Kibum Kim

PH.D STUDENT

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Experience with Computer Vision/LLM/Recsys

Computer Vision (Scene Understanding)

- I have primarily conducted research in scene understanding within computer vision [3][5][7][8]. Specifically, I have been researching how to enhance compositional reasoning within a scene, which predicts the visual relationships between two objects in an image. Having primarily worked on visual relationship detection in the image domain, I recently expanded my research to the video domain [10] (This is currently under submission for ICLR'25). In other words, within the field of perception, I have been researching the prediction of visual relationships beyond merely capturing image objects, which allows for more fine-grained scene recognition.

LLM

- In *scene understanding* (i.e., scene graph generation task) within computer vision, I have experience in leveraging LLMs to jointly address long-tail challenges and improve data scalability. Specifically, I applied LLMs to generate a high-quality dataset, effectively addressing the issue of limited scene graph generation data. [7]
- Currently, I am working with open-source Large Language Models (e.g., LLaMA-3-8B) to develop a foundational model for personalization, specifically focusing on Multimodal Large Language Model-based recommender systems.

Recsys

- Recommender systems often face long-tailed challenges related to both users and items. Previously, I jointly addressed the long-tailed user and item challenges in sequential recommendation for the first time. [4]

Research Interest

Machine Learning/Deep Learning

RECOMMENDATION SYSTEM, SCENE UNDERSTANDING, GRAPH NEURAL NETWORKS

- With the advancement of machine learning, fundamental challenges continue to arise, compromising the model's generalizability. In this regard, my research aims to address the fundamental challenges to improve the generalization power of the model. The fundamental challenges of interest, but are not limited, are the following:
  - *Long-tailedness*: [2], [3], [4], [5], [7], [8], [10]
  - *Data Scarcity*: [7], [10]
  - *Adversarial Attacks*: [6], [9], [12]
- As fundamental challenges arise across various domains, my research areas are diverse and include the following:
  - *Recommender Systems*
  - *Image/Video Scene Understanding*
  - *Graph Neural Networks*

Education

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

PH.D IN INDUSTRIAL & SYSTEMS ENGINEERING — *Sep 2023 - Present*

- Research Interest: Recommender systems, Scene Understanding, Large Language Model
- Advisor: Prof. Chanyoung Park

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

M.S IN INDUSTRIAL & SYSTEMS ENGINEERING — *Aug 2021 - Jul 2023*

- Research Interest: Scene Understanding, Recommender systems, Graph Neural Network
- Advisor: Prof. Chanyoung Park

Hanyang University *Seoul, South Korea*

B.S. in Industrial Engineering *Mar 2016 - Jul 2021*

- GPA: 4.09/4.5
- Early Graduation
- The period includes two years of military service, required for all Korean men

Publications

Preprint

[12] Yeonjun In, Kanghoon Yoon, Sukwon Yun, Kibum Kim, Sungchul Kim, Chanyoung Park. Noise Robust Graph Learning under Feature-Dependent Graph-Noise.

[11] Kanghoon Yoon, Kibum Kim, Jaehyeong Jeon, Yeonjun In, Donghyun Kim, Chanyoung Park. ReTAG: Retrieval-Augmented Scene Graph Generation via Multi-Prototype Learning.

[10] Kibum Kim, Kanghoon Yoon, Yeonjun In, Jaehyeong Jeon , Jinyoung Moon, Donghyun Kim, Chanyoung Park. Weakly supervised Video Scene Graph Generation with Natural Language Supervision.

Conference

[9] (**CIKM 2024**) Kanghoon Yoon, Yeonjun In, Namkyeong Lee, Kibum Kim, Chanyoung Park. Debiased Graph Poisoning Attack via Contrastive Surrogate Objective. ACM International Conference on Information and Knowledge Management.[Paper] [Code]

[8] (**ECCV 2024**) Jaehyeong Jeon, Kibum Kim, Kanghoon Yoon, Chanyoung Park. Semantic Diversity-aware Prototye-based Learning for Unbiased Scene Graph Generation. The 18th European Conference on Computer Vision ECCV 2024. [Paper] [Code]

[7] (**CVPR 2024**) Kibum Kim, Kanghoon Yoon, Jaehyeong Jeon, Yeonjun In, Jinyoung Moon, Donghyun Kim, Chanyoung Park. LLM4SGG: Large Language Model for Weakly Supervised Scene Graph Generation. [Paper] [Code]

[6] (**WWW 2024 (Oral)**) Yeonjun In, Kanghoon Yoon, Kibum Kim, Kijung Shin, Chanyoung Park. Self-guided Robust Graph Structure Refinement. The 2024 ACM Web Conference. [Paper] [Code]

[5] (**ICLR 2024**) Kibum Kim*, Kanghoon Yoon*, Yeonjun In, Jinyoung Moon, Donghyun Kim, Chanyoung Park. Adaptive Self-training Framework for Fine-grained Scene Graph Generation. The Twelfth International Conference on Learning Representations. [Paper] [Code]

[4] (**SIGIR 2023**) Kibum Kim, Dongmin Hyun, Sukwon Yun, Chanyoung Park. MELT: Mutual Enhancement of Long-Tailed User and Item for Sequential Recommendation. The 46th International ACM SIGIR Conference on Research and Development in Information Retrieval. [Paper] [Code]

[3] (**AAAI 2023**) Kanghoon Yoon*, Kibum Kim*, Jinyoung Moon, Chanyoung Park. Unbiased Heterogeneous Scene Graph Generation with Relation-aware Message Passing Neural Network. Proceedings of the AAAI Conference on Artificial Intelligence 2023. [Paper] [Code]

[2] (**CIKM 2022**) Sukwon Yun, Kibum Kim, Kanghoon Yoon, Chanyoung Park. LTE4G: Long-Tail Experts for Graph Neural Networks. Proceedings of the 31st ACM International Conference on Information & Knowledge Management. [Paper] [Code]

Journal

[1] (**TNNLS 2024**) Kanghoon Yoon, Kibum Kim, Jinyoung Moon, Chanyoung Park. Generating Fine-grained Scene Graph via Heterogeneous Graph Learning. IEEE Transactions on Neural Networks and Learning Systems (TNNLS).

Projects

2024.06-Present **NAVER·Intel·KAIST (NIK) AI Collaboration Project for building a new AI ecosystem**
Collaboration with NAVER & Intel

2022.06-Present **AI Development for reasoning, extraction, understanding of common-sense**
Collaboration with **I**nstitute for **I**nformation & communications **T**echnology **P**lanning & evaluation (IITP)

2021.06-Present **Visual Intelligence Technique Development**
Collaboration with **E**lectronics and **T**elecommunications **R**esearch **I**nstitute (ETRI)

2020.12-2021.06 **Recommending Financial Product based on Graph Embeddings**
Collaboration with Hana Bank

Awards & Scholarship

2022 **Poster Competition Excellence Award**
Awarded at Industrial/Social Problem Solving Session held by Department of ISysE, KAIST

2022 **Hanyang Academic Achievement Award**
Awarded within the top 3% among the College of Engineering, Hanyang Univ.

2020 **Hanyang Brain Scholarship**
Scholarship for excellent top 5% grade in Industrial Engineering department, Hanyang Univ.

2020 **Outstanding Learning Activities Scholarship**
Outstanding learning activities in communities held by University Innovation Support

2017 **Hanyang Brain Scholarship**
Scholarship for excellent top 5% grade in Industrial Engineering department, Hanyang Univ.

Professional Services

Conference Review

- 2025 - The International Conference on Learning Representations (ICLR)
- 2025 - AAAI Conference on Artificial Intelligence (AAAI)
- 2024 - AAAI Conference on Artificial Intelligence (AAAI)
- 2024 - Conference on Information and Knowledge Management (CIKM)

Journal Review

- 2024 - IEEE Transactions on Neural Networks and Learning Systems (TNNLS) X2
- 2024 - IEEE Transactions on Knowledge and Data Engineering (TKDE)
- 2023 - IEEE Transactions on Knowledge and Data Engineering (TKDE)
- 2023 - IEEE Transactions on Neural Networks and Learning Systems (TNNLS)

Teaching Experience

Spring 2022 **KSE527: Machine Learning for Knowledge Service**
Teaching Assistant

Fall 2022 **KSE801: Recommender System and Graph Machine Learning**
Teaching Assistant

Talks & Seminars

Jun 2023 **MELT: Mutual Enhancement of Long-Tailed User and Item for Sequential Recommendation**
Top Conference Session of Korea Computer Congress (KCC) 2023

Activities

2021.12-2022.02 **Research intern in Data Science & Artificial Intelligence Lab (DSAIL)**
Implementing key papers on Graph Neural Networks and Recommender Systems (link)

2018.06-2018.07 **Short-term Language Study Program in China**
Cultural exchange activities at Changchun University

References

Prof. Chanyoung Park, Assistant professor, KAIST
Email: cy.park@kaist.ac.kr