

## Hyeon-Ju Jeon

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CONTACT INFORMATION	Data Assimilation Group, Data Preprocessing Team Korea Institute of Atmospheric Prediction Systems (KIAPS) Seoul, Korea	+82(0)10-5153-0105 hjjeon@kiaps.org higd963@gmail.com
RESEARCH INTERESTS	Spatiotemporal Graph Neural Network Graph Representation Learning Multi-modal and Irregular Real-world Data Analysis Explainable AI <b>- Application Domain:</b> Earth Science, Medical Epidemiology, Biomedical, Weather Forecasting, Bibliographic Network Analysis, Recommendation Systems, etc.	
WORK EXPERIENCE	<b>Korea Institute of Atmospheric Prediction Systems (KIAPS)</b> Research Scientist	October 2021-Present <ul style="list-style-type: none"><li>• Developing intelligent weather prediction models</li><li>• Analyzing the characteristics of weather phenomena</li><li>• Impact analysis of various observation types</li></ul>
EDUCATION	<b>Chung-Ang University</b> , Seoul, Korea M.S., Computer Engineering, March 2019 - February 2021 Thesis: Bibliographic network representation learning for research pattern analytics GPA: 4.3  <b>Myong-Ji College</b> , Seoul, Korea B.S., Computer Engineering, March 2015 - February 2019 GPA: 4.2	
HONORS AND GRANTS	<b>Best Researcher Award</b> , Korea Institute of Atmospheric Prediction Systems (2022) <b>Best Paper Award</b> , Computing4Human 2021 (2021) <b>Best Research Project Award</b> , Center for Women in Science, Engineering, and Technology (2021) <b>Research Assistant</b> , Chung-Ang University (2020) <b>Teaching Assistant</b> , “Introduction to Artificial Intelligence and its Applications,” Chung-Ang University (CAU CE S’20) <b>Teaching Assistant</b> , “Basic Computer Programming,” Chung-Ang University (CAU CE S’19)	
TALKS	<b>Invited talks - The Department of AI at The Catholic Univ. of Korea</b> (March 2025) AI application for weather forecasting  <b>Invited talks - The Department of AI at The Catholic Univ. of Korea</b> (March 2024) Introduction to AI technology for weather forecasting  <b>Invited talks - International Conference on Next Generation Computing</b> (July 2022) Efficient weather forecasting through deep learning based analysis of multi-modal observational data	

1. Daehun Kim\*, **Hyeon-Ju Jeon\***, Hyeyoon Jeong, O-Joun Lee, Hae Gyun Lim: Automated real-time red tide monitoring system using reflected ultrasonic signals and convolutional neural networks. *Engineering Applications of Artificial Intelligence*. (Under review, \*Co-first authors)
2. Van Thuy Hoang, **Hyeon-Ju Jeon**, O-Joun Lee: Mitigating Degree Bias in Graph Representation Learning with Learnable Structural Augmentation and Structural Self-attention. *IEEE Transactions on Network Science and Engineering* 04/2025. (To Appear, **JCR Top 3.3%**)
3. Van Thuy Hoang, Tien-Bach-Thanh Do, Jinho Seo, Seung Charlie Kim, Luong Vuong Nguyen, Duong Nguyen Minh Huy, **Hyeon-Ju Jeon\***, O-Joun Lee\*: Halal or Not: Knowledge Graph Completion for Predicting Cultural Appropriateness of Daily Products. *IEEE Access* 01/2025; 13: 15158-15167. (\*Co-correspondence)
4. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon, O-Joun Lee: Observation Impact Explanation in Atmospheric State Estimation using Hierarchical Message-Passing Graph Neural Networks. *Machine Learning: Science and Technology* 10/2024; 5(4): 045036. (**JCR Top 10.8%**)
5. Yeongho Sung\*, **Hyeon-Ju Jeon\***, Daehun Kim, Min-Seo Kim, Jaeyeop Choi, Hwan Ryul Jo, Junghwan Oh, O-Joun Lee, Hae Gyun Lim: Internal pipe corrosion assessment method in water distribution system using ultrasound and convolutional neural networks. *npj Clean Water* 07/2024; 7: 63. (\*Co-first authors, **JCR Top 1.2%**)
6. **Hyeon-Ju Jeon**, Hyeon-Jin Jeon, Seung Ho Jeon: Predicting the Daily Number of Patients for Allergic Diseases based on Spatiotemporal Graph Convolutional Networks. *Plos One* 06/2024; 19(6): e0304106.
7. Ji Won Nam\*, **Hyeon-Ju Jeon\***, Jeong Eun Lee, O-Joun Lee, Hae Gyun Lim: Quantification of dysnatremia using single-beam acoustic microbeam and convolutional neural networks. *IEEE Sensors Journal* 04/2024; 24(7): 9626-9638. (\*Co-first authors)
8. Jeong Eun Lee\*, **Hyeon-Ju Jeon\***, O-Joun Lee, Hae Gyun Lim: Diagnosis of diabetes mellitus using high frequency ultrasound and convolutional neural network. *Ultrasonics* 01/2024; 136: 107167. (\*Co-first authors, **JCR Top 11.2%**)
9. Van Thuy Hoang, **Hyeon-Ju Jeon**, Eun-Soon You, Yoewon Yoon, Sungyeop Jung, O-Joun Lee: Graph Representation Learning and Its Applications: A Survey. *Sensors* 04/2023; 23(8): 4168.
10. **Hyeon-Ju Jeon**, Jason J. Jung: Discovering the Role Model of Authors by Research History Embedding. *Journal of Information Science* 02/2023; 49(4): 990-1006.
11. **Hyeon-Ju Jeon**, Hae Gyun Lim, K Kirk Shung, O-Joun Lee, Min Gon Kim: Automated cell-type classification combining dilated convolutional neural networks with label-free acoustic sensing. *Scientific Reports* 11/2022; 12: 19873.
12. **Hyeon-Ju Jeon**, Min-Woo Choi, O-Joun Lee: Day-Ahead Hourly Solar Irradiance Forecasting Based on Multi-Attributed Spatio-Temporal Graph Convolutional Network. *Sensors* 09/2022; 22(19): 7179.
13. O-Joun Lee, **Hyeon-Ju Jeon**, Jason J. Jung: Learning Multi-resolution Representations of Research Patterns in Bibliographic Networks. *Journal of Informetrics* 02/2021; 15(1): 101126. (**JCR Top 20%**)

14. **Hyeon-Ju Jeon**, O-Joun Lee, Jason J. Jung: Is performance of scholars correlated to their research collaboration patterns? *Frontiers in big Data* 11/2019; 2(39).

## Conference

1. **Hyeon-Ju Jeon**, Hyeon-Jin Jeon, Seong Ho Jeon (2025). Micro- and Macro-View Graph Structure Learning for Forecasting Allergic Disease Case Counts under Air Pollution Exposure. in *Proceedings of the Conference on Information and Knowledge Management (CIKM 2025)*. (Under Review)
2. Raeseol Park, **Hyeon-Ju Jeon**, Dae-Hyun Sun, et al (2025). Pioneering Adaptive Strategies for Korea Integrated Model in the Face of Climate Change. in *Proceedings of the 2025 Annual Seminar of the European Centre for Medium-Range Weather Forecasts* (ECMWF Annual Seminar 2025), Bonn, Germany; April 2025.
3. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon, O-Joun Lee (2024). Explainable Graph Neural Networks for Observation Impact Analysis in Atmospheric State Estimation. in *Proceedings of the Workshop on Explainable machine learning for sciences (XAI4Sci 2024)*, co-located with the 38th Annual AAAI Conference on Artificial Intelligence (AAAI 2024), Vancouver, Canada; February 2024.
4. Jeong Eun Lee, **Hyeon-Ju Jeon**, O-Joun Lee, Hae Gyun Lim (2023). Blood Glucose Classification Using high-Frequency Ultrasound and Artificial Intelligence. in *Proceedings of the 2023 IEEE International Ultrasonics Symposium* (IEEE IUS 2023), Montreal, Canada; September 2023.
5. Ji Won Nam, **Hyeon-Ju Jeon**, Jeong Eun Lee, O-Joun Lee, Hae Gyun Lim (2023). Classification of Red Blood Cells for the Diagnosis of dysnatremia Based on Ultrasound and Convolutional Neural Networks. in *Proceedings of the 2023 IEEE International Ultrasonics Symposium* (IEEE IUS 2023), Montreal, Canada; September 2023.
6. Jeong Eun Lee, **Hyeon-Ju Jeon**, O-Joun Lee, Hae Gyun Lim (2023). High-frequency ultrasound and convolutional neural network: A Potential tool for diagnosis of diabetes mellitus. *Samsung Global Technology Symposium*, Seoul, Korea; April 2023.
7. Hui-Nae Kwon, **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon, and Seon Ki Park (2023). Bias correction of aircraft temperature observations in the Korean Integrated Model based on a deep learning approach. in *Proceedings of the EGU General Assembly 2023* (EGU 2023), Vienna, Austria; April 2023, EGU23-12218.
8. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon (2023). Estimating the observation impact based on attentive 3d-convolutional RNN. in *Proceedings of the 24th International TOVS Study Conference* (ITSC 2023), Tromso, Norway; March 2023.
9. Eun-jin Kim, **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon (2023). A Study on Machine Learning-Based Quality Control Techniques for the Satellite Radiance Data Assimilation. in *Proceedings of the 24th International TOVS Study Conference* (ITSC 2023), Tromso, Norway; March 2023.
10. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon (2022). What Meteorological Characteristics Do Affect Weather Forecasts? in *Proceedings of the 3rd International Conference on Human-centered Artificial Intelligence* (Computing4Human 2022), Hanoi, Vietnam; December 2022.

11. Nam D Vo, O-Joun Lee, Khac-Hoai Nam Bui, Hae Gyun Lim, **Hyeon-Ju Jeon**, Phuong-Mai Nguyen, Jin-Taek Kim, Bui Quang Tuyen, Jason J Jung, Thuy Anh Vo (2021). Computing4Human 2021: *The 2nd International Conference on Human-centered Artificial Intelligence. The 2nd International Conference on Human-centered Artificial Intelligence* (Computing4Human 2021), Da Nang, Vietnam; October 2021. (**Editorial**)
12. **Hyeon-Ju Jeon**, Gyu-Sik Choi, Se-Young Cho, Hanbin Lee, Hee Yeon Ko, Jason J Jung, O-Joun Lee, Myeong-Yeon Yi (2021). Learning Contextual Representations of Citations via Graph Transformer. *in Proceedings of the 2nd International Conference on Human-centered Artificial Intelligence* (Computing4Human 2021), Da Nang, Vietnam; December 2021.
13. **Hyeon-Ju Jeon**, O-Joun Lee, Jason J. Jung (2019). Is Performance of Scholars Correlated to their Research Collaboration Patterns? *in Proceedings of the 6th Workshop on Big Scholarly Data (BigScholar 2019), co-located with the 28th ACM International Conference on Information and Knowledge Management (CIKM 2019)*, Beijing, China; November 2019.

### Pre-print

1. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon, O-Joun Lee: Explainable Graph Neural Networks for Observation Impact Analysis in Atmospheric State Estimation. arXiv preprint 03/2024; arXiv:2403.17384. (Preprint)
2. **Hyeon-Ju Jeon**, Jeon-Ho Kang, In-Hyuk Kwon, O-Joun Lee: CloudNine: Analyzing Meteorological Observation Impact on Weather Prediction Using Explainable Graph Neural Networks. arXiv preprint 02/2024; arXiv:2402.14861. (Preprint)

### Patent

1. Jason J. Jung, **Hyeon-Ju Jeon** (2023). Explainable role model recommendation method and apparatus thereof, NO. 10-2021-0029267, issued June 2023.

### RESEARCH PROJECT

### Principal Investigator

- Development of GNN-Based Citation Context Extraction and Analysis System for Intelligent Knowledge Information Services (2021/05/01 – 2021/10/31), Supported by the Women In Science, Engineering and Technology (WISET) grant funded by the Korea government (MSIT), **Best Research Project Award**.
- Explainable Recommendation Service based on Graph Embedding by Processing Academic Big Data (2020/05/01 – 2020/10/31), Supported by the Women In Science, Engineering and Technology (WISET) grant funded by the Korea government (MSIT).
- Social data modeling for resolving differences in perceptions of online users (2020/06/01 – 2020/11/30), Supported by the Korea Institute of Human Resources Development in Science and Technology (KIRD) grant funded by the Korea government (MSIT).

### TEACHING EXPERIENCE

### LG CNS

2021-2022

Lecturer in Database Modelling Methodologies and Practices

- Developed and conducted lectures and facilitated hands-on exercises
- Provided one-on-one feedback on practical application in real-world scenarios

**Chung-Ang University**

Spring 2020

Teaching Assistant in Introduction to Artificial Intelligence and its Applications

- Attended class while observing learning and teaching throughout course
- Assisted students with assignments and material comprehension

**Chung-Ang University**

Spring 2019

Teaching Assistant in Basic Computer Programming

- Graded weekly assignments and moderated questions and answers at the end of class
- Developed lesson plan and lead programming class sessions

**SKILLS AND ABILITIES**

Programming: Python, Java, C, JSP, JavaScript  
Machine Learning Frameworks: Pytorch, TensorFlow, JAX  
Database: Oracle, Neo4j  
Operation Systems: Linux, Windows  
Language: Korean, English, Chinese