



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) Sparse Bayesian Message Passing under Structural Uncertainty
[Yoonhyuk Choi](#), Jiho Choi, Chanran Kim, Yumin Lee, Hawon Shin, Yeowon Jeon, Minjeong Kim, Chong-Kwon Kim
Under Review (IJCAI '26)
- (arXiv) Bias-aware Adaptive Loss for Sequential Recommendation
[Yoonhyuk Choi](#), Jiho 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, Yumin Lee, Chong-Kwon Kim
Under Review (Information Sciences)
- (arXiv) Spectral-Radius and Uncertainty-Aware Blocking in Message-Passing Neural Networks
[Yoonhyuk Choi](#), Jiho Choi, Yumin Lee, Chanran Kim, 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**• Program Committee**

2026

ICLR / AAAI / IJCAI / KDD (Aug. track) / WSDM / TheWebConf

• Program Committee

2025

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

• Program Committee

2024

LoG / CIKM / MM

• 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**

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

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