

JAEHYEONG JO

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RESEARCH INTERESTS

My research interest lies in understanding physical systems through the lens of geometrical structures, especially in the context of generative modeling. Previous works focus on the generation of geometrical structures with diffusion models, including graphs and data on Riemannian manifolds, and their applications to real-world tasks, e.g., drug discovery, protein design, and neural architecture search.

PREPRINTS

Generative Modeling on Manifolds Through Mixture of Riemannian Diffusion Processes

Jaehyeong Jo, Sung Ju Hwang

Preprint, 2023

Graph Generation with Destination-Driven Diffusion Mixture

Jaehyeong Jo*, Dongki Kim*, Sung Ju Hwang

Machine Learning for Drug Discovery Workshop at International Conference on Learning Representations (MLDD Workshop @ ICLR), 2023

* denotes equal contribution.

CONFERENCE PUBLICATIONS

DiffusionNAG: Task-guided Neural Architecture Generation with Diffusion Models

Sohyun An*, Hayeon Lee*, Jaehyeong Jo, Seanie Lee, Sung Ju Hwang

International Conference on Learning Representations (ICLR), 2024

Text-Conditioned Sampling Framework for Text-to-Image Generation with Masked Generative Models

Jaewoong Lee*, Sangwon Jang*, Jaehyeong Jo, Jaehong Yoon, Yunji Kim, Jin-Hwa Kim, Jung-Woo Ha, Sung Ju Hwang

International Conference on Computer Vision (ICCV), 2023

Exploring Chemical Space with Score-based Out-of-distribution Generation

Seul Lee, Jaehyeong Jo, Sung Ju Hwang

International Conference on Machine Learning (ICML), 2023

Score-based Generative Modeling of Graphs via the System of Stochastic Differential Equations

Jaehyeong Jo*, Seul Lee*, 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, Sung Ju Hwang

Neural Information Processing Systems (NeurIPS), 2021

* denotes equal contribution.

RESEARCH EXPERIENCE

MLAI (Machine Learning & Artificial Intelligence) Lab, KAIST

Research Assistant (Advisor: Prof. Sung Ju Hwang)

Seoul, Korea

Sep. 2021 - Present

- Conducting research on diffusion-based generative models with applications to real-world tasks such as drug discovery.

Kimlab, UofT

Visiting student (Host: Prof. Philip Kim)

Toronto, Canada
Feb. 2023 - Feb. 2023

- Conducting research on protein generative model with diffusion models.

PAI (Probability Artificial Intelligence) Lab, KAIST

Research Assistant (Advisor: Prof. Ganguk Hwang)

Daejeon, Korea
Mar. 2020 - Aug. 2021

- Conducted research on graphs (edge representation learning using hypergraph structure).

TALKS

Generation of Graph-Structured Data with Diffusion Models

in University of Toronto (UofT)

Toronto, Canada
Feb 2023

Score-based Generative Modeling of Graphs via the SDEs

in LoGaG: Learning on Graphs and Geometry Reading Group

Online
Oct. 2022

Learning with Graph Structure Data

in Pohang University of Science and Technology (POSTECH)

Pohang, Korea
July 2022

Score-based Graph Generation for Material Design

in Samsung Advanced Institute of Technology (SAIT)

Suwon, Korea
Jun. 2022

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

Ph.D. in Artificial Intelligence

Advisor: Prof. Sung Ju Hwang

Seoul, Korea
Sep. 2021 - Present

Korea Advanced Institute of Science and Technology (KAIST)

M.S. in Mathematical Sciences

Advisor: Prof. Ganguk Hwang

Daejeon, Korea
Mar. 2020 - Aug. 2021

Korea Advanced Institute of Science and Technology (KAIST)

B.S. in Mathematical Sciences

Minor in Computer Science & Engineering

GPA: 3.75/4.3

Daejeon, Korea
Mar. 2016 - Feb. 2020

ACADEMIC SERVICES

Conference Reviewers

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