# Yoonhyuk Choi (Last update: Feb. 2026)

Assistant Professor
Sookmyung Women's University
Department of Artificial Intelligence

E-mail
GitHub
LinkedIn
Homepage


## Research Interest

My research interests lie in *Machine Learning* and *Data Mining*, particularly in **Large Language Models**, **Graph Neural Networks**, and **Recommender Systems**.

## Education

**•Seoul National University** Mar. 2019 - Aug. 2023
*Ph.D. & M.S.*, Computer Engineering Advisor: Chong-Kwon Kim

**•University of Seoul** Mar. 2013 - Feb. 2019
*B.S.*, Computer Science 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*

– Personalized RAG and knowledge graph construction on Knox Systems
– 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** 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 / IJCAI / ICML / AAAI / 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** 2023
Seoul National University

•**SIGIR Travel Awards** 2022
For ACM Student Authors with Accepted Long Paper

•**BK21 Scholarship** 2020
(Graduate) Seoul National University

•**Merit-based Scholarship** 2018 - 2019
(Undergrad) University of Seoul

## 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