JAEHYEONG JO

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RESEARCH INTERESTS

My research interest mainly focuses on understanding physical systems through the lens of graph-structured data and its geometric symmetries. In particular, I've been focusing on the generation of the graph with diffusion models and its applications to real-world tasks, for example, drug discovery or protein design.

PUBLICATIONS

Graph Generation with Destination-Driven Diffusion Mixture
Jaehyeong Jo*, Dongki Kim*, and Sung Ju Hwang
Preprint, arXiv:2302.03596

Exploring Chemical Space with Score-based Out-of-distribution Generation
Seul Lee, Jaehyeong Jo, and Sung Ju Hwang
Preprint, arXiv:2206.07632

Score-based Generative Modeling of Graphs via the System of Stochastic Differential Equations
Jaehyeong Jo*, Seul Lee*, and Sung Ju Hwang
International Conference on Machine Learning (**ICML**), 2022

Edge Representation Learning with Hypergraphs
Jaehyeong Jo*, Jinheon Baek*, Seul Lee*, Dongki Kim, Minki Kang and Sung Ju Hwang
Neural Information Processing Systems (**NeurIPS**), 2021

* denotes equal contribution.

RESEARCH EXPERIENCE

MLAI (Machine Learning & Artificial Intelligence) Lab, KAIST — Seoul, Korea
Research Assistant (Advisor: Prof. Sung Ju Hwang) — Sep. 2021 - Present
· Conducting research on graph generative model with applications to drug discovery.

Kimlab, UofT — Toronto, Canada
Visiting student (Host: Prof. Philip Kim) — Feb. 2023 - Feb. 2023
· Conducting research on protein generative model with diffusion models.

PAI (Probability Artificial Intelligence) Lab, KAIST — Daejeon, Korea
Research Assistant (Advisor: Prof. Ganguk Hwang) — Mar. 2020 - Aug. 2021
· Conducted research on graphs (edge representation learning using hypergraph structure).

TALKS

Generation of Graph-Structured Data with Diffusion Models — Toronto, Canada
in University of Toronto (UofT) — Feb 2023

Score-based Generative Modeling of Graphs via the SDEs — Online
in LoGaG: Learning on Graphs and Geometry Reading Group — Oct. 2022

Learning with Graph Structure Data — Pohang, Korea
in Pohang University of Science and Technology (POSTECH) — July 2022

Score-based Graph Generation for Material Design Suwon, Korea
in Samsung Advanced Institute of Technology (SAIT) Jun. 2022

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST) Seoul, Korea
Ph.D. in Artificial Intelligence Sep. 2021 - Present
Advisor: Proffesor Sung Ju Hwang

Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea
M.S. in Mathematical Sciences Mar. 2020 - Aug. 2021
Advisor: Professor Ganguk Hwang

Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea
B.S. in Mathematical Sciences Mar. 2016 - Feb. 2020
Minor in Computer Science & Engineering
GPA: 3.75/4.3

ACADEMIC SERVICES

Conference Reviewers

· Learning on Graphs Conference (LoG), 2022
· Conference on Neural Information Processing Systems (**NeurIPS**), 2022
· International Conference on Machine Learning **(ICML)**, 2022, 2023