

# Hojoon Lee

AI RESEARCHER

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## Research Interests

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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

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### KAIST

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

Seongnam, Korea

Mar.2022 - Present

### KAIST

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

Seongnam, Korea

Mar.2020 - Feb.2022

- Thesis: Personalized Draft Recommendation for Winning in MOBA Games.

### Korea University

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

Seoul, Korea

Mar.2014 - Feb.2020

## Work

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### Sony AI

RESEARCH INTERN

- On-going.

Tokyo, Japan

Feb.2024 - Aug.2024

### KakakEnterprise

AI RESEARCH INTERN

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

Seongnam, Korea

Sep.2021 - Feb.2022

### Neowiz

AI RESEARCH INTERN

- Develop an AI that can play a turn-based strategy game, *BrowndustZero*.

Seongnam, Korea

Mar.2019 - Jul.2019

## Selected Publications

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

Preprint

- **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.

### 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.

### 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.

## Honors & Awards

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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

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<b>Proficient</b>	Python, PyTorch, Git
<b>Competent</b>	C, TensorFlow
<b>Novice</b>	Jax, JavaScript, SQL, Hadoop, GCP

## Languages

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<b>English</b>	Fluent
<b>Korean</b>	Native

## Academic Service

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<b>Reviewer</b>	Neurips'23, ICLR'23
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## Publications

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

- **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 Visual Reinforcement Learning *Preprint*

- 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.

### A Simple Convolution Injector for ViT: Towards Effective Adaptation in Visuo-Motor Control *Preprint*

- 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.