JINWOO KIM

Ph.D. Student
Graph & Geometric DL

jw9730.github.io
jinwoo-kim@kaist.ac.kr

Education

M.S./Ph.D. in Computer Science Mar 2021 – Feb 2026 (expected)
Korea Advanced Institute of Science and Technology (KAIST) South Korea
• Advisor: Seunghoon Hong
• Research focus: Deep learning for graphs and structured data.

B.S. in Brain Engineering and Computer Science (Double Major) Mar 2016 – Feb 2021
Korea Advanced Institute of Science and Technology (KAIST) South Korea
• GPA 4.05/4.3 (Summa Cum Laude)

Experience

New York University, Visiting Scholar Nov 2025 – Jan 2026
Host: Kyunghyun Cho New York, NY, US

LG AI Research, Research Intern Jan – Jul 2022
Host: Moontae Lee, Honglak Lee South Korea

Publications

(P: preprint, C: conference, J: journal, W: workshop, *: equal contribution)

[P2] **Inverting Data Transformations via Diffusion Sampling**
Jinwoo Kim*, Sékou-Oumar Kaba*, Jiyun Park, Seunghoon Hong, Siamak Ravanbakhsh
Under Review 2025

[P1] **Flock: A Knowledge Graph Foundation Model via Learning on Random Walks**
Jinwoo Kim*, Xingyue Huang*, Krzysztof Olejniczak, Kyungbin Min, Michael Bronstein, Seunghoon Hong,
İsmail İlkan Ceylan
arXiv 2025

[C11] **Sequence Modeling with Spectral Mean Flows**
Jinwoo Kim, Max Beier, Petar Bevanda, Nayun Kim, Seunghoon Hong
NeurIPS 2025

[C10] **Revisiting Random Walks for Learning on Graphs**
Jinwoo Kim, Olga Zaghen*, Ayhan Suleymanzade*, Youngmin Ryou, Seunghoon Hong
ICLR 2025; ICML 2024 GRaM Workshop
Spotlight Presentation (380/11672=3.26%)

[C9] **3D Denoisers are Good 2D Teachers: Molecular Pretraining via Denoising and Cross-Modal Distillation**
Sungjun Cho, Dae-Woong Jeong, Sung Moon Ko, Jinwoo Kim, Sehui Han, Seunghoon Hong, Honglak Lee,
Moontae Lee
AAAI 2025
Oral Presentation

[C8] **Simulation-Free Training of Neural ODEs on Paired Data**
Semin Kim*, Jaehoon Yoo*, Jinwoo Kim, Yeonwoo Cha, Saehoon Kim, Seunghoon Hong
NeurIPS 2024

[W1] **Learning Symmetrization for Equivariance with Orbit Distance Minimization**
Tien Dat Nguyen*, Jinwoo Kim*, Hongseok Yang, Seunghoon Hong
NeurIPS 2023 NeurReps Workshop

[C7] **Learning Probabilistic Symmetrization for Architecture Agnostic Equivariance**
Jinwoo Kim, Tien Dat Nguyen, Ayhan Suleymanzade, Hyeokjun An, Seunghoon Hong
NeurIPS 2023
Spotlight Presentation (378/12345=3.06%)

[C6] **Universal Few-shot Learning of Dense Prediction Tasks with Visual Token Matching**
Donggyun Kim, Jinwoo Kim, Seongwoong Cho, Chong Luo, Seunghoon Hong
ICLR 2023
Outstanding Paper Award (4/4955=0.08%)

[C5] **Pure Transformers are Powerful Graph Learners**
Jinwoo Kim, Tien Dat Nguyen, Seonwoo Min, Sungjun Cho, Moontae Lee, Honglak Lee, Seunghoon Hong
NeurIPS 2022

[C4] **Transformers meet Stochastic Block Models: Attention with Data-Adaptive Sparsity and Cost**
Sungjun Cho, Seonwoo Min, Jinwoo Kim, Moontae Lee, Honglak Lee, Seunghoon Hong
NeurIPS 2022

[C3] **Equivariant Hypergraph Neural Networks**
Jinwoo Kim, Saeyoon Oh, Sungjun Cho, Seunghoon Hong
ECCV 2022

[C2] **Transformers Generalize DeepSets and Can be Extended to Graphs and Hypergraphs**
Jinwoo Kim, Saeyoon Oh, Seunghoon Hong
NeurIPS 2021

[C1] **SetVAE: Learning Hierarchical Composition for Generative Modeling of Set-Structured Data**
Jinwoo Kim*, Jaehoon Yoo*, Juho Lee, Seunghoon Hong
CVPR 2021

[J1] **Spontaneous Retinal Waves Can Generate Long-Range Horizontal Connectivity in Visual Cortex**
Jinwoo Kim*, Min Song*, Jaeson Jang, Se-Bum Paik
The Journal of Neuroscience 40(34) 2020

Honors

Awards

• **Outstanding Researcher Award**, KAIST-Mila Prefrontal AI Research Center	2024
• **ELLIS Mobility Grant** [C10], ICML 2024 GRaM Workshop	2024
• **Outstanding Paper Award** [C6], ICLR 2023	2023
• **Samsung Humantech Paper Award** [C6], Silver Prize	2023
• **Qualcomm Innovation Fellowship Korea** [C2]	2022
• **KAIST Engineering Innovator Award**	2020

Scholarships and fellowships

• **Kwanjeong Education Foundation Scholarship**	2022 – 2023
• **Korea National Science & Technology Scholarship**	2018 – 2019
• **KAIST Alumni Fellowship**	2017 – 2020
• **KAIST Presidential Fellowship**	2016 – 2020
• **Hansung Scholarship for Gifted Students**	2015 – 2016

Invited Talks

Extrinsic Symmetries for Neural Networks [C7, W1, C10]

• Mila – Quebec AI Institute (Host: Minsu Kim, Junyeob Baek)	Jul 2025
• KAIST AI899 Geometric DL (Host: Sungsoo Ahn)	May 2025
• Mila – Quebec AI Institute (Host: Siamak Ravanbakhsh, Sékou-Oumar Kaba)	Dec 2024
• KAIST–Mila Prefrontal AI Research Center (Host: Sungjin Ahn)	Nov 2024
• Sungkyunkwan University (SKKU) (Host: Chang Woo Myung)	Aug 2024
• Pohang University of Science and Technology (POSTECH) (Host: Sungsoo Ahn)	Nov 2023

Universal Few-shot Learning of Dense Prediction Tasks with Visual Token Matching [C6]

• KAIST–Samsung Electronics DS Division Exchange Meetup (Host: Chulmoo Kang)	Aug 2023

Pure Transformers are Powerful Graph Learners [C5]

• Microsoft USA (Host: Nabiha Asghar)	Jan 2023
• NeurIPS 2022 at KAIST (Host: Dongkwan Kim)	Nov 2022
• Learning on Graphs and Geometry Reading Group (LoGaG) (Host: Hannes Stärk)	Aug 2022

Higher-order Transformers for Sets, Graphs, and Hypergraphs [C2]

• Qualcomm Korea (Host: Jaewon Choi)	Jan 2023
• KAIST AI Workshop 21/22 (Host: Dongkwan Kim)	Jan 2022
• NeurIPS 2021 Social: ML in Korea (Host: Jung-Woo Ha)	Dec 2021

Hierarchical Variational Autoencoders for Generative Modeling of Sets [C1]

• Naver AI Author Meetup for CVPR 2021 (Host: Jung-Woo Ha)	Sep 2021
• Korean Conference on Computer Vision 2021 (Host: Jongwoo Lim)	Sep 2021

Retinal Waves and Prenatal Wiring of Primary Visual Cortex [J1]
- Society for Neuroscience, Chicago, IL, US   Oct 2019

Academic Services

Conference Reviewer: AISTATS 2025–2026, ICLR 2025, NeurIPS 2022–2025, ICML 2023–2025, IJCNN 2025, LoG 2022–2025, ICCV 2025 SP4V Workshop, ICML 2024 GRaM Workshop, CVPR 2022, ACCV 2022
Journal Reviewer: IJCV 2025, TMLR 2024, Neural Networks 2023

Teaching

Teaching Assistant, KAIST School of Computing
- Undergraduate Research Program (URP)   2022, 2024
- Introduction to Deep Learning (CS492I)   2021, 2022, 2023
- Computer Vision (CS576)   2022, 2023
- School of Computing Colloquium (CS966/CS986)   2021

Teaching Assistant, Samsung Electronics
- Samsung Research AI Expert Program   2021 – 2024

Student Mentoring and Collaboration
- Kyungbin Min, B.S. Student @ KAIST   2025 – present
- Jiyun Park, B.S. Student @ KAIST   2024 – present
- Nayun Kim, B.S. Student @ KAIST [C11]   2024
- Youngmin Ryou, B.S. Student @ KAIST [C10] → on leave for mandatory military service   2023 – 2024
- Nicole Shen, B.S. Student @ MIT → Intern @ MIT LIDS   2024
- Semin Kim, M.S. Student @ KAIST [C8] → Ph.D. Student @ KAIST   2023 – 2024
- Ayhan Suleymanzade, B.S. Student @ KAIST [C7, C10] → Intern @ TU Munich   2023 – 2024
- Olga Zaghen, M.S. Student @ UniTrento [C10] → Ph.D. Student @ UvA Amsterdam   2023
- Tien Dat Nguyen, B.S. Student @ KAIST [C5, C7, W1] → M.S. Student @ UWaterloo   2021 – 2023
- Daniel Sungho Jung, B.S. Student @ Penn State → Ph.D. Student @ SNU   2021
- Saeyoon Oh, B.S. Student @ KAIST [C2, C3] → Engineer @ FuriosaAI   2021

Projects

Extending Language Models for Physical Data Understanding   2024 – 2025
Korea National Research Foundation (NRF)
Image Inpainting with Visual Commonsense Reasoning   2021 – 2023
Korea Ministry of Science and ICT
Cooperative Intelligence for Heterogeneous Robots   2021 – 2023
Korea National Research Foundation (NRF)

References

Seunghoon Hong, Associate Professor at KAIST   seunghoon.hong@kaist.ac.kr