

Hojoon Lee

AI RESEARCHER

✉ joonleesky@kaist.ac.kr | 🏠 blog | 🐙 github

Research Interests

My research aims to create intelligent systems that can continually learn, adapt, and generalize in dynamic environments. To do so, I am interested in self-supervised learning, reinforcement learning, and its applications to gaming and robotics.

Education

KAIST

PH.D. STUDENT IN ARTIFICIAL INTELLIGENCE, ADVISED BY PROF. JAE GUL CHOO

Seongnam, Korea

Mar.2022 - Present

KAIST

M.S IN ARTIFICIAL INTELLIGENCE, ADVISED BY PROF. JAE GUL CHOO (GPA: 4.1/4.3)

Seongnam, Korea

Mar.2020 - Feb.2022

Korea University

B.S IN COMPUTER SCIENCE (GPA: 4.05/4.5)

Seoul, Korea

Mar.2014 - Feb.2020

Work

Sony AI

RESEARCH INTERN

Tokyo, Japan

Feb.2024 - Aug.2024

- Developing a vision-based autonomous racing agent in a realistic simulator using reinforcement learning.
- Mentor: [Takuma Seno](#) and [Kaushik Subramanian](#).

KakakEnterprise

AI RESEARCH INTERN

Seongnam, Korea

Sep.2021 - Feb.2022

- Built an open-source reinforcement learning framework, [Jorlady](#) (300+ ☆).

Neowiz

AI RESEARCH INTERN

Seongnam, Korea

Mar.2019 - Jul.2019

- Develop a reinforcement learning agent that can play a turn-based strategy game, [BrowndustZero](#).

Selected Publications

Slow and Steady Wins the Race: Maintaining Plasticity with Hare and Tortoise Networks

ICML'24

- Hojoon Lee**, Hyeonseo Cho, Hyunseung Kim, Donghu Kim, Dugki Min, Jaegul Choo, Clare Lyle
- To maintain network plasticity, introduce Hare and Tortoise networks, imitating the hippocampus and neocortex of the brain.

Investigating Pre-Training Objectives for Generalization in Vision-Based RL

ICML'24

- Donghu Kim*, **Hojoon Lee***, Kyungmin Lee*, Dongyoon Hwang, Jaegul Choo
- Investigate which pre-training objectives are beneficial for out-of-distribution generalization in visual RL.

PLASTIC: Enhancing Input and Label Plasticity for Sample Efficient Reinforcement Learning

NeurIPS'23

- Hojoon Lee***, Hanseul Cho*, Hyunseung Kim*, Daehoon Gwak, Joonkee Kim, Jaegul Choo, Se-Young Yun, Chulhee Yun
- Construct a sample-efficient RL algorithm by preserving the model's input & label plasticity throughout training.

Honors & Awards

Travel Award (\$3,000 as awards), Crevisse Partners, 2023.

SIGIR Best Short Paper Honorable Mention, 2022.

Korea Government Full Scholarship (\$10,000 per year), Ministry of Science and ICT of Korea, 2020, 2021.

2nd place (\$2,000 as awards), Korea University Graduation Project Competition, 1st & 2nd Semester, 2019.

College Scholarship (\$4,000 credit as awards), Seongnam Scholarship Foundation, 2017.

Dean's List, Korea University, 2017.

Eight Army General Paik Sun Yup Leadership Award, LTG Thomas.S.Vandal, U.S Army, 2017.

Technical-Skills

Proficient Git, Python, PyTorch, Tensorflow, Jax
Experience C, Docker, SQL, Hadoop

Languages

English Fluent
Korean Native

Academic Service

Reviewer Neurips'23, ICLR'23, ICML'24

Publications

Do's and Don'ts: Learning Desirable Skills with Instruction Videos

Preprint

- Hyunseung Kim, Byungkun Lee, **Hojoon Lee**, Dongyoon Hwang, Donghu Kim, Jaegul Choo
- We present DoDont, a skill discovery algorithm that learns diverse behaviors while following the instruction videos.

Slow and Steady Wins the Race: Maintaining Plasticity with Hare and Tortoise Networks

ICML'24

- Hojoon Lee**, Hyeonseo Cho, Hyunseung Kim, Donghu Kim, Dugki Min, Jaegul Choo, Clare Lyle
- To maintain network plasticity, introduce Hare and Tortoise networks, imitating the hippocampus and neocortex of the brain.

Investigating Pre-Training Objectives for Generalization in Vision-Based RL

ICML'24

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Adapting Pretrained ViTs with Convolution Injector for Visuo-Motor Control

ICML'24

- Donyoon Hwang*, Byungkun Lee*, **Hojoon Lee**, Hyunseung Kim, Jaegul Choo
- Introduce an add-on convolution module for ViT which injects locality and translation equivariant biases.

PLASTIC: Enhancing Input and Label Plasticity for Sample Efficient Reinforcement Learning

NeurIPS'23

- Hojoon Lee***, Hanseul Cho*, Hyunseung Kim*, Daehoon Gwak, Joonkee Kim, Jaegul Choo, Se-Young Yun, Chulhee Yun
- Construct a sample-efficient RL algorithm by preserving the model's input & label plasticity throughout training.

Learning to Discover Skills through Guidance

NeurIPS'23

- Hyunseung Kim*, Byungkun Lee*, **Hojoon Lee**, Dongyoon Hwang, Kyushik Min, Sejik Park, Jaegul Cho
- Develop a skill-discovery algorithm based on the spirit of the Go-Explore algorithm.

On the Importance of Feature Decorrelation for Unsupervised Representation Learning in RL

ICML'23

- Hojoon Lee**, Gwanho Lee, Dongyoon Hwang, Hyunho Lee, Byungkyeun Lee, and Jaegul Choo
- Develop a self-predictive representation learning method from video for reinforcement learning.

ST-RAP: A Spatio-Temporal Framework for Real Estate Appraisal

(short) CIKM'23

- Hojoon Lee***, Hawon Jeong*, Byungkun Lee*, and Jaegul Choo
- Propose a novel real estate appraisal framework that integrates a real estate's spatial and temporal aspects.

Towards Validating Long-Term User Feedbacks in Interactive Recommender System

 *(short) SIGIR'22*

- Hojoon Lee**, Dongyoon Hwang, Kyusik Min, and Jaegul Choo
- Analyze the existence of long-term effects in reinforcement learning-based interactive recommender systems.

DraftRec: Personalized Draft Recommendation for Winning in MOBA Games

WWW'22

- Hojoon Lee***, Dongyoon Hwang*, Hyunseung Kim, Byungkun Lee, and Jaegul Choo
- Develop a personalized champion recommendation system in *League of Legends* with a hierarchical transformer architecture.

Enemy Spotted: In-game Gun Sound Dataset for Gunshot Classification and Localization

COG'22

- Junwoo Park, Youngwoo Cho, Gyuhyeon Sim, **Hojoon Lee**, and Jaegul Choo
- Enhance the accuracy of real-world firearm classification and localization by in-game gun sound dataset.