



Yoonhyuk Choi (Last update: Nov. 2025)

Sookmyung Women's University
Department of Artificial Intelligence
Assistant Professor

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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** 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 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)

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- (arXiv) Gauge-Equivariant Graph Networks via Self-Interference Cancellation
Yoonhyuk Choi, 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) Spectral-Radius and Uncertainty-Aware 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

- **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 <i>Research project funded by Samsung Electronics</i> <ul style="list-style-type: none"> – 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
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EXTRACURRICULAR ACTIVITIES

•Reviewer ICLR / AAAI / KDD (Aug. track) / WSDM / TheWebConf	2026
•Reviewer ICLR / IJCAI / ICML / KDD (Feb. track) / CIKM / WSDM / TheWebConf	2025
•Reviewer LoG / CIKM / MM / Soft Computing (journal)	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

•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 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