

GEON LEE

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RESEARCH INTERESTS

Data Mining, Graph Neural Networks, Recommender Systems, Time Series Analysis, and More

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

M.S. & Ph.D. in Artificial Intelligence

Advisor: Kijung Shin

Seoul, South Korea

Sep. 2020 –

Sungkyunkwan University (SKKU)

B.S. in Computer Science and Engineering

GPA: 4.41/4.50; C.S.: 4.45/4.50 (Ranked 1st in the College of CSE)

Suwon, South Korea

Mar. 2016 – Aug. 2019

WORK EXPERIENCE

Snap Research

Research Intern

Mentors: Liam Collins, Clark Ju, Bhuvesh Kumar, Tong Zhao / Manager: Neil Shah

Bellevue, WA, USA

April 2025 – June 2025

NEC Labs America

Research Intern

Mentor: Wenchao Yu / Manager: Haifeng Chen

Princeton, NJ, USA

May 2023 – Aug. 2023

Amazon

Applied Scientist Intern

Mentor: Zhonghao Luo / Manager: Tao Ye

San Francisco, CA, USA

Sep. 2022 – Dec. 2022

AWARDS AND HONORS

Received the **Best Paper Award at ICDM 2025**

Dec. 2025

Received the **Best Survey Paper Award at PAKDD 2025**

June 2025

Selected as the **Outstanding Reviewer at KDD 2025**

Dec. 2024

Received the **KAIST Outstanding Paper Award**

Nov. 2024

Selected as the **Best Short Paper Candidates at RecSys 2024**

Oct. 2024

Selected as the **One of the Best-Ranked Papers at ICDM 2021**

Dec. 2021

Received **Sungkyunkwan Presidential Award**

Aug. 2019

Received **Sungkyunkwan Software Scholarship** (Full tuition scholarship)

2016 – 2019

TUTORIALS

[1] Mining of Real-World Hypergraphs: Patterns, Tools, and Generators

Geon Lee, Jaemin Yoo, and Kijung Shin

KDD 2023 & WWW 2023 & ICDM 2022 & CIKM 2022

PUBLICATIONS

- [1] Sequential Data Augmentation for Generative Recommendation
Geon Lee, Bhuvesh Kumar, Mingxuan Ju, Tong Zhao, Kijung Shin, Neil Shah, and Liam Collins
WSDM 2026
- [2] RDB2G-Bench: A Comprehensive Benchmark for Automatic Graph Modeling of Relational Databases
Dongwon Choi, Sunwoo Kim, Juyeon Kim, Kyungho Kim, Geon Lee, Shinhwan Kang, Myunghwan Kim, and Kijung Shin
NeurIPS 2025 (Dataset & Benchmark)
- [3] TimeXL: Explainable Multi-Modal Time Series Prediction with LLM-in-the-Loop
Yushan Jiang, Wenchao Yu, Geon Lee, Dongjin Song, Kijung Shin, Wei Cheng, Yanchi Liu, and Haifeng Chen
NeurIPS 2025
- [4] Attributed Hypergraph Generation with Realistic Interplay Between Structure and Attributes
Jaewan Chun, Seokbum Yoon, Minyoung Choe, Geon Lee, and Kijung Shin
ICDM 2025
Received the Best Paper Award at ICDM 2025
- [5] Identifying Group Anchors in Real-World Group Interactions Under Label Scarcity
Fanchen Bu, Geon Lee, Minyoung Choe, and Kijung Shin
ICDM 2025
- [6] A Self-Supervised Mixture-of-Experts Framework for Multi-behavior Recommendation
Kyungho Kim, Sunwoo Kim, Geon Lee, and Kijung Shin
CIKM 2025
- [7] Revisiting LightGCN: Unexpected Inflexibility, Inconsistency, and
A Remedy Towards Improved Recommendation
Geon Lee, Kyungho Kim, Fanchen Bu, Langzhang Liang, and Kijung Shin
Transactions on Recommender Systems (SCIE Journal, 2025)
- [8] SkySearch: Satellite Video Search at Scale
Minyoung Choe*, Geon Lee*, Changhun Han*, Suji Kim, Woong Hu, Hyebeen Hwang, Park Geun-seok, Byeongyeon Kim, Hyesook Lee, Ha-Myung Park, Kijung Shin (* equal contribution)
KDD 2025 (Applied Data Science)
- [9] KGMEL: Knowledge Graph-Enhanced Multimodal Entity Linking
Juyeon Kim, Geon Lee, Taeuk Kim, and Kijung Shin
SIGIR 2025 (Short Paper)
- [10] MARIOH: Multiplicity-Aware Hypergraph Reconstruction
Kyuhan Lee, Geon Lee, and Kijung Shin
ICDE 2025
- [11] A Survey on Hypergraph Mining: Patterns, Tools, and Generators
Geon Lee*, Fanchen Bu*, Tina Eliassi-Rad, and Kijung Shin (* equal contribution)
ACM Computing Surveys (SCI Journal, 2025)
- [12] Multi-Behavior Recommender Systems: A Survey
Kyungho Kim, Sunwoo Kim, Geon Lee, Jinhong Jung, and Kijung Shin
PAKDD 2025 (Survey Paper)
Received the Best Survey Paper Award at PAKDD 2025

- [13] Beyond Neighbors: Distance-Generalized Graphlets for Enhanced Graph Characterization
 Yeongho Kim, Yuyeong Kim, Geon Lee, and Kijung Shin
WWW 2025
- [14] TimeCAP: Learning to Contextualize, Augment, and Predict Time Series Events with Large Language Model Agents
Geon Lee, Wenchao Yu, Kijung Shin, Wei Cheng, and Haifeng Chen
AAAI 2025
- [15] Resource2Box: Learning to Rank Resources in Distributed Search Using Box Embedding
 Ulugbek Ergashev, Geon Lee, Kijung Shin, Eduard Dragut, and Weiyi Meng
ICDM 2024
- [16] Revisiting LightGCN: Unexpected Inflexibility, Inconsistency, and A Remedy Towards Improved Recommendation
Geon Lee, Kyungho Kim, and Kijung Shin
RecSys 2024 (Short Paper)
Selected as One of the Best Short Paper Candidates at RecSys 2024
- [17] Post-Training Embedding Enhancement for Long-Tail Recommendation
Geon Lee, Kyungho Kim, and Kijung Shin
CIKM 2024 (Short Paper)
- [18] Towards Better Utilization of Multiple Views for Bundle Recommendation
 Kyungho Kim, Sunwoo Kim, Geon Lee, and Kijung Shin
CIKM 2024 (Short Paper)
- [19] Representative and Back-in-Time Sampling from Real-world Hypergraphs
 Minyoung Choe, Jaemin Yoo, Geon Lee, Woonsung Baek, U Kang, and Kijung Shin
Transaction on Knowledge Discovery from Data (SCIE Journal, 2024)
- [20] VilLain: Self-Supervised Learning on Homogeneous Hypergraphs without Features via Virtual Label Propagation
Geon Lee, Soo Yong Lee, and Kijung Shin
WWW 2024
- [21] Hypergraph Motifs and Their Extensions Beyond Binary
Geon Lee*, Seokbum Yoon*, Jihoon Ko, Hyunju Kim, and Kijung Shin (* equal contribution)
The VLDB Journal (SCI Journal, 2023)
- [22] Random Walk with Restart on Hypergraphs:
 Fast Computation and an Application to Anomaly Detection
 Jaewan Chun, Geon Lee, Kijung Shin, and Jinhong Jung
Data Mining and Knowledge Discovery (SCI Journal, 2023)
- [23] Hypercore Decomposition for Non-Fragile Hyperedges:
 Concepts, Algorithms, Observations, and Applications
 Fanchen Bu, Geon Lee, and Kijung Shin
Data Mining and Knowledge Discovery (SCI Journal, 2023)
- [24] Temporal Hypergraph Motifs
Geon Lee and Kijung Shin
Knowledge and Information Systems (SCIE Journal, 2023)
- [25] Set2Box: Similarity Preserving Representation Learning for Sets
Geon Lee, Chanyoung Park, and Kijung Shin
ICDM 2022

- [26] HashNWalk: Hash and Random Walk Based Anomaly Detection in Hyperedge Streams
Geon Lee, Minyoung Choe, and Kijung Shin
IJCAI 2022
- [27] MiDaS: Representative Sampling from Real-World Hypergraphs
Minyoung Choe, Jaemin Yoo, Geon Lee, Woonsung Baek, U Kang, and Kijung Shin
WWW 2022
- [28] Simple Epidemic Models with Segmentation Can Be Better than Complex Ones
Geon Lee, Se-eun Yoon, and Kijung Shin
PLOS ONE (SCIE Journal, 2022)
Oral presentation at epiDAMIK workshop in KDD 2021
- [29] THyMe+: Temporal Hypergraph Motifs and Fast Algorithms for Exact Counting
Geon Lee and Kijung Shin
ICDM 2021
Selected as One of the Best-Ranked Papers at ICDM 2021
- [30] How Do Hyperedges Overlap in Real-World Hypergraphs? - Patterns, Measures, and Generators
Geon Lee*, Minyoung Choe*, and Kijung Shin (* equal contribution)
WWW 2021
- [31] Hypergraph Motifs: Concepts, Algorithms, and Discoveries
Geon Lee, Jihoon Ko, and Kijung Shin
VLDB 2020
- [32] MEGA: Multi-View Semi-Supervised Clustering of Hypergraphs
Joyce Jiyoung Whang, Rundong Du, Sangwon Jung, Geon Lee, Barry Drake, Qingqing Liu, Seonggoo Kang, and Haesun Park
VLDB 2020
- [33] Hyperlink Classification via Structured Graph Embedding
Geon Lee, Seonggoo Kang, and Joyce Jiyoung Whang
SIGIR 2019 (Short Paper)

ACADEMIC SERVICES

Program Committee/Conference Reviewer

- AAAI Conference on Artificial Intelligence (AAAI) 2024 - 2026
- The Web Conference (WWW) 2024 - 2025
- Conference on Neural Information Processing Systems (NeurIPS) 2024 - 2025
- ACM Conference on Knowledge Discovery and Data Mining (KDD) 2023 - 2026
- ACM International Conference on Information and Knowledge Management (CIKM) 2022 - 2025
- Learning on Graphs Conference (LoG) 2022 - 2024
- The ACM Conference on Recommender Systems (RecSys) 2025
- International Conference on Learning Representations (ICLR) 2025
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2025
- International Conference on Machine Learning (ICML) 2025
- Asian Conference on Machine Learning (ACML) 2025
- SIAM International Conference on Data Mining (SDM) 2024

Journal Reviewer

- Information Sciences 2024 - 2025

- PLOS ONE 2024 - 2025
- Data Mining and Knowledge Discovery 2024 - 2025
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS) 2023 - 2025
- The VLDB Journal 2023 - 2025
- IEEE Transactions on Knowledge and Data Engineering (TKDE) 2023 - 2024
- ACM Transactions on Information Systems (TOIS) 2025
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2025
- Information Processing and Management 2025
- The Journal of Supercomputing 2025
- Machine Learning 2025
- IEEE Transactions on Network Science and Engineering (TNSE) 2024
- Big Data Research 2024

Session Chair

- ACM International Conference on Information and Knowledge Management (CIKM) 2024

PROJECTS

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| SW Star Lab | Feb. 2025 – |
| AI-based Weather Forecast Support Development | July 2021 – Dec. 2024 |
| COVID-19 Task Force | Mar. 2020 – Sep. 2020 |

TEACHING

Teaching Assistant

- KAIST AI506 Data Mining and Search Spring 2021, 2023
- KAIST AI607 Graph Mining and Social Network Analysis Fall 2020, 2021, 2022, 2023
- KAIST AI617 Machine Learning for Robotics Spring 2022
- SKKU CSE3036 Seminar in Computer Engineering Fall 2019

Tutorial Tutor

- Mining of Real-World Hypergraphs: Patterns, Tools, and Generators
CIKM 2022, ICDM 2022, WWW 2023, KDD 2023