



## Yoonhyuk Choi (Last update: Nov. 2025)

Sookmyung Women's University  
Department of Artificial Intelligence  
Assistant Professor

[✉ E-mail](#)  
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### RESEARCH INTEREST

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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

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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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- (J15) 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, 2025 (IF: 20.8)**
- (J14) Generalization of Knowledge Transfer with User Reviews for Cross-Domain Recommendation ([link](#))  
[Yoonhyuk Choi](#), Chong-Kwon Kim  
**IEEE Access, 2025 (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, 2025**
- (C12) Review-Based Hyperbolic Cross-Domain Recommendation ([link](#))  
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim  
**WSDM, 2025**
- (C11) Mitigating Overfitting in Graph Neural Networks via Feature and Hyperplane Perturbation ([link](#))  
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim  
**WSDM, 2025**
- (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, 2024 (IF: 14.25)**
- (C9) Improving the Text Convolution Mechanism with Large Language Model for ... ([link](#))  
Yoonhyuk Choi, Fahim Tasneema Azad  
**IEEE Big Data, 2024 (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, 2024**
- (C7) Introducing CausalBench: A Flexible Benchmark Framework for Causal Analysis and Machine Learning ([link](#))  
Ahmet Kapkış, 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 ([link](#))  
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim  
**UAI, 2023**
- (J5) A spectral graph convolution for signed directed graphs via magnetic laplacian ([link](#))  
Taewook Ko, Yoonhyuk Choi, Chong-Kwon Kim  
**Neural Networks, 2023 (IF: 7.8)**
- (J4) Aspect-oriented unsupervised social link inference on user trajectory data ([link](#))  
Hyungho Byun, Yoonhyuk Choi, Chong-Kwon Kim  
**Information Sciences, 2023 (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, 2022**
- (C2) Finding Heterophilic Neighbors via Confidence-based Subgraph Matching for ... ([link](#))  
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 ([link](#))  
Jiho Choi, Taewook Ko, Yoonhyuk Choi, Hyungho Byun, Chong-Kwon Kim  
**PLOS ONE, 2021 (IF: 2.9)**  
.....
- (arXiv) Gauge-Equivariant Graph Networks via Self-Interference Cancellation  
Yoonhyuk Choi, Chong-Kwon Kim  
**Under Review**
- (arXiv) Sheaf Graph Neural Networks via PAC-Bayes Spectral Optimization  
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Jongwook Kim, Chong-Kwon Kim  
**Under Review**

- (arXiv) Adaptive Branch Specialization in Spectral–Spatial Graph Neural Networks for Certified Robustness  
Yoonhyuk Choi, Chong-Kwon Kim  
Under Review
- (arXiv) Hierarchical and Uncertainty-Aware Graph Neural Networks for Heterophily and Robustness  
Yoonhyuk Choi, Chanran Kim, Chong-Kwon Kim  
Under Review
- (arXiv) Hierarchical Hyperbolic Embeddings for Review-Driven Cross-Domain Recommendation  
Yoonhyuk Choi, Chong-Kwon Kim  
Under Review
- (arXiv) Spectral and Uncertainty-Aware Selective Blocking in Message-Passing Neural Networks  
Yoonhyuk Choi, Chong-Kwon Kim  
Under Review
- (arXiv) Identifying Heterophilic Neighbors via Confidence-based Subgraph Matching for Graph Neural Networks  
Yoonhyuk Choi, Chong-Kwon Kim  
Under Review

## 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** 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

<b>•Next POI prediction based on user movements collected through large-scale sensors</b> <i>Research project funded by Samsung Electronics</i> <ul style="list-style-type: none"> <li>– Recommending the next place based on where students visited within Seoul National University</li> <li>– Developed energy-saving and effective multi-hop transmission technologies for sensor</li> <li>– Collected datasets by attaching special stickers to participants</li> </ul>	2019
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## EXTRACURRICULAR ACTIVITIES

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

## AWARDS & GRANTS

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

## 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