TAEYOUNG YUN

Ph.D student @ KAIST

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RESEARCH INTEREST

My research interest lies in solving complex and high-dimensional black-box optimization problems through the lens of conditional generative modeling. I'm interested in Diffusion Models, Generative Flow Networks (GFlowNets), and their applications to real-world tasks, e.g, biological sequence design, material discovery, and mechanical design. I'm also interested in various decision making problems such as bandits, Reinforcement Learning and Multi-Agent RL.

Recently, I found out that many crucial problems in ML can be reduced as a posterior inference problem. To this end, I'm currently interested in developing algorithms for amortizing intractable multi-modal posterior inference that can impact real-world applications.

EDUCATION

03/2024 - Current **Ph.D Student in Industrial and Systems Engineering** ***KAIST***

Supervised by Jinkyoo Park

08/2022 - 02/2024 **M.S in Graduate School of AI** ***KAIST***

Supervised by Jinkyoo Park
MS Thesis: Offline Meta Black-box Optimization Framework for Intelligent Traffic Light Management System

03/2018 - 08/2022 **B.S in Industrial and Systems Engineering & Computer Science** ***KAIST***

INTERNSHIPS

06/2025 - 08/2025 **Visiting Intern at Mila** ***Montreal, Canada***

Hosted by Yoshua Bengio
Research related to safety alignment and guardrail.

09/2024 - 03/2025 **Visiting Intern at HKUST** ***Remote***

Hosted by Ling Pan
Fine-tuning LLM with GFlowNets to generate diverse and effective prompts for text-to-image diffusion models.

03/2021 - 08/2021 **Research Intern in Kakao Recommendation Team** ***Seoul, Korea***

Develop contextual bandit algorithms for a personal recommendation.
Analyze the gap between simulation and real-world deployment.

INDUSTRIAL PROJECTS

09/2024 - Current **Traffic Network Layout Optimization** ***Daejeon, Korea***

Collaborate with GS
Develop a Generative model-based design algorithm for optimizing traffic network layout on a given traffic pattern.

03/2023 - 03/2024 **Incentive Design for Managing Taxi Fleet** ***Daejeon, Korea***

Collaborate with ETRI
Develop an RL-based incentive design algorithm for rebalancing taxi fleets to resolve the taxi imbalance problem.

03/2022 - 03/2023 **Traffic Light Optimization** ***Seoul, Korea***

Collaborate with KT

Develop a Bayesian optimization algorithm for managing multiple traffic lights in the real world to reduce congestion.

PUBLICATIONS

*: Equal Contribution

2025

Arxiv, 2025 **Posterior Inference in Latent Space for Scalable Constrained Black-box Optimization**
Kiyoung Om*, Kyuil Sim*, **Taeyoung Yun***, Hyeongyu Kang, and Jinkyoo Park
Paper / Code

KDD, 2025 **Wind Farm Layout Optimization with Diffusion Models**
Yujin Shin*, **Taeyoung Yun***, Sujin Yun, Sungpil Woo, Sunhwan Lim, and Jinkyoo Park
Paper / Code

ICML, 2025 **Posterior Inference with Diffusion Models for High-dimensional Black-box Optimization**
Taeyoung Yun*, Kiyoung Om*, Jaewoo Lee, Sujin Yun, and Jinkyoo Park
Paper / Code

ICML, 2025 (Based on NIPSW) **Improved Off-Policy Reinforcement Learning in Biological Sequence Design**
Hyeonah Kim, Minsu Kim, **Taeyoung Yun**, Sanghyeok Choi, Emmanuel Bengio, Alex Hernández Garcia, and Jinkyoo Park
Paper / Code

CVPR, 2025 **Learning to Sample Effective and Diverse Prompts for Text-to-Image Generation**
Taeyoung Yun, Dinghuai Zhang, Jinkyoo Park, and Ling Pan
Paper / Code

ICLR, 2025 **Adaptive Teachers for Amortized Samplers**
Minsu Kim*, Sanghyeok Choi*, **Taeyoung Yun**, Emmanuel Bengio, Leo Feng, Jarrid Rector-Brooks, Sungsoo Ahn, Jinkyoo Park, Nikolay Malkin, and Yoshua Bengio
Paper / Code

2024

NeurIPS, 2024 **Guided Trajectory Generation with Diffusion Models for Offline Model-based Optimization**
Taeyoung Yun, Sujin Yun, Jaewoo Lee, and Jinkyoo Park
Paper / Code

NeurIPS, 2024 (based on ICLRW) **GTA: Generative Trajetory Augmentation with Guidance for Offline Reinforcement Learning**
Jaewoo Lee*, Sujin Yun*, **Taeyoung Yun**, and Jinkyoo Park
Paper / Code

KDD, 2024 **An Offline Meta Black-box Optimization Framework for Adaptive Design of Urban Traffic Light Management Systems**
Taeyoung Yun*, Kanghoon Lee*, Sujin Yun, Ilmyung Kim, Won-Woo Jung, Min-Cheol Kwon, Kyujin Choi, Yoohyeon Lee, and Jinkyoo Park
Paper / Code

ICML, 2024 (based on NIPSW) **Learning to Scale Logits for Temperature-conditional GFlowNets**
Minsu Kim*, Juhwan Ko*, **Taeyoung Yun***, Dinghuai Zhang, Ling Pan, Woochang Kim, Jinkyoo Park, and Yoshua Bengio
Paper / Code

ICLR, 2024 (Spotlight)

Local Search GFlowNets
Minsu Kim, **Taeyoung Yun**, Emmanuel Bengio, Dinghuai Zhang, Yoshua Bengio, Sungsoo Ahn, and Jinkyoo Park
Paper / Code

TEACHING EXPERIENCES

2024 **Teaching Assistant** ***KAIST***
IE481: Manufacturing & Artificial Intelligence

2023,2024 **Teaching Assistant** ***KAIST***
IE437: Data-Driven Decision Making and Control

2022 **Teaching Assistant** ***KAIST***
MAS480: Introduction to Scientific Machine Learning

ACADEMIC SERVICES

2025 **Reviewer**
ICLR, AAMAS, AISTATS, ICML, KDD, TMLR

HONORS & AWARDS

2021 **Dean's List** ***KAIST***
Honor for Top 2% Students

2021 **Excellence Award (2nd Place)** ***Seoul, Korea***
Big Data Competition Hosted by NH