

JINWOO KIM

Ph.D. Student
Graph & Geometric DL

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Education

M.S./Ph.D. in Computer Science <i>Korea Advanced Institute of Science and Technology (KAIST)</i> <ul style="list-style-type: none">• Advisor: Prof. Seunghoon Hong• Research focus: Deep learning algorithms for graphs and structured data.	Mar 2021 – present South Korea
B.S. in Brain Engineering and Computer Science (Double Major) <i>Korea Advanced Institute of Science and Technology (KAIST)</i> <ul style="list-style-type: none">• GPA 4.05/4.3 (Summa Cum Laude)	Mar 2016 – Feb 2021 South Korea

Publications

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

- [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
- [C8] **Simulation-Free Training of Neural ODEs on Paired Data**
Semin Kim*, Jaehoon Yoo*, Jinwoo Kim, Yeonwoo Cha, Saehoon Kim, Seunghoon Hong
NeurIPS 2024
- [W2] **Revisiting Random Walks for Learning on Graphs**
Jinwoo Kim, Olga Zaghen*, Ayhan Suleymanzade*, Youngmin Ryou, Seunghoon Hong
ICML 2024 Workshop on Geometry-grounded Representation Learning and Generative Modeling
- [W1] **Learning Symmetrization for Equivariance with Orbit Distance Minimization**
Tien Dat Nguyen*, Jinwoo Kim*, Hongseok Yang, Seunghoon Hong
NeurIPS 2023 Workshop on Symmetry and Geometry in Neural Representations
- [C7] **Learning Probabilistic Symmetrization for Architecture Agnostic Equivariance**
Jinwoo Kim, Tien Dat Nguyen, Ayhan Suleymanzade, Hyeokjun An, Seunghoon Hong
NeurIPS 2023 (**Spotlight Presentation**)
- [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**)
- [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

Work Experience

LG AI Research Fundamental Research Lab (FRL) <i>Research Intern (Mentors: Prof. Moontae Lee, Prof. Honglak Lee)</i> • Published 3 papers at NeurIPS & ECCV on transformers for graphs [C5, C3] and efficient transformers [C4].	Jan – Jul 2022 South Korea
KAIST Vision and Learning Lab <i>Undergraduate Research Intern (Mentors: Prof. Seunghoon Hong, Prof. Juho Lee)</i> • Published a paper at CVPR [C1] on transformer-based hierarchical variational autoencoders for sets.	2020 South Korea
KAIST Visual Systems Neural Network Lab <i>Undergraduate Research Intern (Mentor: Prof. Se-Bum Paik)</i> • Published a paper at JNeuro [J1] on a computational model of the prenatal wiring of the visual cortex.	2018 – 2019 South Korea
Korea Institute of Basic Science (IBS) Social Neuroscience Group <i>Undergraduate Research Assistant (Mentor: Dr. Doyun Lee)</i> • Assisted research on ensemble perception of motion.	2017 South Korea

Honors & Awards

Outstanding Researcher Award <i>KAIST-Mila Prefrontal AI Research Center</i> • For studies on geometric deep learning and graph neural networks.	2024
ELLIS Mobility Grant (€800) <i>ICML Workshop on Geometry-grounded Representation Learning and Generative Modeling</i> • For Random Walk Neural Networks (ICML 2024 GRaM Workshop) [W2].	2024
ICLR Outstanding Paper Award <i>International Conference on Learning Representations (ICLR)</i> • As a coauthor of Visual Token Matching (ICLR 2023) [C6].	2023
Samsung Humantech Paper Award Silver Prize (\$7,000) <i>Samsung Electronics Co., Ltd.</i> • As a coauthor of Visual Token Matching (ICLR 2023) [C6].	2023
Kwanjeong Education Foundation Scholarship (\$20,000) <i>Kwanjeong Educational Foundation</i>	2022 – 2023
Qualcomm Innovation Fellowship Korea (\$4,000) <i>Qualcomm Technologies, Inc.</i> • For Higher-order Transformers (NeurIPS 2021) [C2].	2022
KAIST Undergraduate Research Program Excellence Award <i>Korea Advanced Institute of Science and Technology (KAIST)</i> • As a mentor for the undergraduate research project by Tien Dat Nguyen.	2022
KAIST Engineering Innovator Award <i>Korea Advanced Institute of Science and Technology (KAIST)</i> • Granted to 5 undergraduate students for outstanding achievements.	2020
Korea National Science & Technology Scholarship (\$13,000) <i>Korea Ministry of Science and ICT</i>	2018 – 2019
KAIST Alumni Fellowship (\$12,000) <i>Korea Advanced Institute of Science and Technology (KAIST)</i>	2017 – 2020
KAIST Presidential Fellowship (\$10,000) <i>Korea Advanced Institute of Science and Technology (KAIST)</i>	2016 – 2020
KAIST Dean's List <i>Korea Advanced Institute of Science and Technology (KAIST)</i> • Awarded for outstanding academic performance 3 times (spring 2016, fall 2016, spring 2018).	2016 – 2018
Hansung Scholarship for Gifted Students (\$10,000) <i>Hansung Sonjaehan Scholarship Foundation</i>	2015 – 2016

Skills

Languages: English (Conversational), Korean (Native), Japanese (Introductory)
Programming Languages: Python, C, C++ R, MATLAB
Deep Learning Frameworks: PyTorch, Lightning, PyG, Transformers, JAX, CUDA
Miscellaneous: Linux, Git, Docker, L^AT_EX, Markdown, Adobe Illustrator

Invited Talks

Geometric deep learning with general-purpose neural networks (on [C7, W1, W2])
@ Mila - Quebec AI Institute (Host: Siamak Ravanbakhsh) Dec 2024
@ KAIST-Mila Prefrontal AI Research Center (Host: Sungjin Ahn) Nov 2024

Learning probabilistic symmetrization for architecture agnostic equivariance (on [C7])
@ 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 (on [C6])
@ KAIST-Samsung Electronics DS Division Exchange Meetup (Host: Chulmoo Kang) Aug 2023

Pure transformers are powerful graph learners (on [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 (on [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 (on [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 the primary visual cortex (on [J1])
@ Society for Neuroscience, Chicago, IL, US Oct 2019

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
• Nayun Kim, B.S. Student @ KAIST 2024 – present
• Jiyun Park, B.S. Student @ KAIST 2024 – present
• Youngmin Ryou, B.S. Student @ KAIST (on [W2]) 2023 – present
• Nicole Shen, B.S. Student @ MIT 2024
• Semin Kim, M.S. Student @ KAIST (on [C8]) → Ph.D. Student @ KAIST 2023 – 2024
• Ayhan Suleymanzade, B.S. Student @ KAIST (on [C7, W2]) 2023 – 2024
• Olga Zaghen, M.S. Student @ UniTrento (on [W2]) → Ph.D. Student @ UvA Amsterdam 2023
• Tien Dat Nguyen, B.S. Student @ KAIST (on [C5, C7, W1]) → M.S. Student @ UWaterloo 2021 – 2023
• Ali Ahmed Sheikh, B.S. Student @ KAIST 2023
• Hyeokjun An, M.S. Student @ KAIST (on [C7]) 2023
• Daniel Sungho Jung, B.S. Student @ Penn State → Ph.D. Student @ SNU 2021
• Saeyoon Oh, B.S. Student @ KAIST (on [C2, C3]) → Engineer @ FuriosaAI 2021

Academic Services

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

Projects

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

References

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