

# Jinhyuk Yun, Ph.D.

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## Research Statement

I study human knowledge as a **living interactive network**, and how ideas diffuse through it. Beginning with my doctoral work on spreading processes in human society, I have asked why some ideas, innovations, and creative forms propagate while others do not. I work with collective knowledge systems because their record is complete: every contribution, citation, and revision is timestamped and public, which is what makes models testable. I hold mine to a predictive standard, from agent-based simulation of spreading dynamics to generative diffusion models of how artistic styles evolved. My research runs across **collective knowledge platforms** (Wikipedia, Wikidata, GitHub, Stack Overflow), **the evolution of science and technology** (papers and patents), and **creativity in cultural domains** (art and music). AI is now reshaping this network and, increasingly, participating in it: my current work examines how AI agents produce, distort, and diffuse knowledge, and when their output can be trusted.

## Career

- 2026/03– **Visiting Researcher**, *Max Planck Institute for Security and Privacy (MPI-SP)*, Bochum, Germany.  
2027/02 Data Science for Humanity Group
- 2024/09– **Associate Professor**, *Soongsil University*, Seoul, South Korea.  
present School of AI Convergence
- 2020/03– **Assistant Professor**, *Soongsil University*, Seoul, South Korea.  
2024/08 School of AI Convergence
- 2016/12– **Senior Research Scientist**, *Korea Institute of Science and Technology Information*  
2020/02 (*KISTI*), Seoul, South Korea.  
Future Technology Analysis Center
- 2016/08– **Data Scientist**, *Naver Corporation*, Seongnam, South Korea.  
2016/12 Naver Search

## Education

- 2010/02– **Ph.D. Physics**, *KAIST*, Daejeon, South Korea.  
2016/08 Integrated M.S.–Ph.D. program; no separate M.S. degree is conferred in this track.  
Thesis: Theoretical Study on Spreading in Human Society  
Advisor: Hawoong Jeong
- 2005/03– **B.S. Physics**, *KAIST*, Daejeon, South Korea.  
2010/01
- 2008/08– **Exchange Student**, *INSA*, Lyon, France.  
2009/07

## Featured Publications

***Bold** indicates the author; <sup>†</sup> corresponding or co-corresponding author.*

- 2026 Jin Kim, Byunghwee Lee, Taekho You<sup>†</sup>, **Jinhyuk Yun<sup>†</sup>**, Context-aware Multimodal AI Navigates Hidden Pathways in Five Centuries of Art Evolution, *Proceedings of the National Academy of Sciences* 123(30), e2517969123.

- 2025 Seoyoung Park, Sanghyeok Park, Taekho You<sup>†</sup>, **Jinhyuk Yun<sup>†</sup>**, Social links vs. language barriers: decoding the global spread of streaming content, *Humanities and Social Sciences Communications* 12, 76.
- 2023 Gangmin Son, **Jinhyuk Yun<sup>†</sup>**, Hawoong Jeong<sup>†</sup>, Untangling pair synergy in the evolution of collaborative scientific impact, *EPJ Data Science* 12, 62.
- 2022 **Jinhyuk Yun<sup>†</sup>**, Generalization of bibliographic coupling and co-citation using the node split network, *Journal of Informetrics* 16(2), 101291. [Single author]
- 2019 **Jinhyuk Yun**, Sang Hoon Lee<sup>†</sup>, Hawoong Jeong<sup>†</sup>, Early onset of structural inequality in the formation of collaborative knowledge in all Wikimedia projects, *Nature Human Behaviour* 3, 155–163. [Cover article]

## Teaching

### Associate Professor, Soongsil University

*Undergraduate* Machine Learning (Fall 2024–2025), Introduction to AI (Fall 2023), Big Data Programming (Spring 2021–2023), AI Mathematics Basics (Spring 2022–2025), Programming Basics 2 (Fall 2021), Probability and Statistics (Fall 2020–2022), Data Structure (Spring 2020–2021, 2025)

*Graduate* Network Science and Graph Embedding (Fall 2023)

*Recognition* Soongsil Fellowship Professor (Excellence in Teaching), Soongsil University, 2022 and 2025

## Research Supervision

**Advanced Data Science Laboratory (ADSL), Soongsil University** (2020–present): 1 postdoctoral researcher, 6 M.S. students, and 8 undergraduate researchers supervised to date.

*Doctoral committees* Member of four doctoral examination committees, in physics, sociology, and industrial and management engineering. Candidates included Jisung Yoon (now Assistant Professor, KDI School of Public Policy and Management), Taekho You (now Research Professor, KAIST), Eunrang Kwon (now Associate Research Fellow, Korean Women’s Development Institute), and Young Jin Kim (now Senior Researcher, Korea Institute of Science and Technology Information). Each is a long-term research collaborator with whom I have co-authored peer-reviewed publications.

*External mentoring* Second mentor and co-corresponding author for doctoral students based at other institutions, including Gangmin Son (KAIST) and Gahyoun Gim (Gyeongsang National University), each of whom published their work as first author in *EPJ Data Science*.

*Postdoctoral* Taekho You (2021–2022; Visiting Scholar 2022–2023), now Research Professor at the Center for Digital Humanities & Computational Social Sciences, KAIST

*M.S., completed* Jin Kim (2022–2024; continued as researcher 2024–2025), now AI Researcher at Tantancore; Sanghyeok Park (2023–2025; continuing as researcher 2025–present); Seunghoon Baek (2023–2025), now CAIO at Badminton Friends

*M.S., in progress* Minji Kang (expected 2026), Yujin Ko, Min Jung Kang

*Undergraduate* Eight undergraduate researchers (2020–present): Sungyong Kim, Juyoung Kim, Seoyoung Park, Seran Park, Jin A Lee, Minsung Sim, Dong Gyun Seo, Yujin Kwon

*Outcomes* Supervised students hold first authorship on the majority of the group’s principal publications, including *PNAS* (2026; Jin Kim, who began the work as an M.S. student) and *Humanities and Social Sciences Communications* (2025; Seoyoung Park, beginning as an undergraduate intern, now Researcher at the Korea Institute of Science and Technology Information). Doctoral candidates I have examined now hold positions across a research university, a policy graduate school, a national research institute, and a government policy institute. Other alumni have continued to a Master’s programme at Politecnico di Milano.

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## Grants and Awards

### Research Grants (PI)

*Total awarded as principal investigator: KRW 945.0 million (approx. EUR 568,000), including overheads. Converted at EUR 1 = KRW 1,660 (July 2026).*

- 2022–2027 PI, National Research Foundation of Korea (NRF; Mid-Career Researcher Program), *Study on the innovation and knowledge diffusion using graph neural network and graph embedding* (KRW 423.4M; approx. EUR 255,000)
- 2022 PI, Korea Institute of Science and Technology Information (KISTI), *A study on efficient clustering methods for large-scale scientific literature dataset* (KRW 80.0M; approx. EUR 48,000)
- 2020–2022 PI, National Research Foundation of Korea (NRF; Mid-Career Researcher Program), *A study on the hidden bias of artificial intelligence and big data from a complex system analysis* (KRW 141.6M; approx. EUR 85,000)
- 2017–2020 PI, National Research Foundation of Korea (NRF; Strategic Project on the Industrial Mathematics), *Study on the Knowledge Ecosystem of 4th Industrial Revolution using Big Data* (KRW 300.0M; approx. EUR 180,000)

### Research Grants (Co-PI)

*Collaborative and consortium projects; individual shares are not separately attributed.*

- 2024–2027 Co-PI, National Research Foundation of Korea (NRF; Global Humanities and Social Sciences Convergence Research Grant), *Exploring the Co-evolutionary Dynamics of Artificial Intelligence and Society: A Computational Social Science Approach*
- 2022–2029 Co-PI, Institute for Information & Communications Technology Planning & Evaluation (IITP), *Innovative Human Resource Development for Local Intellectualization*
- 2020–2023 Co-PI, Institute for Information & Communications Technology Planning & Evaluation (IITP), *National Program for Excellence in SW*
- 2020–2022 Co-PI, National Research Foundation of Korea (NRF; LINC+), *4th Industrial Revolution Innovation Leading University (AI Mobility)*
- 2018–2020 Co-PI, Korea Institute of Science and Technology Information (KISTI), *Development of Future Technology Analysis System Based on Open Data*
- 2017–2018 Co-PI, Korea Institute of S&T Evaluation and Planning (KISTEP), *Development of government R&D package investment model for the 4th industrial revolution*
- 2017 Co-PI, Korea Institute of Science and Technology Information (KISTI), *Development of Technology Intelligence System for Exploring Future Technologies*

### Awards

- 2026 Editorial Contribution Award & Author Service Award (Editor of Distinction), *Humanities and Social Sciences Communications*, Springer Nature
- 2022, 2025 Soongsil Fellowship Professor (Excellence in Teaching), Soongsil University
- 2021 Best Paper Award (Division: Open Source), KCC2021, Jeju, South Korea
- 2019 Outstanding Researcher Award (Best Paper), Korea Institute of Science and Technology Information
- 2018 Outstanding Young Researcher Award, Korea Institute of Science and Technology Information
- 2016 Young Investigator Training Award, Challenges in Data Science, Matera, Italy

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## Academic Service

- 2026/05– Editorial Board Member, *New Physics: Sae Mulli*
- 2023/11– Handling Editor, *Humanities and Social Sciences Communications*, Springer Nature. Recipient of the Editorial Contribution Award and the Author Service Award (Editor of Distinction), 2026.
- Grant review* Reviewer for the National Research Foundation of Korea (NRF), the national research funding agency, 2020–present. Panels across the full career ladder: Young Researcher and Mid-Career Researcher Programs, postdoctoral fellowships, and doctoral and master’s student research grants.
- Peer review* *Nature Human Behaviour*, *npj Complexity*, *Journal of Informetrics*, *Journal of Computational Social Science*, *Journal of Computational Science*, *Journal of the Korean Physical Society*, *New Physics: Sae Mulli*, among others
- Institutional* Soongsil University: Admissions interviewer, School of AI Convergence (2023, 2025); appointed admissions officer, Office of Admissions (2025)

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## Publications

**Bold** indicates the author; <sup>†</sup> corresponding or co-corresponding author.

### I. The Structure of Collective Knowledge

- 2025 Seoyoung Park, Sanghyeok Park, Taekho You<sup>†</sup>, **Jinhyuk Yun<sup>†</sup>**, Social links vs. language barriers: decoding the global spread of streaming content, *Humanities and Social Sciences Communications* 12, 76.
- 2021 Kim Danu, Lee Damin, Jaehyeon Myung, Changwook Jung, Inho Hong, Diego Sáez-Trumper, **Jinhyuk Yun**, Jung Woo-Sung, Meeyoung Cha, Information Collection of COVID-19 Pandemic Using Wikipedia Template Network, *Journal of KIISE* 49(5), 347–353.
- 2019 **Jinhyuk Yun**, Sang Hoon Lee<sup>†</sup>, Hawoong Jeong<sup>†</sup>, Early onset of structural inequality in the formation of collaborative knowledge in all Wikimedia projects, *Nature Human Behaviour* 3, 155–163. [Cover article]
- 2018 Jisung Yoon, **Jinhyuk Yun<sup>†</sup>**, Woo-Sung Jung<sup>†</sup>, Build Up of a Subject Classification System from Collective Intelligence, *New Phys.: Sae Mulli* 68, 647–654.
- 2016 **Jinhyuk Yun**, Sang Hoon Lee<sup>†</sup>, Hawoong Jeong<sup>†</sup>, Intellectual interchanges in the history of massive online open-editing encyclopedia, Wikipedia, *Phys. Rev. E* 93, 012307.

### II. Pathologies of the Knowledge Ecosystem

- 2025 Taekho You, Jinseo Park, June Young Lee, **Jinhyuk Yun<sup>†</sup>**, Regional profile of questionable publishing, *Journal of Informetrics* 19, 101670.
- 2024 Taekho You, Jinseo Park, June Young Lee, **Jinhyuk Yun<sup>†</sup>**, Auditing citation polarization during the early COVID-19 pandemic, *Quantitative Science Studies* 5, 906–921.
- 2023 Eunrang Kwon, **Jinhyuk Yun<sup>†</sup>**, Jeong-han Kang<sup>†</sup>, The effect of the COVID-19 pandemic on gendered research productivity and its correlates, *Journal of Informetrics* 17(1), 101380.
- 2023 Eunrang Kwon, **Jinhyuk Yun<sup>†</sup>**, Jeong-han Kang<sup>†</sup>, Dataset for the analysis of gendered research productivity affected by early COVID-19 pandemic, *Data in Brief* 48, 109200.
- 2022 Taekho You, Jinseo Park, June Young Lee, **Jinhyuk Yun<sup>†</sup>**, Woo-Sung Jung<sup>†</sup>, Disturbance of questionable publishing to academia, *Journal of Informetrics* 16(2), 101294.

### III. Creativity and the Evolution of Knowledge

- 2026 Jin Kim, Byunghwee Lee, Taekho You<sup>†</sup>, **Jinhyuk Yun<sup>†</sup>**, Context-aware Multimodal AI Navigates Hidden Pathways in Five Centuries of Art Evolution, *Proceedings of the National Academy of Sciences*, 123(30), e2517969123.

- 2025 Gahyoun Gim, **Jinhyuk Yun**<sup>†</sup>, Sang Hoon Lee<sup>†</sup>, Quantifying interdisciplinary synergy in higher STEM education, *EPJ Data Science* 14, 56.
- 2023 Gangmin Son, **Jinhyuk Yun**<sup>†</sup>, Hawoong Jeong<sup>†</sup>, Untangling pair synergy in the evolution of collaborative scientific impact, *EPJ Data Science* 12, 62.
- 2023 Jisung Yoon, Jinseo Park, **Jinhyuk Yun**<sup>†</sup>, Woo-Sung Jung<sup>†</sup>, Quantifying knowledge synchronization with the network-driven approach, *Journal of Informetrics* 17(4), 101455.
- 2015 **Jinhyuk Yun**, P.-J. Kim<sup>†</sup>, H. Jeong<sup>†</sup>, Anatomy of scientific evolution, *PLoS ONE* 10(2): e0117388.

#### IV. Computational Methods for Knowledge Representation

- 2022 **Jinhyuk Yun**<sup>†</sup>, Generalization of bibliographic coupling and co-citation using the node split network, *Journal of Informetrics* 16(2), 101291.
- 2020 **Jinhyuk Yun**, S. Ahn, J.Y. Lee<sup>†</sup>, Return to basics: Clustering of scientific literature using structural information, *Journal of Informetrics* 14(4), 101099.

#### Others

- 2026 Seungheon Baek, **Jinhyuk Yun**<sup>†</sup>, Bridging the Gap: Doubles Badminton Analysis with Singles-Trained Models, *Signal Processing: Image Communication* (accepted).
- 2024 **Jinhyuk Yun**<sup>†</sup>, Comparative Analysis of International Collaboration of Three National-level English Physics Journals, *New Phys.: Sae Mulli* 74, 728–738.
- 2023 Jin Min Kim, Jae Hwan Lee, **Jinhyuk Yun**, Wooseop Kwak, Restricted curvature model on a tetrahedral fractal substrate, *Journal of the Korean Physical Society* 82(7), 623–628.
- 2022 Sungyong Kim, **Jinhyuk Yun**<sup>†</sup>, Analysis of risk propagation using the world trade network, *Journal of the Korean Physical Society* 81(7), 697–706.
- 2022 Juyoung Kim, **Jinhyuk Yun**<sup>†</sup>, Crime and social environments: differences between misdemeanors and felonies, *Journal of the Korean Physical Society* 81(2), 179–190.

#### Books, Translations, and Research Reports

- 2026 Sergey N. Dorogovtsev and José F. F. Mendes, *The Nature of Complex Networks*, translated by Sang Hoon Lee, Mijin Lee, Heetae Kim, Seungwoo Son, **Jinhyuk Yun**, and Eun Lee, Acorn Publishing, Seoul (2026). [Korean translation of the Oxford University Press edition; Selected as Outstanding Academic Book, National Academy of Sciences of Korea, 2026]
- 2023 Albert-László Barabási, *Network Science*, translated by Mijin Lee, **Jinhyuk Yun**, Sang Hoon Lee, Eun Lee, Hanghyun Cho, Heetae Kim, and Seungwoo Son, Acorn Publishing, Seoul (2023). [Korean translation of the Cambridge University Press edition; Selected as Outstanding Academic Book, National Academy of Sciences of Korea, 2024]
- 2022 Mark Newman, *Networks*, 2nd ed., translated by Heetae Kim, Seungwoo Son, **Jinhyuk Yun**, Hanghyun Cho, Eun Lee, Sang Hoon Lee, and Mijin Lee, Acorn Publishing, Seoul (2022). [Korean translation of the Oxford University Press edition]
- 2019 Jinseo Park, **Jinhyuk Yun**, and June Young Lee, Comparative study of the predatory journals by country and field, KISTI Data Insight No.8.
- 2018 **Jinhyuk Yun** and Young Jin Kim, Future of the open innovation on the GitHub, KISTI Data Insight No.3.

#### Under Review

Fatemeh Seyedin, Adrian Weller, **Jinhyuk Yun**, Mahmoudreza Babaei, The Politician, the Liar, and the Obedient Worker: Emerging Behavior of LLM Agents in Hierarchical Games.

Sanghyeok Park, Minji Kang, Hosung Kwak, **Jinhyuk Yun**<sup>†</sup>, SWORD: Wikidata-based Distortions Reveal Hidden Cross-Lingual Inconsistencies in LLM Factual Error Rejection, under review.

Hosung Kwak, Sanghyeok Park, Hawoong Jeong, Jisung Yoon<sup>†</sup>, **Jinhyuk Yun**<sup>†</sup>, Simple and Scalable Graph Embeddings Detect Update-Prone Triples in Living Knowledge Graphs, under review.

**Jinhyuk Yun**, Break to preserve: Hybrid node splitting for scalable multi-relatedness-based clustering, under review. [**Single author**]

## Technical Skills

|                    |                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------|
| Programming        | C, C++, Python, CUDA, MATLAB                                                                    |
| Machine learning   | PyTorch, Scikit-learn, Gensim                                                                   |
| Foundation models  | HuggingFace Transformers, CLIP, Diffusers (Stable Diffusion)                                    |
| Data visualization | Gephi, Cytoscape, Matplotlib, Gnuplot                                                           |
| Analysis tools     | NetworkX, Pandas, Dask, NumPy, SciPy                                                            |
| Human languages    | Korean (Native), English (Advanced), French (Intermediate), Japanese (Basic), German (Beginner) |