

# GEON LEE

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## RESEARCH INTERESTS

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

## EDUCATION

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**Korea Advanced Institute of Science and Technology (KAIST)**

Seoul, South Korea

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

Sep. 2020 –

Advisor: Kijung Shin

**Sungkyunkwan University (SKKU)**

Suwon, South Korea

B.S. in Computer Science and Engineering

Mar. 2016 – Aug. 2019

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

## WORK EXPERIENCE

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**NEC Labs America**

Princeton, NJ, USA

Research Intern

May 2023 – Aug. 2023

Mentor: Wenchao Yu / Manager: Haifeng Chen

**Amazon**

San Francisco, CA, USA

Applied Scientist Intern

Sep. 2022 – Dec. 2022

Mentor: Zhonghao Luo / Manager: Tao Ye

## AWARDS AND HONORS

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**Outstanding Reviewer (Top 10%) of KDD 2025**

Dec. 2024

**KAIST Outstanding Paper Award**

Nov. 2024

**Best Short Paper Candidates of RecSys 2024**

Oct. 2024

**One of the Best-Ranked Papers of ICDM 2021**

Dec. 2021

**Sungkyunkwan Presidential Award**

Aug. 2019

**Dean's List**

2016 – 2019

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

2016 – 2019

## TUTORIALS

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- [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

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- [1] 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)

- [2] Multi-Behavior Recommender Systems: A Survey

Kyungho Kim, Sunwoo Kim, Geon Lee, Jinhong Jung, and Kijung Shin

**PAKDD 2025** (Survey Paper)

- [3] Beyond Neighbors: Distance-Generalized Graphlets for Enhanced Graph Characterization  
Yeongho Kim, Yuyeong Kim, Geon Lee, and Kijung Shin  
**WWW 2025**
- [4] 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**
- [5] Resource2Box: Learning to Rank Resources in Distributed Search Using Box Embedding  
Ulugbek Ergashev, Geon Lee, Kijung Shin, Eduard Dragut, and Wei Meng  
**ICDM 2024**
- [6] 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 of RecSys 2024*
- [7] Post-Training Embedding Enhancement for Long-Tail Recommendation  
Geon Lee, Kyungho Kim, and Kijung Shin  
**CIKM 2024** (Short Paper)
- [8] Towards Better Utilization of Multiple Views for Bundle Recommendation  
Kyungho Kim, Sunwoo Kim, Geon Lee, and Kijung Shin  
**CIKM 2024** (Short Paper)
- [9] 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)
- [10] VilLain: Self-Supervised Learning on Homogeneous Hypergraphs without Features  
via Virtual Label Propagation  
Geon Lee, Soo Yong Lee, and Kijung Shin  
**WWW 2024**
- [11] 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)
- [12] 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)
- [13] 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)
- [14] Temporal Hypergraph Motifs  
Geon Lee and Kijung Shin  
**Knowledge and Information Systems** (SCIE Journal, 2023)
- [15] Set2Box: Similarity Preserving Representation Learning for Sets  
Geon Lee, Chanyoung Park, and Kijung Shin  
**ICDM 2022**

- [16] HashNWalk: Hash and Random Walk Based Anomaly Detection in Hyperedge Streams  
Geon Lee, Minyoung Choe, and Kijung Shin  
**IJCAI 2022**
- [17] MiDaS: Representative Sampling from Real-World Hypergraphs  
Minyoung Choe, Jaemin Yoo, Geon Lee, Woonsung Baek, U Kang, and Kijung Shin  
**WWW 2022**
- [18] 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*
- [19] 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 of ICDM 2021*
- [20] How Do Hyperedges Overlap in Real-World Hypergraphs? - Patterns, Measures, and Generators  
Geon Lee\*, Minyoung Choe\*, and Kijung Shin (\* equal contribution)  
**WWW 2021**
- [21] Hypergraph Motifs: Concepts, Algorithms, and Discoveries  
Geon Lee, Jihoon Ko, and Kijung Shin  
**VLDB 2020**
- [22] 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**
- [23] Hyperlink Classification via Structured Graph Embedding  
Geon Lee, Seonggoo Kang, and Joyce Jiyoung Whang  
**SIGIR 2019** (Short Paper)

## ACADEMIC SERVICES

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### Program Committee/Conference Reviewer

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

### Journal Reviewer

- IEEE Transactions on Neural Networks and Learning Systems (TNNLS) 2023 - 2024
- IEEE Transactions on Knowledge and Data Engineering (TKDE) 2023 - 2024
- The VLDB Journal 2023 - 2024

- Information Sciences 2024 - 2025
- PLOS ONE 2024 - 2025
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2025
- Information Processing and Management 2025
- IEEE Transactions on Network Science and Engineering (TNSE) 2024
- Data Mining and Knowledge Discovery 2024
- Big Data Research 2024

#### **Session Chair**

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

#### **PROJECTS**

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**AI-based Weather Forecast Support Development  
COVID-19 Task Force**

July 2021 –  
Mar. 2020 – Sep. 2020

#### **TEACHING**

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##### **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