



Yoonhyuk Choi (Last update: Dec. 2025)

Assistant Professor

Sookmyung Women's University

Department of Artificial Intelligence

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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

•Assistant Professor

Sep. 2025 -

Sookmyung Women's University, Seoul, South Korea
Department of AI

•Research scientist

Oct. 2024 - Aug. 2025

Samsung SDS, Seoul, South Korea
Preceding AI Lab (LLM, RAG)

•Postdoc. associate

Nov. 2023 - Sep. 2024

Arizona State University, Tempe, United States (PI: [Selcuk Candan](#) and [Huan Liu](#))
School of Computing and Augmented Intelligence (SCAI)

•Postdoc. associate

Sep. 2023 - Nov. 2023

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

•Backend engineer

Jun. 2018 - Sep. 2018

nTOPAZ, Seoul, South Korea
Back-end Engineer

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

- (C17) Sheaf Graph Neural Networks via PAC-Bayes Spectral Optimization ([link](#))

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

AAAI '26

- (J16) Beyond Binary: Improving Signed Message Passing in Graph Neural Networks for Multi-Class Graphs ([link](#))

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

IEEE TPAMI '25 (IF: 20.8)

- (J15) Hierarchical Hyperbolic Embeddings for Review-Driven Cross-Domain Recommendation ([link](#))
Yoonhyuk Choi, Chong-Kwon Kim
IEEE Access '25 (IF: 3.6)
- (J14) Generalization of Knowledge Transfer with User Reviews for Cross-Domain Recommendation ([link](#))
Yoonhyuk Choi, Chong-Kwon Kim
IEEE Access '25 (IF: 3.6)
- (C13) Selective Blocking for Message-Passing Neural Networks on Heterophilic Graphs ([link](#))
Yoonhyuk Choi, Taewook Ko, Jiho Choi, Chong-Kwon Kim
UAI '25
- (C12) Review-Based Hyperbolic Cross-Domain Recommendation ([link](#))
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim
WSDM '25
- (C11) Mitigating Overfitting in Graph Neural Networks via Feature and Hyperplane Perturbation ([link](#))
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim
WSDM '25
- (J10) Beyond Message-Passing: Generalization of Graph Neural Networks via Feature Perturbation for ... ([link](#))
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim
IEEE TNNLS '24 (IF: 14.25)
- (C9) Improving the Text Convolution Mechanism with Large Language Model for ... ([link](#))
Yoonhyuk Choi, Fahim Tasneema Azad
IEEE Big Data '24 (short)
- (C8) Prioritizing Potential Wetland Areas via Region-to-Region Knowledge Transfer and Adaptive Propagation ([link](#))
Yoonhyuk Choi, Reepal Shah, John Sabo, Selcuk Candan, Huan Liu
IEEE Big Data '24
- (C7) Introducing CausalBench: A Flexible Benchmark Framework for Causal Analysis and Machine Learning ([link](#))
Ahmet Kapkiç, Pratanu Mandal, Shu Wan, Paras Sheth, Abhinav Gorantla, Yoonhyuk Choi, Huan Liu, K Selçuk Candan
CIKM '24 (benchmark)
- (C6) Universal Graph Contrastive Learning with a Novel Laplacian Perturbation ([link](#))
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim
UAI '23
- (J5) A spectral graph convolution for signed directed graphs via magnetic laplacian ([link](#))
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim
Neural Networks '23 (IF: 7.8)
- (J4) Aspect-oriented unsupervised social link inference on user trajectory data ([link](#))
Hyungho Byun, Yoonhyuk Choi, Chong-Kwon Kim
Information Sciences '23 (IF: 8.2)
- (C3) Review-Based Domain Disentanglement without Duplicate Users or Contexts for ... ([link](#))
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Hyungho Byun, Chong-Kwon Kim
CIKM '22
- (C2) Finding Heterophilic Neighbors via Confidence-based Subgraph Matching for ... ([link](#))
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Hyungho Byun, Chong-Kwon Kim
CIKM '22
- (J1) Dynamic graph convolutional networks with attention mechanism for rumor detection on social media ([link](#))
Jiho Choi, Taewook Ko, Yoonhyuk Choi, Hyungho Byun, Chong-Kwon Kim
PLOS ONE '21 (IF: 2.9)

- (arXiv) Gauge-Equivariant Graph Networks via Self-Interference Cancellation
[Yoonhyuk Choi](#), Chong-Kwon Kim
Under Review ([ICML '26](#))
- (arXiv) Bias-aware Adaptive Loss for Sequential Recommendation
[Yoonhyuk Choi](#), Chong-Kwon Kim
Under Review ([SIGIR '26](#))
- (arXiv) Adaptive Branch Specialization in Spectral–Spatial Graph Neural Networks for Certified Robustness
[Yoonhyuk Choi](#), Chong-Kwon Kim
Under Review ([TPAMI](#))
- (arXiv) Learning Sheaf Graph Neural Networks with PAC-Bayesian Spectral Guarantees
[Yoonhyuk Choi](#), Yumin Lee, Chanran Kim, Chong-Kwon Kim
Under Review ([TPAMI](#))
- (arXiv) Hierarchical and Uncertainty-Aware Graph Neural Networks for Heterophily and Robustness
[Yoonhyuk Choi](#), Chanran Kim, Chong-Kwon Kim
Under Review ([Information Sciences](#))
- (arXiv) Spectral-Radius and Uncertainty-Aware Blocking in Message-Passing Neural Networks
[Yoonhyuk Choi](#), Chong-Kwon Kim
Under Review ([Information Sciences](#))
- (arXiv) Identifying Heterophilic Neighbors via Confidence-based Subgraph Matching for Graph Neural Networks
[Yoonhyuk Choi](#), Chong-Kwon Kim
Under Review ([Artificial Intelligence](#))

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, Emir 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** 2024
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
- **Causal Discovery of Agricultural Mgmt and Reservoir Op. Induced Water Quality Change** 2023
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
- **Tracking footprints with graph neural networks for the reduction of virus spread** 2021 - 2022
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

•Personalized recommendation based on the user's purchasing histories and social network 2020

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

•Next POI prediction based on user movements collected through large-scale sensors 2019

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

EXTRACURRICULAR ACTIVITIES

•Reviewer	2026
ICLR / AAAI / KDD (Aug. track) / WSDM / TheWebConf	
•Reviewer	2025
ICLR / IJCAI / ICML / KDD (Feb. track) / CIKM / WSDM / TheWebConf	
•Reviewer	2024
LoG / CIKM / MM / Soft Computing (journal)	
•Invited Talk (N-EWN Partner Symposium)	2024
Titled Identifying Potential Sites for Wetlands, St. Augustine in Florida	
•Reviewer	2023
Journal of IEEE Multimedia / Plos one	
•Research Assistant (RA), Graduate	Mar. 2019 - Jun. 2021
Funded by Samsung Research	
•Teaching Assistant (TA)	Mar. 2020 - Jun. 2020
Topic: Social Network Analysis and Anomaly Detection (Advisor: Chong-Kwon Kim)	
•Research Assistant (RA), Undergrad	Jun. 2017 - Sep. 2017
Distributed Computing Lab (Supervisor: Jin-Suk Kim)	

AWARDS & GRANTS

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

- **BK21 Scholarship**

(Graduate) Seoul National University

2020

- **Merit-based Scholarship**

(Undergrad) University of Seoul

2018 - 2019

SKILLS

- **Languages:** Python, C, HTML/CSS

- **Tools / Frameworks:** PyTorch, torch-geometric, Scikit-learn, Git, Django, AWS, LaTex

REFERENCES

- **ChongKwon Kim:** ckim@kentech.ac.kr

- **TaeKyung Kwon:** tkkwon98@gmail.com

- **U Kang:** ukang@snu.ac.kr