

# JINWOO KIM

Ph.D. Student  
Graph & Geometric DL

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## Education

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

## Publications

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

- [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)*
- [P1] **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  
*arXiv 2023*
- [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

<b>LG AI Research Fundamental Research Lab (FRL)</b> <i>Research Intern (Mentors: Prof. Moontae Lee, Prof. Honglak Lee)</i> <ul style="list-style-type: none"><li>• Published 3 papers at NeurIPS &amp; ECCV on transformers for graphs [C5, C3] and efficient transformers [C4].</li></ul>	Jan – Jul 2022 South Korea
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<b>KAIST Vision and Learning Lab</b>	2020
<i>Undergraduate Research Intern (Mentors: Prof. Seunghoon Hong, Prof. Juho Lee)</i>	<i>South Korea</i>
• Published a paper at CVPR [C1] on transformer-based hierarchical variational autoencoders for sets.	
<b>KAIST Visual Systems Neural Network Lab</b>	2018 – 2019
<i>Undergraduate Research Intern (Mentor: Prof. Se-Bum Paik)</i>	<i>South Korea</i>
• Published a paper at JNeuro [J1] on a computational model of the prenatal wiring of the visual cortex.	
<b>Korea Institute of Basic Science (IBS) Social Neuroscience Group</b>	2017
<i>Undergraduate Research Assistant (Mentor: Dr. Doyun Lee)</i>	<i>South Korea</i>
• Assisted research on ensemble perception of motion.	

## Honors & Awards

<b>ICLR Outstanding Paper Award</b>	2023
<i>International Conference on Learning Representations (ICLR)</i>	
• As a coauthor of Visual Token Matching (ICLR 2023) [C6].	
<b>Samsung Humantech Paper Award Silver Prize (\$7,000)</b>	2023
<i>Samsung Electronics Co., Ltd.</i>	
• As a coauthor of Visual Token Matching (ICLR 2023) [C6].	
<b>Kwanjeong Education Foundation Scholarship (\$20,000)</b>	2022 – 2023
<i>Kwanjeong Educational Foundation</i>	
<b>Qualcomm Innovation Fellowship Korea (\$4,000)</b>	2022
<i>Qualcomm Technologies, Inc.</i>	
• For Higher-order Transformers (NeurIPS 2021) [C2].	
<b>KAIST Undergraduate Research Program Excellence Award</b>	2022
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	
• As a mentor for the undergraduate research project by Tien Dat Nguyen.	
<b>KAIST Engineering Innovator Award</b>	2020
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	
• Granted to 5 undergraduate students for outstanding achievements.	
<b>Korea National Science &amp; Technology Scholarship (\$13,000)</b>	2018 – 2019
<i>Korea Ministry of Science and ICT</i>	
<b>KAIST Alumni Fellowship (\$12,000)</b>	2017 – 2020
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	
<b>KAIST Presidential Fellowship (\$10,000)</b>	2016 – 2020
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	
<b>KAIST Dean's List</b>	2016 – 2018
<i>Korea Advanced Institute of Science and Technology (KAIST)</i>	
• Awarded for outstanding academic performance 3 times (spring 2016, fall 2016, spring 2018).	
<b>Hansung Scholarship for Gifted Students (\$10,000)</b>	2015 – 2016
<i>Hansung Sonjaehan Scholarship Foundation</i>	

## Skills

<b>Languages:</b> English (Conversational), Korean (Native), Japanese (Introductory)
<b>Programming Languages:</b> Python (Advanced), C, R, MATLAB
<b>Deep Learning Frameworks:</b> PyTorch (Advanced), JAX (Intermediate), CUDA (Intermediate)
<b>Miscellaneous:</b> Linux, Git, Docker, L <sup>A</sup> T <sub>E</sub> X, Markdown, Adobe Illustrator

## Invited Talks

<b>Learning probabilistic symmetrization for architecture agnostic equivariance</b> (on [C7])	
@ Pohang University of Science and Technology (POSTECH) (Host: Sungsoo Ahn)	Nov 2023
<b>Universal few-shot learning of dense prediction tasks with visual token matching</b> (on [C6])	
@ KAIST–Samsung Electronics DS Division Exchange Meetup (Host: Chulmoo Kang)	Aug 2023

<b>Pure transformers are powerful graph learners</b> (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
<b>Higher-order transformers for sets, graphs, and hypergraphs</b> (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
<b>Hierarchical variational autoencoders for generative modeling of sets</b> (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
<b>Retinal waves and prenatal wiring of the primary visual cortex</b> (on [J1])	
@ Society for Neuroscience, Chicago, IL, US	Oct 2019

## Teaching

<b>Teaching Assistant, KAIST School of Computing</b>	
• Computer Vision (CS576)	2022, 2023
• Introduction to Deep Learning (CS492I)	2021, 2022, 2023
• Undergraduate Research Program (URP) ( <b>Excellence Award</b> )	2022
• School of Computing Colloquium (CS966/CS986)	2021
<b>Teaching Assistant, Samsung Electronics</b>	
• Samsung Research AI Expert Program	2021, 2022, 2023
<b>Student Mentoring</b>	
• Youngmin Ryou, B.S. Student @ KAIST	Nov 2023 – present
• Semin Kim, M.S. Student @ KAIST	Jul 2023 – present
• Ali Ahmed Sheikh, B.S. Student @ KAIST	Jul 2023 – present
• Ayhan Suleymanzade, B.S. Student @ KAIST (on [C7])	Feb 2023 – present
• Olga Zaghen, M.S. Student @ University of Trento	2023
• Tien Dat Nguyen, B.S. Student @ KAIST (on [C5, C7, W2])	2021 – 2023
• Hyeokjun An, M.S. Student @ KAIST (on [C7])	2023
• Daniel Sungho Jung, B.S. Student @ Penn State, PA, US → Ph.D. Student @ SNU	2021
• Saeyoon Oh, B.S. Student @ KAIST (on [C2, C3]) → @ VESSL AI	2021

## Academic Services

**Conference Reviewer:** NeurIPS 2022 – 2023, ICML 2023, CVPR 2022, LoG 2022 – 2023, ACCV 2022  
**Journal Reviewer:** Neural Networks 2023

## Projects

<b>Image Inpainting with Visual Commonsense Reasoning</b>	2021 – 2023
<i>Korea Ministry of Science and ICT</i>	
<b>Cooperative Intelligence for Heterogeneous Robots</b>	2021 – 2023
<i>Korea National Research Foundation (NRF)</i>	

## References

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