

Sukwon Yun

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RESEARCH INTEREST

Graph Neural Networks and their applications in biomedical domain (AI4Science)

- Addressing the inductive bias of Graph Neural Networks in real-world scenarios, with their application in the field of Medical and Computational Biology, particularly scRNA-seq and Tumor biology
- **Keywords:** Long-Tail Problem, Missing Features, Heterophily, Dropout, Tissue Phenotyping

EDUCATION

Korea Advanced Institute of Technology (KAIST), Daejeon, South Korea Aug 2021 – Aug 2023

- M.S. in Industrial & Systems Engineering
 - Research Interest: Graph Neural Networks with their applications
 - Advisor: [Prof. Chanyoung Park](#)

Hanyang University, Seoul, South Korea

Mar 2015 – Aug 2021

- B.S. in Industrial Engineering
 - *Summa Cum Laude*, Period includes two years of military service

PUBLICATIONS (*: Equal contribution)

CONFERENCES

- [C5] DEGNN: Dual Experts Graph Neural Network Handling Both Edge and Node Feature Noise
Tai Hasegawa, **Sukwon Yun**, Xin Liu, Yin Jun Phua, Tsuyoshi Murata
The Pacific-Asia Conference on Knowledge Discovery and Data Mining (**PAKDD 2024**)
- [C4] MUSE: Music Recommender System with Shuffle Play Recommendation Enhancement
Yunhak Oh*, **Sukwon Yun***, Dongmin Hyun, Sein Kim, Chanyoung Park
ACM International Conference on Information and Knowledge Management (**CIKM 2023**)
- [C3] S-Mixup: Structural Mixup for Graph Neural Networks
Junghun Kim*, **Sukwon Yun***, Chanyoung Park
ACM International Conference on Information and Knowledge Management (**CIKM Short 2023**)
- [C2] MELT: Mutual Enhancement of Long-Tailed User and Item for Sequential Recommendation
Kibum Kim, Dongmin Hyun, **Sukwon Yun**, Chanyoung Park
ACM SIGIR Conference on Research and Development in Information Retrieval (**SIGIR 2023**)
- [C1] LTE4G: Long-Tail Experts for Graph Neural Networks
Sukwon Yun, Kibum Kim, Kanghoon Yoon, Chanyoung Park
ACM International Conference on Information and Knowledge Management (**CIKM 2022**)

WORKSHOPS

- [W1] Single-cell RNA-seq data imputation using Feature Propagation
Sukwon Yun*, Junseok Lee*, Chanyoung Park
ICML Workshop on Computational Biology (**ICML WCB 2023 Best Paper Award**)

IN SUBMISSION (*: Equal contribution)

CONFERENCES

- [S3] Enhancing Single-Cell Multi-Modal Multi-Task Learning via Sparse MoE
Sukwon Yun*, Jie Peng*, Namkyeong Lee, Yanyong Zhang, Chanyoung Park, Tianlong Chen
Under Review
- [S2] Multiplexed Immunofluorescence Image Analysis through an Efficient Multiplex Network
Sukwon Yun, Jie Peng, Chanyoung Park, Tianlong Chen
Under Review
- [S1] Toward Generalizability of Graph-based Imputation on Bio-Medical Missing Data
Sukwon Yun, Yunhak Oh, Junseok Lee, Xin Liu, Tsuyoshi Murata, Dongmin Hyun, Sein Kim, Tianlong Chen, Chanyoung Park
Under Review

JOURNAL

- [S4] Single-cell RNA sequencing data imputation using bi-level feature propagation
Junseok Lee*, **Sukwon Yun***, Yeongmin Kim, Tianlong Chen, Manolis Kellis, Chanyoung Park
Under Review

RESEARCH EXPERIENCES	Remote Research Internship Aug 2023 – Present <ul style="list-style-type: none"> Research Intern in UNITES Lab. <ul style="list-style-type: none"> Mentor: Dr. Tianlong Chen (Postdoctoral Researcher at CSAIL@MIT and Incoming Assistant Professor at UNC) Explored cellular heterogeneity in mpIF image using multi-layer scalable GNNs, submitted to CVPR 2024 Explored the generalizability of graph-based imputation in the bio-medical domain, submitted to ICLR 2024 Aimed at feature propagation in scRNA-seq, collaborating with Prof. Manolis Kellis, submitted to Nature Methods
	Tokyo Institute of Technology (Tokyo Tech), Tokyo, Japan Oct 2022 – Feb 2023 <ul style="list-style-type: none"> Visiting Researcher in Murata Lab. <ul style="list-style-type: none"> Host: Prof. Tsuyoshi Murata Explored weaknesses of structured-based and GNN-based methods in graphs with missing features Proposed supervised contrastive learning that incorporates pseudo-labels in graph domains
	Korea Advanced Institute of Technology (KAIST), Daejeon, South Korea Dec 2020 – Feb 2021 <ul style="list-style-type: none"> Research Intern in Data Science & Artificial Intelligence Lab. (DSAIL) <ul style="list-style-type: none"> Mentor: Prof. Chanyoung Park Explored the theoretical basis and practical implementation of GNNs such as GCN and GAT (link)
	Hanyang University, Seoul, South Korea Sep 2020 – Aug 2021 <ul style="list-style-type: none"> Student Researcher in Intelligent Data Systems Lab. (IDSL) <ul style="list-style-type: none"> Mentor: Prof. Kichun Lee Proposed an advanced version of Neural Graph Collaborative Filtering using a heterogeneous graph Implemented One-Class SVM on anomaly detection task using MNIST dataset
TEACHING EXPERIENCE	IE343: Statistical Machine Learning, KAIST Spring, 2022 <ul style="list-style-type: none"> Gave a tutorial and hosted Kaggle Competition (Course Project) as a Teaching Assistant <ul style="list-style-type: none"> Competition: Predicting a person's income using a demographic dataset under an imbalance situation
AWARDS & SCHOLARSHIPS	Best Paper Award 2023 <ul style="list-style-type: none"> ICML Workshop on Computational Biology, Honolulu, Hawai'i, USA
	Korea National Scholarship 2021 – 2023 <ul style="list-style-type: none"> Awarded by the Ministry of Science and ICT, South Korea
	Poster Competition Excellence Award 2022 <ul style="list-style-type: none"> Awarded at Industrial/Social Problem Solving Session held by Department of ISysE, KAIST
	SIGIR Student Travel Award 2022 <ul style="list-style-type: none"> ACM International Conference on Information and Knowledge Management, Georgia, USA
	Merit Based Scholarship 2021 <ul style="list-style-type: none"> Awarded by the Department of Industrial Engineering, Hanyang University
	Hanyang Academic Achievement Award 2021 <ul style="list-style-type: none"> Awarded within the top 3% among the College of Engineering, Hanyang University
	Certificate of Recognition 2018 <ul style="list-style-type: none"> Awarded when serving military service as an auxiliary police by Seoul Metropolitan Police
PROFESSIONAL SERVICES	Event Organizations <ul style="list-style-type: none"> Session Chair, Knowledge Representation 3, CIKM 2023, Birmingham, UK
	Conference Reviews <ul style="list-style-type: none"> International Conference on Machine Learning (ICML) 2024 The International Conference on Learning Representations (ICLR) 2024 Conference on Parsimony and Learning (CPAL) 2024 Conference on Neural Information Processing Systems (NeurIPS) 2023
PROJECTS	Recommending Financial Products based on Graph Embeddings Feb 2021 – Feb 2022 <ul style="list-style-type: none"> Collaboration with Hana Bank, South Korea <ul style="list-style-type: none"> Generated financial networks via Jaccard similarity from user's data and enhanced user representation via GNN
REFERENCES	
	<ul style="list-style-type: none"> Prof. Chanyoung Park, Assistant Professor, KAIST Email: cy.park@kaist.ac.kr
	<ul style="list-style-type: none"> Prof. Tsuyoshi Murata, Professor, Tokyo Tech Email: murata@c.titech.ac.jp
	<ul style="list-style-type: none"> Dr. Tianlong Chen, Incoming Assistant Professor, UNC Email: tianlong@mit.edu