

# Sukwon Yun

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## RESEARCH INTEREST

### AI for Science

- Addressing the inductive bias of AI (GNNs, LLMs) in real-world scenarios, with their application in the field of Computational Biology, particularly scRNA-seq and Tumor biology
- **Keywords:** Long-Tail Problem, Missing Features, Heterophily, Dropout, Tissue Phenotyping

## EDUCATION

**University of North Carolina at Chapel Hill**, Chapel Hill, NC, USA Aug 2024 –

- Ph.D. in Computer Science
  - Research Interest: AI4Science, Efficient ML
  - Advisor: [Prof. Tianlong Chen](#)

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

- M.S. in Industrial & Systems Engineering
  - Research Interest: Graph Neural Networks, Recommender Systems
  - 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

- [W2] Noise Robust Graph Learning under Feature-Dependent Graph-Noise  
Yeonjun In, Kanghoon Yoon, **Sukwon Yun**, Kibum Kim, Sungchul Kim, Chanyoung Park  
WWW 2024 Workshop on Data-centric Artificial Intelligence (**WWW DCAI 2024 Oral**)
- [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**)

### JOURNALS

- [J1] Single-cell RNA sequencing data imputation using bi-level feature propagation  
Junseok Lee\*, **Sukwon Yun\***, Yeongmin Kim, Tianlong Chen, Manolis Kellis, Chanyoung Park  
**Briefings in Bioinformatics** (2024)

## RESEARCH EXPERIENCES

**Remote Research Internship** Aug 2023 – Present

- Research Intern in UNITES Lab.
  - Mentor: [Dr. Tianlong Chen](#) (Postdoctoral Researcher at CSAIL@MIT and Incoming Assistant Professor at UNC)
  - Explored cellular heterogeneity in mIF image using multi-layer scalable GNNs, submitted to ECCV 2024
  - Explored the generalizability of graph-based imputation in the bio-medical domain, submitted to ICML 2024
  - Aimed at feature propagation in scRNA-seq, collaborating with Prof. Manolis Kellis, accepted by Brief. Bioinform.

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