

# Changyeon Kim

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## Research Interest

My research interest lies on applying RL algorithms to challenging tasks where reward specification is burdensome. To this end, I am focusing on designing RL algorithms to tackle practical and challenging scenarios like unseen novel environments and environments without well-shaped rewards. Especially, I am interested in human preference based reinforcement learning. I am also broadly interested in areas related to RL, including RL leveraging pre-trained representation learning, language-conditioned RL, and offline RL.

## Education

### Korea Advanced Institute of Science and Technology

PHD IN ARTIFICIAL INTELLIGENCE

Advisor: Jinwoo Shin and Kimin Lee

*Daejeon, S.Korea*

*Mar. 2022 - Present*

### Korea Advanced Institute of Science and Technology

B.SC. IN COMPUTER SCIENCE AND MATHEMATICS (MINOR)

*Daejeon, S.Korea*

*Mar. 2016 - Feb. 2021*

## Publications

C: Conference, W: Workshop, P: Preprint, \*: Equal contribution

### [C3] Guide Your Agent with Adaptive Multimodal Rewards

CHANGYEON KIM, YOUNGGYO SEO, HAO LIU, LISA LEE, JINWOO SHIN, HONGLAK LEE, KIMIN LEE

- Neural Information Processing Systems (NeurIPS), 2023.
- A preliminary version appeared at ICML Workshop on New Frontiers in Learning, Control, and Dynamical Systems (ICMLW), 2023.

*New Orleans, USA*

*Dec, 2023.*

### [C2] Preference Transformer: Modeling Human Preferences using Transformers for RL

CHANGYEON KIM\*, JONGJIN PARK\*, JINWOO SHIN, HONGLAK LEE, PIETER ABBEEL, KIMIN LEE

- International Conference on Learning Representations (ICLR), 2023.

*Kigali, Rwanda*

*May, 2023.*

### [W1] Dynamics-Augmented Decision Transformer for Offline Dynamics Generalization

CHANGYEON KIM\*, JUNSU KIM\*, YOUNGGYO SEO, KIMIN LEE, HONGLAK LEE, JINWOO SHIN

- Neural Information Processing Systems Workshop on Offline Reinforcement Learning (NeurIPS-W), 2022.

*New Orleans, LA, USA*

*Nov, 2022.*

### [C1] Collecting the Public Perception of AI and Robot Rights

GABRIEL LIMA, CHANGYEON KIM, SEUNGHO RYU, CHIHOUNG JEON, MEEYOUNG CHA

- Conference on Computer-Supported Cooperative Work and Social Computing (CSCW), 2020.

*Online*

*Oct, 2020.*

### [P1] MOI-Mixer: Improving MLP-Mixer with Multi Order Interactions in Sequential Recommendation

HOJUN LEE, DONGYOON HWANG, SUNGHWAN HONG, CHANGYEON KIM, SEUNGRYONG KIM, JAEGUL CHOO

- ArXiv Preprint.

## Work Experience

### External Collaborator

LISA LEE (GOOGLE RESEARCH)

- Developed an imitation learning algorithm [C3] using multimodal representations for improving generalization ability in unseen variations.

*Remote*

*Apr. 2023 - Aug. 2023*

### External Collaborator

HONGLAK LEE (UNIVERSITY OF MICHIGAN)

- Developed an imitation learning algorithm [C3] using multimodal representations for improving generalization ability in unseen variations.
- Developed a reinforcement learning algorithm [W1] for improving generalization ability in varying dynamics.
- Developed a preference-based reinforcement learning algorithm [C2] for modeling non-Markovian human preferences.

*Remote*

*Mar. 2022 - present*

## Machine Learning Engineer

KAKAO, RECOMMENDATION TEAM

- Developed ML platform for recommendation system.
- Developed Python backend for a web application providing data analysis and visualization of Kakao data.
- Implemented data pipeline from user feedback to refined user-item interaction matrix data.
- Deployed DropoutNet for providing qualitative recommendations to cold-start users.

Seongnam, S.Korea

Dec. 2020 - Feb. 2022

## Research Intern

KAKAO, RECOMMENDATION TEAM

- Developed an advanced similar recommendation model for Piccoma (cartoon platform of Kakao Japan).
- Conducted research on relationships between offline/online evaluation on the recommendation system.

Seongnam, S.Korea

Jun. 2020 - Aug. 2020

## Research Intern

DATA SCIENCE GROUP, INSTITUTE OF BASIC SCIENCE

- Conducted research on how much human rights can be granted to robots using AMT (Amazon Mechanical Turk) [C1].
- Implemented BiLSTM model for extracting game highlight by game log.
- Conducted research identifying the "Pilgrimage" articles and analyzing its pattern in Naver News corpora.

Daejeon, S.Korea

Jul. 2019 - Nov. 2020

## Research Interen

NETMARBLE

- Implemented algorithm for detecting "fraud" account in online-game
- Analyzed repetitive group reaction from time-series data of game activities.

Seoul, S.Korea

Jun. 2018 - Aug. 2018

## Honors & Awards

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- 2023 **Travel Award**, International Conference on Learning Representations (ICLR)
- 2019 **Dean's List (Fall Semester)**, Department of Engineering, KAIST
- 2019 **Line Scholarship (Fall Semester)**, School of Computing, KAIST
- 2017 - 19 **National Science and Engineering Scholarship**, Korea Ministry of Science and ICT
- 2017 **Kwanjeong Scholarship (Spring Semester)**, KAIST

Kigali, Rwanda

Daejeon, S.Korea

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Daejeon, S.Korea

## Academic Services

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**Workshop Reviewer** ICML Workshop on New Frontiers in Learning, Control, and Dynamical Systems (Frontiers4LCD) 2023

## Skills

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- ML/DL** Pytorch, Pytorch-lightning, JAX/Flax
- Programming** Python, C++
- Big Data** Kafka, SQL, MongoDB, Hadoop, Trino(Presto)
- DevOps** Git, Docker, Kubernetes
- Languages** Korean (Native), English (Fluent), Japanese (Advanced)