



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

Sookmyung Women's University  
Department of Artificial Intelligence  
Assistant Professor

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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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- (J14) 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)
- (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 Kapkıcı, 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) Sheaf Graph Neural Networks via PAC-Bayes Spectral Optimization  
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Jongwook Kim, Chong-Kwon Kim  
**Under Review (AAAI), 2026**
- (arXiv) Adaptive Branch Specialization in Spectral-Spatial Graph Neural Networks for Certified Robustness  
Yoonhyuk Choi, Jiho Choi, Chong-Kwon Kim  
**Under Review (AAAI), 2026**
- (arXiv) Hierarchical and Uncertainty-Aware Graph Neural Networks for Heterophily and Robustness  
Yoonhyuk Choi, Jiho Choi, Taewook Ko, Chong-Kwon Kim  
**Under Review (WSDM), 2026**

## 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
  
- 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

## SKILLS

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

## 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 / WSDM / CIKM	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

## REFERENCES

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