

# Sungwon Kim

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## RESEARCH INTEREST

Physics AI (Engineering), 3D Simulation, Data-driven AI, Data-Efficient Learning

## PROFESSIONAL EXPERIENCE

**AI SOFTWARE OF KOREA**, Seoul, South Korea

- Co-CEO, Co-Founder Jul 2019 – Feb 2022
  - Development of AI for Socially Vulnerable Groups (information disadvantaged, older persons, children)
  - Management

## EDUCATION

**KAIST (Korea Advanced Institute of Technology)**, Daejeon, South Korea

- Ph.D. in Graduate School of Data Science Feb 2024 – Present
  - Research Interest: Learning-based 3D Simulation
  - Adviser: [Prof. Chanyoung Park](#)
- M.S. in Graduate School of Data Science Feb 2022 – Feb 2024
  - Research Interest: Data-efficient Learning, Federated Learning
  - Adviser: [Prof. Chanyoung Park](#)

**Korea University**, Seoul, South Korea

Mar 2014 – Feb 2022

- B.S. in Civil, Environmental and Architectural Engineering

## PUBLICATIONS

(\*: Equal contribution)

## CONFERENCES

- [C10] **Disentangling Hyperedges through the lens of Category Theory**  
Yoonho Lee, Junseok Lee, Sangwoo Seo, **Sungwon Kim**, Yeongmin Kim, Chanyoung Park  
**NeurIPS 2025** - The Thirty-Ninth Annual Conference on Neural Information Processing Systems
- [C9] **Thickness-aware E(3)-Equivariant 3D Mesh Neural Networks**  
**Sungwon Kim**, Namkyeong Lee, Yunyoung Doh, Seungmin Shin, Guimok Cho, Seung-Won Jeon, Sangkook Kim, Chanyoung Park  
**ICML 2025** - Forty-Second International Conference on Machine Learning
- [C8] **Subgraph Federated Learning for Local Generalization**  
**Sungwon Kim**, Yoonho Lee, Yunhak Oh, Namkyeong Lee, Sukwon Yun, Junseok Lee, Sein Kim, Carl Yang, Chanyoung Park  
**ICLR 2025 (Oral, top 1.8%)** - The Thirteenth International Conference on Learning Representations
- [C7] **Self-Explainable Temporal Graph Networks based on Graph Information Bottleneck**  
Sangwoo Seo, **Sungwon Kim**, Jihyeong Jung, Yoonho Lee, Chanyoung Park  
**KDD 2024** - ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- [C6] **Unsupervised Episode Generation for Graph Meta-learning**  
Jihyeong Jung, Sangwoo Seo, **Sungwon Kim**, Chanyoung Park  
**ICML 2024** – International Conference on Machine Learning
- [C5] **DSLRL: Diversity Enhancement and Structure Learning for Rehearsal-based Graph Continual Learning**  
Seungyeon Choi\*, Wonjoong Kim\*, **Sungwon Kim**, Yeonjun In, Sein Kim, Chanyoung Park  
**WWW 2024 (Oral)** – The Web Conference
- [C4] **Interpretable Prototype-based Graph Information Bottleneck**  
Sangwoo Seo, **Sungwon Kim**, Chanyoung Park  
**NeurIPS 2023** - In Conference on Neural Information Processing Systems (NeurIPS)  
- **Gold Prize at the 2023 Samsung Humantech Paper Award**
- [C3] **Density of States Prediction of Crystalline Materials via Prompt-guided Multi-Modal Transformer**  
Namkyeong Lee\*, Heewoong Noh\*, **Sungwon Kim**, Dongmin Hyun, Gyoung S. Na, Chanyoung Park  
**NeurIPS 2023** - In Conference on Neural Information Processing Systems (NeurIPS)
- [C2] **Task-Equivariant Graph Few-shot Learning**  
**Sungwon Kim**, Junseok Lee, Namkyeong Lee, Wonjoong Kim, Seungyeon Choi, Chanyoung Park  
**KDD 2023** - ACM SIGKDD Conference on Knowledge Discovery and Data Mining

- [C1] **Conditional Graph Information Bottleneck for Molecular Relational Learning**  
 Namkyeong Lee, Dongmin Hyun, Gyoung S Na, **Sungwon Kim**, Junseok Lee, Chanyoung Park  
**ICML 2023** - International Conference on Machine Learning

#### JOURNALS

- [J1] **Deep Single-cell RNA-seq Data Clustering with Graph Prototypical Contrastive Learning**  
 Junseok Lee, **Sungwon Kim**, Dongmin Hyun, Namkyeong Lee, Yejin Kim, Chanyoung Park  
**Bioinformatics 2023** (SCI)

#### WORKSHOPS

- [W4] **Capturing Functional Context of Genetic Pathways through Hyperedge Disentanglement**  
 Yoonho Lee, Junseok Lee, Sangwoo Seo, Sungwon Kim, Yeongmin Kim, Chanyoung Park  
**ICLR 2025** - Workshop on Machine Learning for Genomics Explorations (MLGenX)
- [W3] **Subgraph Federated Learning for Local Generalization**  
**Sungwon Kim**, Yoonho Lee, Yunhak Oh, Namkyeong Lee, Sukwon Yun, Junseok Lee, Sein Kim, Carl Yang, Chanyoung Park  
**KDD 2024 (Best Paper Award)** - Workshop on Federated Learning for Data Mining and Graph Analytics
- [W2] **Interpretable Graph Model with Prototype-Based Graph Information Bottleneck**  
 Sangwoo Seo, **Sungwon Kim**, Chanyoung Park  
**KDD 2024 (Best Paper Award)** - Workshop on Human-Interpretable AI
- [W1] **Deep single-cell RNA-seq data clustering with graph prototypical contrastive learning**  
 Junseok Lee, **Sungwon Kim**, Dongmin Hyun, Namkyeong Lee, Yejin Kim, Chanyoung Park  
**ICML 2023** - Workshop on Computational Biology

#### PROJECTS

- **3D Geometry-Based Graph Neural Networks for Engineering Simulation**, LG Electronics 2025 –
- **3D Geometry-Based Graph Neural Networks for Injection Molding**, LG Electronics 2024
- **Translating Korean Legal Case's Sentences into Common Terms**, AISoftKorea 2021– 2022  
 Best award project at Seoul R&D research center (2021)
- **Sentence Similarity Model for Korean Legal Sentences**, AISoftKorea 2020  
 Best award project at Seoul R&D research center (2020)
- **Big Data Analysis of Color Cognition in Older Adults and Disabled Children**, AISoftKorea 2017  
 Development of Color Cognitive Test Kit and Multivariate Regression Analysis

#### HONORS & AWARDS

- **Best Paper Award** 2024  
 KDD 2024 -Workshop on Federated Learning for Data Mining and Graph Analytics (FedKDD), Barcelona, Spain
- **Best Paper Award** 2024  
 KDD 2024 -Workshop on Human-Interpretable AI, Barcelona, Spain
- **30th Samsung Humantech Paper Award** 2024  
 Gold Prize
- **Seoul Renovation Challenge**, Seoul Business Agency 2020  
 Awarded for the best team out of 444 participants [\[news\]](#)[\[news\]](#)  
 Systems and methods for providing quantified AI answering services for legal questions
- **National University Rowing Conference**, Korean Rowing Association 2015  
 First place, Crew of Korea University Rowing Team [\[YouTube\]](#)

#### PROFESSIONAL SERVICES

- Conference Reviewer/Program Committee**
- International Conference on Learning Representations (ICLR) 2025 – 2026
  - The Web Conference (WWW) 2026
  - Conference on Neural Information Processing Systems (NeurIPS) 2024 – 2025
  - International Conference on Machine Learning (ICML) 2025
  - Conference on Information and Knowledge Management (CIKM) - Short/Applied Research 2025
- Journal Reviewer**
- IEEE Transactions on Network Science and Engineering (TSNE) 2025
  - IEEE Transactions on Neural Networks and Learning Systems (TNNLS) 2024
  - IEEE Transactions on Cognitive and Developmental Systems (TCDS) 2024

<b>TEACHING EXPERIENCE</b>	▪ <b>AI Specialist Course</b> , Samsung Electronics Teaching Assistant	2024
	▪ <b>AI Specialist Course</b> , Samsung Electronics Teaching Assistant	2023
	▪ <b>DS503: Machine Learning for Data Science</b> , KAIST Teaching Assistant	2023
	▪ <b>AI Business Transformation Program</b> , KAIST Researcher	2022
	▪ <b>IE343: Statistical Machine Learning</b> , KAIST Teaching Assistant	2022
<b>TALKS AND SEMINARS</b>	▪ <b>Top Conference Session</b> , Korea Computer Congress (KCC) Subgraph Federated Learning for Local Generalization	2025
	▪ <b>Top Conference Session</b> , Korea Software Congress (KSC) Task-Equivariant Graph Few-shot Learning	2023
<b>REFERENCES</b>	▪ <b>Prof. Chanyoung Park</b> , Assistant Professor, KAIST Email: cy.park@kaist.ac.kr	

[CV compiled on 2025-10-12]