

# Sukwon Yun

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## RESEARCH INTEREST

### AI for Science, Multi-Agent LLMs

- Addressing inductive bias of AI (LLMs, MoE, GNNs) with their application in Computational Biology

## EDUCATION

- University of North Carolina at Chapel Hill**, Chapel Hill, NC, USA Aug 2024 – Present
- Ph.D. in Computer Science (Advisor: [Prof. Tianlong Chen](#))
- Korea Advanced Institute of Technology (KAIST)**, Daejeon, South Korea Aug 2021 – Aug 2023
- M.S. in Industrial & Systems Engineering (Advisor: [Prof. Chanyoung Park](#))
- Hanyang University**, Seoul, South Korea Mar 2015 – Aug 2021
- B.S. in Industrial Engineering, *Summa Cum Laude*

## PUBLICATIONS (\*: Equal contribution)

### JOURNALS

- [J2] Single-cell epigenomics and transcriptomics reveal regulatory rewiring in Alzheimer’s disease across brain regions  
Zunpeng Liu\*, Shanshan Zhang\*, Benjamin T. James\*, Kyriaki Galani, Riley J. Mangan, Stuart Benjamin Fass, Chuqian Liang, Manoj M Wagle, Carles A. Boix, Yosuke Tanigawa, **Sukwon Yun**, Yena Sung, Xushen Xiong, Na Sun, Lei Hou, Martin Wohlwend, Mufan Qiu, Xikun Han, Lei Xiong, Efthalia Preka, Lei Huang, William F. Li, Li-Lun Ho, Amy Grayson, Julio Mantero, Alexey Kozlenkov, Hansruedi Mathys, Tianlong Chen, Stella Dracheva, David A. Bennett, Li-Huei Tsai, Manolis Kellis  
**Cell 2025**
- [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**

### CONFERENCES

- [C18] Oldie but Goodie: Re-illuminating Label Propagation on Graphs with Partially Observed Features  
**Sukwon Yun**, Xin Liu, Yunhak Oh, Junseok Lee, Tianlong Chen, Tsuyoshi Murata, Chanyoung Park  
**KDD 2025**
- [C17] Spatial Coordinates as a Cell Language: A Multi-Sentence Framework for Imaging Mass Cytometry Analysis  
Chi-Jane Chen\*, Yuhang Chen\*, **Sukwon Yun\***, Natalie Stanley, Tianlong Chen  
**ACL 2025 Findings**
- [C16] GRNFormer: A Biologically-Guided Framework for Integrating Gene Regulatory Networks into RNA Foundation Models  
Mufan Qiu, Xinyu Hu, Fengwei Zhan, **Sukwon Yun**, Jie Peng, Ruichen Zhang, Bhavya Kailkhura, Jiekun Yang, Tianlong Chen  
**ACL 2025 Findings**
- [C15] Agents Under Siege: Breaking Pragmatic Multi-Agent LLM Systems with Optimized Prompt Attacks  
Rana Shahroz, Zhen Tan, **Sukwon Yun**, Charles Fleming, Tianlong Chen  
**ACL 2025**
- [C14] I<sup>2</sup>MoE: Interpretable Multimodal Interaction-aware Mixture-of-Experts  
Jiayi Xin, **Sukwon Yun**, Jie Peng, Inyoung Choi, Jenna L. Ballard, Tianlong Chen, Qi Long  
**ICML 2025**
- [C13] Modalities Contribute Unequally: Enhancing Medical Multi-modal Learning through Adaptive Modality Token Re-balancing  
Jie Peng, Jenna L. Ballard, Mohan Zhang, **Sukwon Yun**, Jiayi Xin, Qi Long, Yanyong Zhang, Tianlong Chen  
**ICML 2025**

- [C12] Sparse MoE as a New Treatment: Addressing Forgetting, Fitting, Learning Issues in Multi-Modal Multi-Task Learning  
Jie Peng, **Sukwon Yun**, Kaixiong Zhou, Ruida Zhou, Thomas Hartvigsen, Yanyong Zhang, Zhangyang Wang, Tianlong Chen  
**CPAL 2025**
- [C11] Cut the Crap: An Economical Communication Pipeline for LLM-based Multi-Agent Systems  
Guibin Zhang, Yanwei Yue, Zhixun Li, **Sukwon Yun**, Guancheng Wan, Kun Wang, Dawei Cheng, Jeffrey Xu Yu, Tianlong Chen  
**ICLR 2025**
- [C10] PortLLM: Personalizing Evolving Large Language Models with Training-Free and Portable Model Patches  
Rana Muhammad Shahroz Khan, Pingzhi Li\*, **Sukwon Yun\***, Zhenyu Wang, Shahriar Nirjon, Chau-Wai Wong, Tianlong Chen  
**ICLR 2025**
- [C9] Subgraph Federated Learning for Local Generalization  
Sungwon Kim, Yoonho Lee, Yunhak Oh, Namkyeong Lee, **Sukwon Yun**, Junseok Lee, Sein Kim, Carl Yang, Chanyoung Park  
**ICLR 2025 Oral**
- [C8] Flex-MoE: Modeling Arbitrary Modality Combination via the Flexible Mixture-of-Experts  
**Sukwon Yun**, Inyoung Choi, Jie Peng, Yangfan Wu, Jingxuan Bao, Qiyiwen Zhang, Jiayi Xin, Qi Long, Tianlong Chen  
**NeurIPS 2024 Spotlight**
- [C7] DALK: Dynamic Co-Augmentation of LLMs and KG to answer Alzheimer’s Disease Questions with Scientific Literature  
Dawei Li, Shu Yang, Zhen Tan, Jae Young Baik, **Sukwon Yun**, Joseph Lee, Aaron Chacko, Bojian Hou, Duy Duong-Tran, Ying Ding, Huan Liu, Li Shen, Tianlong Chen  
**EMNLP 2024 Findings**
- [C6] Mew: Multiplexed Immunofluorescence Image Analysis through an Efficient Multiplex Network  
**Sukwon Yun**, Jie Peng, Alexandro Trevino, Chanyoung Park, Tianlong Chen  
**ECCV 2024**
- [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  
**PAKDD 2024**
- [C4] MUSE: Music Recommender System with Shuffle Play Recommendation Enhancement  
Yunhak Oh\*, **Sukwon Yun\***, Dongmin Hyun, Sein Kim, Chanyoung Park  
**CIKM 2023**
- [C3] S-Mixup: Structural Mixup for Graph Neural Networks  
Junghurn Kim\*, **Sukwon Yun\***, Chanyoung Park  
**CIKM 2023 Short**
- [C2] MELT: Mutual Enhancement of Long-Tailed User and Item for Sequential Recommendation  
Kibum Kim, Dongmin Hyun, **Sukwon Yun**, Chanyoung Park  
**SIGIR 2023**
- [C1] LTE4G: Long-Tail Experts for Graph Neural Networks  
**Sukwon Yun**, Kibum Kim, Kanghoon Yoon, Chanyoung Park  
**CIKM 2022**

#### WORKSHOPS

- [W5] Graph-of-Agents: A Graph-Based Framework for Multi-Agent LLM Collaboration  
**Sukwon Yun**, Jie Peng, Pingzhi Li, Wendong Fan, Jie Chen, James Zou, Guohao Li, Tianlong Chen  
**ICML MAS 2025**
- [W4] Generate, Then Retrieve: Addressing Missing Modalities in Multimodal Learning via Generative AI and MoE  
**Sukwon Yun\***, Jiayi Xin\*, Inyoung Choi, Jie Peng, Qi Long, Tianlong Chen  
**AAAI GenAI4Health 2025 Best Paper Award**

- [W3] Subgraph Federated Learning for Local Generalization  
Sungwon Kim, Yoonho Lee, Yunhak Oh, Namkyeong Lee, **Sukwon Yun**, Junseok Lee, Sein Kim, Carl Yang, Chanyoung Park  
**KDD FedKDD 2024 Best Paper Award**
- [W2] Noise Robust Graph Learning under Feature-Dependent Graph-Noise  
Yeonjun In, Kanghoon Yoon, **Sukwon Yun**, Kibum Kim, Sungchul Kim, Chanyoung Park  
**WWW DCAI 2024 Oral**
- [W1] Single-cell RNA-seq data imputation using Feature Propagation  
**Sukwon Yun\***, Junseok Lee\*, Chanyoung Park  
**ICML 2023 WCB Best Paper Award**

#### PREPRINT

- [P2] Symbolic Mixture-of-Experts: Adaptive Skill-based Routing for Heterogeneous Reasoning  
Justin Chih-Yao Chen\*, **Sukwon Yun\***, Elias Stengel-Eskin\*, Tianlong Chen, Mohit Bansal
- [P1] scMoE: single-cell Multi-Modal Multi-Task Learning via Sparse Mixture-of-Experts  
**Sukwon Yun\***, Jie Peng\*, Namkyeong Lee, Yanyong Zhang, Chanyoung Park, Zunpeng Liu, Tianlong Chen

#### RESEARCH EXPERIENCES

- Genentech**, South San Francisco, CA, USA May 2025 – Aug 2025
- Research Intern in Regev Lab.
  - Mentors: [Dr. Aviv Regev](#), [Dr. Russell Littman](#)
- Massachusetts Institute of Technology (MIT)**, Cambridge, MA Aug 2023 – Jul 2024
- Remote Research Intern in Kellis Lab.
  - Mentors: [Dr. Tianlong Chen](#), [Dr. Zunpeng Liu](#), [Dr. Leandro Z. Agudelo](#), [Dr. Lei Xiong](#)
- Tokyo Institute of Technology (Tokyo Tech)**, Tokyo, Japan Oct 2022 – Feb 2023
- Visiting Researcher in Murata Lab.
  - Host: [Prof. Tsuyoshi Murata](#)
- Korea Advanced Institute of Technology (KAIST)**, Daejeon, South Korea Dec 2020 – Feb 2021
- Research Intern in Data Science & Artificial Intelligence Lab. (DSAIL)
  - Mentor: [Prof. Chanyoung Park](#)
- Hanyang University**, Seoul, South Korea Sep 2020 – Aug 2021
- Student Researcher in Intelligent Data Systems Lab. (IDSL)
  - Mentor: [Prof. Kichun Lee](#)

#### TEACHING EXPERIENCE

- KAIST**
- IE343: Statistical Machine Learning Spring, 2022

#### AWARDS & SCHOLARSHIPS

- Best Paper Award** 2025
- AAAI Workshop on Large Language Models and Generative AI for Health, Philadelphia, PA, USA
- Best Paper Award** 2024
- KDD Workshop on Federated Learning for Data Mining and Graph Analytics, Barcelona, Spain
- Best Paper Award** 2023
- ICML Workshop on Computational Biology, Honolulu, Hawai'i, USA
- Korea National Scholarship** 2021 – 2023
- Awarded by the Ministry of Science and ICT, South Korea
- Poster Competition Excellence Award** 2022
- Awarded at Industrial/Social Problem Solving Session held by Department of ISysE, KAIST
- SIGIR Student Travel Award** 2022
- ACM International Conference on Information and Knowledge Management, Georgia, USA
- Merit Based Scholarship** 2021
- Awarded by the Department of Industrial Engineering, Hanyang University
- Hanyang Academic Achievement Award** 2021
- Awarded within the top 3% among the College of Engineering, Hanyang University
- Certificate of Recognition** 2018
- Awarded when serving military service as an auxiliary police by Seoul Metropolitan Police

#### PROFESSIONAL SERVICES

- Event Organizations**
- Session Chair, Knowledge Representation 3, Birmingham, UK, CIKM (2023)

**Program Committee**

- AAAI (2025)

**Conference Reviews**

- NeurIPS (2023 - ), ICLR (2024 - ), ICML (2024 - ), CVPR (2025), ICCV (2025), ECCV (2024), MICCAI (2025), ACL (2025), COLM (2025), KDD (2025), CPAL (2024 - )

**Workshop Reviews**

- GenAI4Health @ AAAI (2025), ML4LMS @ ICML (2024), ASEA @ AAAI (2024)