



# Yoonhyuk Choi (Last update: Jan. 2026)

Assistant Professor  
Sookmyung Women's University  
Department of Artificial Intelligence

[✉ E-mail](#)  
[GitHub](#)  
[LinkedIn](#)  
[🌐 Homepage](#)

## RESEARCH INTEREST

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

## EDUCATION

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- **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

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- **Assistant Professor**  
**Sookmyung Women's University**, Seoul, South Korea  
Department of AI  
Sep. 2025 -
- **Research scientist**  
**Samsung SDS**, Seoul, South Korea  
Preceding AI Lab (LLM, RAG)  
Oct. 2024 - Aug. 2025
- **Postdoc. associate**  
**Arizona State University**, Tempe, United States (PI: [Selcuk Candan](#) and [Huan Liu](#))  
School of Computing and Augmented Intelligence (SCAI)  
Nov. 2023 - Sep. 2024
- **Postdoc. associate**  
**Korea Institute of Energy Technology**, Naju, South Korea (PI: [Chong-Kwon Kim](#))  
Energy AI  
Sep. 2023 - Nov. 2023
- **Backend engineer**  
**nTOPAZ**, Seoul, South Korea  
Back-end Engineer  
Jun. 2018 - Sep. 2018

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

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- (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 Kapkic, 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

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- **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** 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**

*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

## EXTRACURRICULAR ACTIVITIES

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- Program Committee**

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

2026
- Program Committee**

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

2025
- Program Committee**

LoG / CIKM / MM

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

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- 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** 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

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

## REFERENCES

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- ChongKwon Kim:** ckim@kentech.ac.kr
- TaeKyung Kwon:** tkkwon98@gmail.com
- U Kang:** ukang@snu.ac.kr