

Jisung Yoon

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PROFESSIONAL APPOINTMENTS

KDI School of Public Policy and Management , Sejong-si, Republic of Korea Assistant Professor	Jun 2024 – Present
Northwestern University , Evanston, IL, USA Postdoctoral Fellow, Management & Organizations, Kellogg School of Management (Affiliated with the Northwestern Institute on Complex Systems) Advisor: Hyejin Yoon	Aug 2022 – Apr 2024
Pohang University of Science and Technology (POSTECH) , Pohang, Republic of Korea Lecturer, Department of Industrial and Management Engineering	Aug 2020 – Aug 2021
Indiana University Bloomington , Bloomington, IN, USA Visiting Researcher, Luddy School of Informatics, Computing, and Engineering (Affiliated with the Center for Complex Networks and System Research) Advisor: Yong-Yeol Ahn	Feb 2019 – Aug 2020

EDUCATION

Pohang University of Science and Technology (POSTECH) , Pohang, Republic of Korea Combined M.S./Ph.D. in Industrial and Management Engineering Advisor: Woo-Sung Jung	Mar 2016 – Aug 2022
B.S. in Industrial and Management Engineering	Mar 2011 – Feb 2016

RESEARCH INTEREST

Computational Social Science
Machine Learning & Network Science (representation learning, graph embedding, community detection)
Science of Science (AI, scientific mobility, collective intelligence)
Bureaucracy and coordination mechanism (organization theory, coordination cost)

RESEARCH METHODS

Complex Network Analysis and Statistical Modeling
Machine Learning
Representation Learning
Natural Language Processing

TEACHING EXPERIENCE

TEACHING

<i>Business Analytics</i> (IMEN473), POSTECH	Spring 2021
Co-lecture with Prof. Minseok Song	
<i>Information System Technology</i> (IMEN 281), POSTECH	Fall 2020
Co-lecture with Prof. Minseok Song	

GUEST LECTURE

<i>Introduction to Management Information System</i> (IDS 200), College of Business Administration, University of Illinois Chicago	Fall 2023
<i>Introduction to Artificial Intelligence</i> , School of AI Convergence, Soongsil university	Fall 2023

TEACHING ASSISTANT

<i>Winning with networks</i> (MBA Course), Kellogg School of Management, Northwestern University	Winter 2023
<i>Information System Technology</i> (IMEN 281), POSTECH	Fall 2015
<i>Programming and Problem solving</i> (CSED 101), POSTECH	Spring, Fall 2013

PUBLICATIONS († Equally contributed)

D. Murray†, J. Yoon†, S. Kojaku†, R. Costas, W.-S. Jung, S. Milojevic, and Y.-Y. Ahn. "Unsupervised embeddings of trajectories capture the latent structure of global scientific mobility." *PNAS* 120, 52, e2305414120 (2023). (covered by [josun ilbo](#), [maeil business](#))

J. Yoon, J. Park, W.-S. Jung and J. Yun. "Quantifying the knowledge synchronization in the 21st century." *Journal of Informetrics* 17, 4 (2023). (covered by [hannkook ilbo](#))

J. Yoon, W.-S. Jung, and H. Kim. "COVID-19 confines recreational gathering in Seoul to familiar, less crowded, and neighboring urban areas." *Humanities and social sciences communications* 9, 330 (2022).

S. Jo, C. Park, J. Yoon and W.-S. Jung. "Revealing role of Korean Physics Society with keyword co-occurrence network." *Journal of Korean Physical Society* 81, 368–376 (2022).

M.-J. Kim, J. Yoon, W.-S. Jung and H. Kim. "Quantifying the topic disparity of scientific papers." *2nd International Workshop on Scientific Knowledge Representation, Discovery, and Assessment in conjunction with The Web Conference 2022* (2022).

S. Kojaku, J. Yoon, I. Constantino, and Y.-Y. Ahn. "Residual2Vec: Debiasing graph embedding with random graphs." *NeurIPS 2021 (2021)*.

J. Yoon, K.-C. Yang, W.-S. Jung, and Y.-Y. Ahn. "Persona2vec: A flexible multi-role representations learning framework for graphs." *PeerJ Computer Science* 7:e439 (2021).

T.-H. You, J. Yoon, O.-H. Kwon and W.-S. Jung. "Tracing the evolution of physics with a keyword co-occurrence network." *Journal of Korean Physical Society* 78, 236-243 (2021).

M.-Y. Lee, J. Yoon, Y.-R. Jo and W.-S. Jung. "Topology analysis on the national wicked problems using keyword network." *Journal of Korea Technology Innovation Society* 23 (5), 863-889 (2020).

J. Yoon, J. Yun and W.-S. Jung. "Build up of a subject classification system from the collective intelligence." *New Physics: Sae Mulli* 68: 647-654 (2018).

WORKING PAPERS

J. Yoon, C. Kempes, V.-C. Yang, S. Lee, G. West, and H. Youn. "What makes Individual I's a Collective We; Coordination mechanism & costs." arXiv preprint: arXiv:2306.02113.

R. Aiyappa, X. Wang, M. Kim, O. C. Seckin, J. Yoon, Y.-Y. Ahn, S. Kojaku. "Implicit degree bias in the link prediction task." arXiv preprint: arXiv:2405.14985.

S. Lee, T. Kim, J. Yoon, and H. Youn. "Growth and Disruption in Legal Systems"

O. Kwon, J. Yoon, and H. Youn. "Suspense and Surprise in Innovations: Probability of Being Realized and Feasibility of Space"

S. Lee, J. Yoon, and H. Youn. "Will AI take over my business? Fear or fantasy about AI Technology in firms' annual reports."

S. Bhattacharya, J. Yoon, and H. Youn. "Unveiling Scaling Laws in Regulatory Functions of Online Platforms"

J. Yoon, M. Bahram, S. Balcisoy, B. Bozkaya, W.-S. Jung, A. Pentland, and Y.-Y. Ahn. "Assessing diversity of business categories in commercial districts and its association with merchants' revenue using neural embedding."

D. Lee, J. Yoon, M.-Y. Lee, T. You and W.-S. Jung. "Impact of the hardfork on the network of Ethereum transaction: Address of genesis and miner."

CONFERENCES, WORKSHOPS AND INVITED TALK

J. Yoon, C. Kempes, V-C. Yang, S. Lee, G. West, and H. Youn. "What makes Individual I's a Collective We; Coordination mechanism & costs."

TIM Division and Organization Science Virtual Research, virtual, Sep 21, 2023 (Oral)

NSF-SFI: From cells to Societies: Regulatory Mechanisms at work, Santa Fe, USA, June 13-15, 2023 (Oral)

2nd International Conference Science of Science and Innovation, Evanston, USA, June 26-28, 2023 (Poster)

Collective Intelligence Symposium & Short Course: Foundations + Radical Ideas, Santa Fe, USA, June 19-23, 2023 (Poster)

J. Yoon, D. Murray, S. Kojaku, R. Costas, S. Milojevic, W.-S. Jung and Y.-Y. Ahn. "Unsupervised embeddings of organizations capture the latent structure of global scientific mobility."

POSTECH IME Seminar, Jan 04, 2024 (Invited talk)

Korea Advanced Institute of Science & Technology STP, Dec 28, 2023 (Invited talk)

Complex Systems Research Exchange, virtual, Oct 31, 2023 (Invited talk)

2022 Informs Annual Meeting, Indianapolis, USA, Oct 16-19, 2022 (Oral)

7th International Conference on Computational Social Science, ETH Zurich (virtual), July 27-31, 2021 (Oral)

Networks 2021, Virtual, July 5-10, 2021 (Oral)

NetSci 2020, Rome, Italy, September 17-25, 2020 (Poster)

6th International Conference on Computational Social Science, Cambridge, USA, July 17-20, 2020 (Poster)

J. Yoon, J. Park, W.-S. Jung and J. Yun. "Quantifying the knowledge synchronization in the 21st century."

Wikimedia Research Showcase, Wikimedia Foundation, June 15, 2022 (Invited talk)

2nd International Conference Science of Science and Innovation, Evanston, USA, June 26-28, 2023 (Oral)

8th International Conference on Computational Social Science, Chicago, USA, July 19-22, 2022 (Oral)

Conference on Complex System 2019, NTU, Singapore, Oct 1, 2019 (Oral)

NetSci 2020, Rome, Italy, September 17-25, 2020 (Poster)

J. Yoon, H. Kim, and W.-S. Jung. "COVID-19 confines social gathering to familiar, less crowded, and neighboring urban areas."

Korean Academy of Complex System 2021 Fall conference, Seoul, Republic of Korea, Nov 6, 2021 (Oral)

Networks 2021, Virtual, July 5-10, 2021 (Oral)

J. Yoon, K.-C. Yang, W.-S. Jung, and Y.-Y. Ahn. "Persona2vec: Embedding networks with pervasively overlapping communities."

6th International Conference on Computational Social Science, Cambridge, USA, July 17-20, 2020 (Oral)

NetSci 2020, Rome, Italy, September 17-25, 2020 (Poster)

J. Yoon, M. Bahram, S. Balcisoy, B. Bozkaya, W.-S. Jung, A. Pentland, and Y.-Y. Ahn. "Assessing diversity of business categories in commercial districts and its association with merchants' revenue using neural embedding."

2022 Informs Annual Meeting, Indianapolis, USA, Oct 16-19, 2022 (Poster)

8th International Conference on Computational Social Science, Chicago, USA, July 19-22, 2022 (Poster)

J. Yoon. "Network representation learning and its applications."

Joint seminar on Data Science and Complexity in Social Systems, Virtual, July 17-20, 2020 (Invited talk)

J. Yoon, J. Yun, and W.-S. Jung. "Building-up the data-driven science and technology classification system with collective intelligence data."

DISC 2018, Seoul, Republic of Korea, Jul 5, 2018 (Oral)

Korean Institute of Industrial Engineers conference, Seoul, Republic of Korea, April 5, 2018 (Oral)

Korean Academy of Complex System 2017 Fall conference, Seoul, Republic of Korea, Nov 25, 2017 (Oral)

S. Lee, J. Yoon, and H. Youn. "Will AI take over my business? Fear or fantasy about AI Technology in firms' annual reports"

2nd International Conference Science of Science and Innovation, Evanston, USA, June 26-28, 2023 (Poster)

O. Kwon, J. Yoon, and H. Youn. "Is innovation suspense or surprise?"

2nd International Conference Science of Science and Innovation, Evanston, USA, June 26-28, 2023 (Poster)

S. Kojaku, J. Yoon, I. Constantino, and Y.-Y. Ahn. "Residual2Vec: Debiasing graph embedding with random graphs."

7th International Conference on Computational Social Science, ETH Zurich (virtual), July 27-31, 2021 (Oral)

Networks 2021, Virtual, July 5-10, 2021 (Oral)

M.-J. Kim, J. Yoon, H. Kim and W.-S. Jung. "Neural embedding of research papers reveals characteristics of policy research institutes."

Networks 2021, Virtual, July 5-10, 2021 (Oral)

Korean Academy of Complex System 2019 Fall conference, Seoul, Republic of Korea, Nov 23, 2019 (Oral)

O.-H. Kwon, J. Yoon, D. Lee, H. Kim, and W.-S. Jung. "Dividing marketing area from platform business data with network community detection."

Networks 2021, Virtual, July 5-10, 2021 (Oral)

D. Lee, J. Yoon, M.-Y. Lee, T. You and W.-S. Jung. "Impact of the hardfork on the network of Ethereum transaction: Address of genesis and miner."

Networks 2021, Virtual, July 5-10, 2021 (Oral)

J. Lee, J. Yoon, and W.-S. Jung. "Modeling the Gap between Market Shares and Preference with Simple Group Decision Model."

Korean Academy of Complex System 2019 Fall conference, Seoul, Republic of Korea, Nov 23, 2019 (Oral)

M.-Y. Lee, J. Yoon, and W.-S. Jung. "Identifying evolution pattern on the national wicked problems."

Korea technology Innovation Society 2019 Fall conference, Seoul, Republic of Korea, Nov 5, 2019 (Oral)

PATENTS

O.-H. Kwon, H. Kim, D. Lee W.-S. Jung, and J. Yoon, "Commercial area analysis method for classifying commercial areas using a user-based data and network approach" KR 10-2021-009373 (KR), June 2021.

T. You, J. Yoon, W.-S. Jung, and O.-H. Kwon, "Method and system for representative keywords in research field using keyword cooccurrence analysis." KR 10-2020-0039380 (KR), May 2020.

GRANTS & HONORS

GRANTS

International Cooperation Program, BK21, POSTECH, Republic of Korea ("Exploring Science of Science with graph embedding." ca. \$2,500)	Mar 2019 – Jun 2019
Nonprofit Startup Incubator Program, Seoul NPO Center, Republic of Korea ("Prisming: Blockchain for in-kind donation." ca. \$4,000)	Jun 2018 – Dec 2018

HONORS

Best paper award, <i>Korean Academy of Complex System 2019 Fall conference, Seoul, Republic of Korea</i>	Nov 2021
Excellence award, <i>The 15th KIAS-APCTP Winter School on Statistical Physics, Pohang, Republic of Korea</i>	Jan 2018

PROFESSIONAL SERVICES

Program Committee – Wikimedia Research Fund 2023, 2024, Wiki Workshop 2024

Peer review for Journal – Management Science, Humanities and social sciences communications, Scientific Reports, PLoS One, Physica A

Peer review for Conferences – The ACM Web Conference (WWW), ICONIP

ADVISING & CO-ADVISING

Seoul Lee, Ph.D. Candidates, Kellogg School of Management, Northwestern	2022 – Present
Shambhobi Bhattacharya, Ph.D. Candidates, Industrial Engineering, Northwestern	2023 - Present
Sari Eisen, Undergraduate in Data Science Program, Northwestern	2023 - Present
Hosung Kwak, Undergraduate in Physics, SNU	2023 - Present
Oh-hyun kwon, Ph.D. Candidates, Physics, POSTECH	2019 - Present
Damin Lee, Ph.D. Candidates, Physics, POSTECH	2019- Present
Jungwoo Lee, MS in Social Data Science, POSTECH	2022
Jisu Lee, MS in Social Data Science, POSTECH	2022
Munjung Kim, Undergraduate in Physics, POSTECH	2019 - 2022
Jaewon Lee, Undergraduate in Physics, POSTECH	2019

WORK EXPERIENCES

Context Logic Korea, Seoul, Republic of Korea

Software Engineer and Data analysts (Internship) Jan 2015 – Jun 2015

Penta Security Inc., Seoul, Republic of Korea

Software Backend Engineer (Internship) Jun 2014 – Dec 2014

COMPUTATIONAL SKILLS

Computing Languages: Python, Julia, C, C++, JavaScript
Workflow for Reproducible Data Analysis: Snakemake
Machine Learning Libraries: Pytorch, Tensorflow
Web Development Languages: JavaScript, PHP
Network Visualization Software: Gephi, Pajek, Observable

REFERENCES

Dr. Woo-Sung Jung, *Professor*
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