# Hojoon Lee

AI Researcher

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## 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** — *Seongnam, Korea*
Ph.D. student in Artificial intelligence, advised by Prof.Jaegul Choo — *Mar.2022 - Present*

**KAIST** — *Seongnam, Korea*
M.S in Artificial intelligence, advised by Prof.Jaegul Choo (GPA: 4.1/4.3) — *Mar.2020 - Feb.2022*

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

**Korea University** — *Seoul, Korea*
B.S in Computer Science (GPA: 4.05/4.5) — *Mar.2014 - Feb.2020*

## Work

**Sony AI** — *Tokyo, Japan*
Research Intern — *Feb.2024 - Aug.2024*

- On-going.

**KakakEnterprise** — *Seongnam, Korea*
AI Research Intern — *Sep.2021 - Feb.2022*

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

**Neowiz** — *Seongnam, Korea*
AI Research Intern — *Mar.2019 - Jul.2019*

- Develop an AI 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.

**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

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** Python, PyTorch, Git
**Competent** C, TensorFlow
**Novice** Jax, JavaScript, SQL, Hadoop, GCP

## Languages

**English** Fluent
**Korean** Native

## Academic Service

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

## 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 Visual Reinforcement Learning** *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.

**A Simple Convolution Injector for ViT: Towards Effective Adaptation in 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.