



Yoonhyuk Choi (Last update: Apr. 2025)

Samsung SDS
Preceding AI Lab
Research Scientist

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RESEARCH INTEREST

My research interest lies in *Machine Learning* and *Data Mining*, especially in **Large Language Models**, **Retrieval Augmented Generation**, **Recommender Systems**, and **Graph Neural Networks**.

EDUCATION

•Seoul National University

Ph.D. & M.S., Computer Engineering

Mar. 2019 - Aug. 2023

Advisor: [Chong-Kwon Kim](#)

•University of Seoul

B.S., Computer Science

Mar. 2013 - Feb. 2019

Advisor: [Eui-Kyeong Hong](#)

WORK EXPERIENCE

•Research scientist

Samsung SDS, Seoul, South Korea

RAG on knowledge graph, low-rank optimization

Oct. 2024 - Current

•Postdoc. associate

Arizona State University, Tempe, United States (PI: [Selcuk Candan](#) and [Huan Liu](#))

Participating in solving water-related problems (e.g., water quality, storage, and so on)

Nov. 2023 - Sep. 2024

•Postdoc. associate

Korea Institute of Energy Technology, Naju, South Korea (PI: [Chong-Kwon Kim](#))

Applying machine learning to solve energy-related problems

Sep. 2023 - Nov. 2023

•Backend engineer

nTOPAZ, Seoul, South Korea

Front & Back-end development for blockchain service, Tech: 1) Django & jQuery, 2) Node js, 3) JS & CSS

Jun. 2018 - Sep. 2018

PUBLICATIONS ([GOOGLE SCHOLAR](#)) - C: CONFERENCE, J: JOURNAL

- (J13) Beyond Binary: Improving Signed Message Passing in Graph Neural Networks for Multi-Class Graphs

[Yoonhyuk Choi](#), Taewook Ko, Jiho Choi, Chong-Kwon Kim

IEEE TPAMI, To be published (IF: 20.8)

- (C12) Review-Based Hyperbolic Cross-Domain Recommendation

[Yoonhyuk Choi](#), Jiho Choi, Taewook Ko, Chong-Kwon Kim

WSDM, 2025

- (C11) Mitigating Overfitting in Graph Neural Networks via Feature and Hyperplane Perturbation

[Yoonhyuk Choi](#), Jiho Choi, Taewook Ko, Chong-Kwon Kim

WSDM, 2025

- (J10) Beyond Message-Passing: Generalization of Graph Neural Networks via Feature Perturbation for ...

[Yoonhyuk Choi](#), Jiho Choi, Taewook Ko, Chong-Kwon Kim

IEEE TNNLS, 2024 (IF: 14.25)

- (C9) Improving the Text Convolution Mechanism with Large Language Model for Review-Based Recommendation
Yoonhyuk Choi, Fahim Tasneema Azad
IEEE Big Data, 2024 (short)
- (C8) Prioritizing Potential Wetland Areas via Region-to-Region Knowledge Transfer and Adaptive Propagation
Yoonhyuk Choi, Reepal Shah, John Sabo, Selcuk Candan, Huan Liu
IEEE Big Data, 2024
- (C7) Introducing CausalBench: A Flexible Benchmark Framework for Causal Analysis and Machine Learning
Ahmet Kapkic, Pratanu Mandal, Shu Wan, Paras Sheth, Abhinav Gorantla, Yoonhyuk Choi, Huan Liu, K Selçuk Candan
CIKM, 2024 (benchmark)
- (C6) Universal Graph Contrastive Learning with a Novel Laplacian Perturbation
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim
UAI, 2023
- (J5) A spectral graph convolution for signed directed graphs via magnetic laplacian
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim
Neural Networks, 2023 (IF: 7.8)
- (J4) Aspect-oriented unsupervised social link inference on user trajectory data
Hyungho Byun, Yoonhyuk Choi, Chong-Kwon Kim
Information Sciences, 2023 (IF: 8.2)
- (C3) Review-Based Domain Disentanglement without Duplicate Users or Contexts for Cross-Domain ...
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Hyungho Byun, Chong-Kwon Kim
CIKM, 2022
- (C2) Finding Heterophilic Neighbors via Confidence-based Subgraph Matching for Semi-supervised Node ...
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Hyungho Byun, Chong-Kwon Kim
CIKM, 2022
- (J1) Dynamic graph convolutional networks with attention mechanism for rumor detection on social media
Jiho Choi, Taewook Ko, Yoonhyuk Choi, Hyungho Byun, Chong-Kwon Kim
PLOS ONE, 2021 (IF: 2.9)
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- (arXiv) Hierarchical Uncertainty-Aware Graph Neural Network
Yoonhyuk Choi, Chong-Kwon Kim
Preprint, 2025
- (arXiv) Better Not to Propagate: Understanding Edge Uncertainty and Over-smoothing in Signed GNNs
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim
Preprint, 2024

PROJECTS

- **Enhancing Large Language Model with RAG** 2025
Research project, Samsung SDS
 - Knowledge graph construction and RAG for chunk retrieval
 - Tiny-LLM (e.g., Llama 3B) distillation with huge-LLM (e.g., Llama 70B)
- **Can Large Language Model Improve the Text Convolution for Review-Based Recommendation?** 2024
Research project, Emit Lab
 - Integrated the large language model (e.g., Llama 2, GPT-4) with the text convolution algorithm
 - Investigated whether applying summarization based on large language models first, instead of performing 2D convolution on the entire text, results in performance improvement
 - Used online shopping mall datasets like Amazon and Walmart

- Selection Criteria and Assigned Weightage for Identifying Potential Locations Wetland**

Research project funded by NSF (in collaboration with Tulane University)

 - Suggested knowledge transfer between different regions and adaptive propagation between grids
 - Demonstrated the effectiveness of the framework through real-world scenario
 - Used Natural Land Cover Dataset (NLCD), Soil Survey Geographic Database (SSURGO) datasets

2024
- Causal Discovery of Agricultural Mgmt and Reservoir Op. Induced Water Quality Change**

Research project funded by NSF (in collaboration with University of Arkansas)

 - Developed causal discovery algorithm for water quality improvement and reservoir management
 - Considered spatial and temporal variations and validated the causal learning ability
 - Used Natural Land Cover Dataset (NLCD), Soil Survey Geographic Database (SSURGO) datasets

2023
- Tracking footprints with graph neural networks for the reduction of virus spread**

Coursework project, R&D in AI industry

 - Suggested spatial-temporal analysis for the next POI prediction to reduce virus spread
 - Selected as social contributing project
 - Used datasets are Coronamap of South Korea, Gowalla for POI prediction

2021 - 2022
- Personalized recommendation based on the user's purchasing histories and social network**

Industry project funded by Samsung Research

 - Introduced time series analysis of users' purchasing history for personalized advertising
 - Applied graph neural networks with binary recommendation techniques
 - Used customer datasets provided by Samsung Research

2020
- Next POI prediction based on user movements collected through large-scale sensors**

Research project funded by Samsung Electronics

 - Recommending the next place based on where students visited within Seoul National University
 - Developed energy-saving and effective multi-hop transmission technologies for sensor
 - Collected datasets by attaching special stickers to participants

2019

SKILLS

- Languages:** Python, C, HTML/CSS
- Tools / Frameworks:** PyTorch, torch-geometric, Scikit-learn, Git, Django, AWS, LaTeX

EXTRACURRICULAR ACTIVITIES

- Reviewer**

ICLR / IJCAI / ICML / KDD (Feb. track) / TheWebConf / WSDM / CIKM

2025
- Reviewer**

LoG / CIKM / MM / Soft Computing (journal)

2024
- Invited Talk (N-EWN Partner Symposium)**

Titled Identifying Potential Sites for Wetlands, St. Augustine in Florida

2024
- Reviewer**

Journal of IEEE Multimedia / Plos one

2023
- Research Assistant (RA), Graduate**

Funded by Samsung Research

Mar. 2019 - Jun. 2021
- Teaching Assistant (TA)**

Topic: Social Network Analysis and Anomaly Detection (Advisor: Chong-Kwon Kim)

Mar. 2020 - Jun. 2020
- Research Assistant (RA), Undergrad**

Distributed Computing Lab (Supervisor: Jin-Suk Kim)

Jun. 2017 - Sep. 2017

AWARDS & GRANTS

• Best Ph.D. Dissertation Award Seoul National University	2023
• Overseas Short-term Training Scholarship Chonnam National University	2023
• BK21 Colloquium Graduate Student Fellowship Seoul National University	2023
• BK21 Star Student Researcher Fellowship Seoul National University	2023
• SIGIR Travel Awards For ACM Student Authors with Accepted Long Paper	2022
• BK21 Scholarship (Graduate) Seoul National University	2020
• Merit-based Scholarship (Undergrad) University of Seoul	2018 - 2019

REFERENCES

- Selcuk K. Candan:** candan@asu.edu
- ChongKwon Kim:** ckim@kentech.ac.kr
- TaeKyung Kwon:** tkkwon98@gmail.com