Karl Ridgeway, Nitin Kamra.*  
[paper](#)
- Preprint'25*      **PHUMA: Physically Grounded Humanoid Locomotion Dataset**  
*Kyungmin Lee<sup>\*</sup>, Sibeon Kim<sup>\*</sup>, Minho Park, Dongyoon Hwang, **Hojoon Lee**, Jaegul Choo.*  
[paper](#), [website](#), [code](#) (150+☆)
- Preprint'25*      **ACG: Action Coherence Guidance For Flow-based VLA Models.**  
*Minho Park<sup>\*</sup>, Kinam Kim<sup>\*</sup>, 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](#)

## RL Post-training

- 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](#)
- WWW'22      DraftRec: Personalized Draft Recommendation System for Victory in MOBA games  
***Hojoon Lee\***, Dongyoon Hwang\*, Hyunseung Kim, Byungkun Lee, Jaegul Choo*  
[paper](#)

## Self-Supervised Learning

- ICML'24      Investigating Pre-training Objectives for Generalization in Vision-Based RL  
*Donghu Kim\*, **Hojoon Lee\***, Kyungmin Lee\*, Dongyoon Hwang, 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](#)

## Skill Discovery

- 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](#)
- NeurIPS'23      Learning to Discover Skills through Guidance  
*Hyunseung Kim\*, Byungkun Lee\*, **Hojoon Lee**, Dongyoon Hwang, Kyuhsik Min, Jaegul Choo.*  
[paper](#)

## Mentoring

- 2025.03 – 2025.10 **Isaac Han**: Advised on [Preprint'25](#) (GIST PhD)
- 2025.03 – 2025.10 **Kyungmin Lee**: Advised on [Preprint'25](#) (KAIST PhD)
- 2025.03 – 2025.10 **Sibeen Kim**: Advised on [Preprint'25](#) (KAIST MS)
- 2025.03 – 2025.10 **Minho Park**: Mentored on [Preprint'25](#) (KAIST PhD)
- 2024.10 – 2025.03 **Donghu Kim**: Mentored on [Preprint'25](#), [ICML'24](#) (KAIST MS)
- 2024.10 – 2025.03 **Youngdo Lee**: Mentored on [ICML'24](#) (KAIST MS → Krafton AI)
- 2023.09 – 2024.02 **Hyeonseo Cho**: Mentored on [ICML'24](#) (Konkuk BS → KAIST MS)
- 2021.09 – 2023.02 **Dongyoon Hwang**: Co-authored 5 papers (Korea Univ BS → KAIST PhD)
- 2021.09 – 2023.02 **Hyunseung Kim**: Co-authored 4 papers (Korea Univ BS → KAIST PhD → Krafton AI)

## Skills

- Technical      C, Python, PyTorch, Jax, Tensorflow, Git, CI/CD, Docker, Isaac, Mujoco
- Lingual      Korean (native), English (business fluent)

## Talks and Presentations

- 2024.11 BeNeRL: Designing Neural Network Architecture for Deep RL [slide](#)
- 2024.05 Sony AI: Towards Plastic Neural Network [slide](#)
- 2024.02 Konkuk University: Towards Plastic Neural Network [slide](#)
- 2023.12 RL Korea: Pretraining for Intelligent Reinforcement Learning Agent [slide](#)

## Honors and Awards

- 2023.06 Crevisse Partners: CIKM Travel Award (3,000 USD)
- 2022.10 ACM SIGIR: Best Short Paper Honorable Mention Award
- 2021.03 Korea Government: Full Academic Scholarship (10,000 USD)
- 2020.03 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, ICML, ICLR, AAAI, CoLLAs, ICRA, IROS, CoG

## Military Services

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