

HYEONAH KIM

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RESEARCH INTERESTS

- RL for **scientific discovery** [4, 5, 8, 9], **LLM reasoning** [9], and **discrete optimization** [1, 2, 3, 7, 9]
- Test-time search for **combinatorial reasoning** [1, 2, 6, 9]

WORK EXPERIENCE

- 4/2025 – Current **Postdoctoral Researcher (Supervisor: Alex Hernandez-Garcia, Co-Supervisor: Yoshua Bengio)** Mila
- Generative active learning for scientific discovery
 - GenAI researcher at PandemicStop-AI project
 - Led by Yves Brun, Louis Vaillancourt, Yoshua Bengio, and Alex Hernandez-Garcia
 - Collaborated with industrial partners (Valence Lab of Recursion, Dreamfold)
 - Off-policy RL for sample efficiency and diversity
- 1/2015 – 6/2017 **Software Engineer** LG CNS
- LG ERP Manufacturing
 - DB engineering (Oracle PL/SQL)

EDUCATION

- 3/2021 – 2/2025 **Ph.D. in Industrial and Systems Engineering** KAIST
System Intelligence Lab. & Computational Optimization Methods Lab.
- 3/2019 – 2/2021 **MS in Industrial Engineering** Seoul National University
Optimization and Operational Research Lab.
- 3/2011 – 2/2015 **BS in Industrial Engineering (Summa Cum Laude)** Hanyang University
Information Design Lab.

PUBLICATIONS

- ICML, 2025 **[9] Neural Genetic Search in Discrete Spaces [paper][code]**
Hyeonah Kim*, Sanghyeok Choi*, Jinkyoo Park, Changhyun Kwon
- ICML, 2025 **[8] Improved Off-policy Reinforcement Learning in Biological Sequence Design [paper][code]**
Hyeonah Kim, Minsu Kim, Taeyoung Yun, Sanghyeok Choi, Emmanuel Bengio, Alex Hernández-García, Jinkyoo Park
- KDD, 2025 **[7] RL4CO: a Unified Reinforcement Learning for Combinatorial Optimization Library [paper][code]**
Federico Berto*, Chuanbo Hua*, Junyoung Park*, Laurin Luttmann*, Yining Ma, Fanchen Bu, Jiarui Wang, Haoran Ye, Minsu Kim, Sanghyeok Choi, Nayeli Gast Zepeda, André Hottung, Jianan Zhou, Jieyi Bi, Yu Hu, Fei Liu, Hyeonah Kim, Jiwoo Son, Haeyeon Kim, Davide Angioni, Wouter Kool, Zhiguang Cao, Qingfu Zhang, Joungho Kim, Jie Zhang, Kijung Shin, Cathy Wu, Sungsoo Ahn, Guojie Song, Changhyun Kwon, Kevin Tierney, Lin Xie, Jinkyoo Park
- AISTATS, 2025 **[6] Ant Colony Sampling with GFlowNets for Combinatorial Optimization [paper][code]**
Minsu Kim*, Sanghyeok Choi*, Hyeonah Kim, Jiwoo Son, Jinkyoo Park, Yoshua Bengio
- NeurIPS, 2024 **[5] Genetic-guided GFlowNets for Sample Efficient Molecular Optimization [paper][code]**
Hyeonah Kim, Minsu Kim, Sanghyeok Choi, Jinkyoo Park
- ICML, 2024 **[4] Symmetric Replay Training: Enhancing Sample Efficiency in Deep Reinforcement Learning for Combinatorial Optimization [paper][code]**
Hyeonah Kim, Minsu Kim, Sungsoo Ahn, Jinkyoo Park
- AAAI, 2024 **[3] Equity-Transformer: Solving NP-hard Min-max Routing Problems as Sequential Generation with Equity Context [paper]**
Jiwoo Son*, Minsu Kim*, Sanghyeok Choi, Hyeonah Kim, Jinkyoo Park
- IJOC, 2024 **[2] A Neural Separation Algorithm for the Rounded Capacity Inequalities [paper]**
INFORMS Journal on Computing (IJOC), 36(4), 987-1005
Hyeonah Kim, Jinkyoo Park, Changhyun Kwon

ICML, 2023

[1] Meta-SAGE: Scale Meta-Learning Scheduled Adaptation with Guided Exploration for Mitigating Scale Shift on Combinatorial Optimization [paper]

Jiwoo Son*, Minsu Kim*, Hyeonah Kim, Jinkyoo Park

HONORS AND AWARDS

9/2025 – 8/2026	Sejong Science Fellowship 2025 Young Scientist Grant Program	National Research Foundation of Korea
12/2024	Google Conference Scholarship NeurIPS 2024 Paper: Genetic-guided GFlowNets for Sample Efficient Molecular Optimization	Google Asia
10/2024	KAIST Graduate Student Outstanding Paper Award 2024 Paper: A Neural Separation Algorithm for the Rounded Capacity Inequalities	KAIST