# Sungwon Kim

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**RESEARCH INTEREST**

**Graph Neural Network**

- Learning-based Simulation, Federated Learning, 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 via GNN
  - Adviser: Prof. Chanyoung Park
- M.S. in Graduate School of Data Science — Feb 2022 – Feb 2024
  - Research Interest: Graph Few-shot Learning, Graph 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**

[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] **DSLR: Diversity Enhancement and Structure Learning for Rehearsal-based Graph Continual Learning**
Seungyoon 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, Seungyoon 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**

[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** (Oral, 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** (Oral, 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
  Top award, Crew of Korea University Rowing Team

**PROFESSIONAL SERVICES**

**Conference Reviews**

- International Conference on Machine Learning (ICML) 2025
- International Conference on Learning Representations (ICLR) 2025
- Conference on Neural Information Processing Systems (NeurIPS) 2024

**Journal Reviews**

- IEEE Transactions on Neural Networks and Learning Systems (TNNLS) 2024
- IEEE Transactions on Cognitive and Developmental Systems (TCDS) 2024

**TEACHING EXPERIENCE**

- **AI Specialist Course**, Samsung Electronics 2024
  Teaching Assistant
- **AI Specialist Course**, Samsung Electronics 2023
  Teaching Assistant
- **DS503: Machine Learning for Data Science**, KAIST 2023
  Teaching Assistant
- **AI Business Transformation Program**, KAIST 2022
  Researcher
- **IE343: Statistical Machine Learning**, KAIST 2022
  Teaching Assistant

**TALKS AND SEMINARS**

- **Top Conference Session**, Korea Software Congress (KSC) 2023
  Task-Equivariant Graph Few-shot Learning

**REFERENCES**

- **Prof. Chanyoung Park**, Assistant Professor, KAIST
  Email: cy.park@kaist.ac.kr

[*CV compiled on 2025-02-11*]