Donghu Kim

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Research Interest

Efficient Reinforcement Learning

- Making RL work with as little samples and/or compute as possible.
- Related: Simba, SimbaV2, AtariPB

Plasticity

- Maintaining plasticity (the ability to train) when the data distribution is constantly shifting/expanding.
- Related: Dynamic MoE, Catastrophic Interference, Hare&Tortoise

Education

KAIST *Seongnam, Korea*

M.S. Student in AI (GPA: 3.8/4.3) *Mar. 2024 - Present*

- Advised by Jaegul Choo

Korea University *Seoul, Korea*

B.S. in Computer Science (Major GPA: 4.5/4.5, Cumulative GPA: 4.2/4.5) *Mar. 2018 - Feb. 2024*

Publications & Preprints

SimbaV2: Hyperspherical Normalization for Scalable Deep Reinforcement Learning *Preprint*

Hojoon Lee*, Youngdo Lee*, Takuma Seno, **Donghu Kim**, Peter Stone, Jaegul Choo

- arXiv / project page / code

SimBa: Simplicity Bias for Scaling Up Parameters in Deep Reinforcement Learning *ICLR'25*

Hojoon Lee*, Dongyoon Hwang*, **Donghu Kim**, ... , Jaegul Choo, Peter Stone, Takuma Seno ***Spotlight***

- arXiv / project page / code

Do's and Don'ts: Learning Desirable Skills with Instruction Videos *NeurIPS'24*

Hyunseung Kim, Byungkun Lee, Hojoon Lee, Dongyoon Hwang, **Donghu Kim**, Jaegul Choo *Poster*

- arXiv / project page

ATARI-PB: Investigating Pre-Training Objectives for Generalization in Pixel-Based RL *ICML'24*

Donghu Kim*, Hojoon Lee*, Kyungmin Lee*, Dongyoon Hwang, Jaegul Choo *Poster*

- arXiv / project page / code

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 *Poster*

- arXiv / code

Projects & Experiences

Dynamic Mixture-of-Experts *2025*

Explored dynamically increasing the number of experts in MoE layers to maintain plasticity under severe distribution shifts (e.g., Craftax).

- report / slides

KAN RL *2024*

Implemented Kolmogorov-Arnold Network in sequential Atari environments and investigated its relevance to catastrophic forgetting and plasticity.

- report (Colab)

RL Basic Tutorial *2024*

Developed and delivered a series of three lectures on reinforcement learning for a government-funded bootcamp program in Korea.

- page / material1 (Korean) / material2 (Korean)

Character-level BERT *2022*

Proposed a character-level tokenizer for BERT to enhance robustness against character-level attacks such as spam email manipulation.

- report / code

Honors & Awards

Korea University	Academic Excellence Award	*2019, 2022*
NCsoft AI Fellowship	Starcraft AI Competition Silver Prize ($2000)	*2019*
Korea Student Aid Foundation	Presidential Science Scholarship (Total $40000)	*2018*