HAEIN JEON

Ph.D. in Artificial Intelligence (she/her)

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RESEARCH PROFILE

I am a researcher in natural language processing, investigating how linguistic structure is represented in large language models and how computational methods can support language learning.

EDUCATION

Ph.D.: Artificial Intelligence, 02/2026
Kyungpook National University - Daegu, Korea
Ph.D. Thesis: "Adaptive Intelligent Tutoring Systems through Pedagogical Knowledge Augmented Prompting," Kyungpook National University, December 2025. (Supervised by Prof. Bo-Yeong Kang)

M.S.: Artificial Intelligence, 02/2022
Kyungpook National University - Daegu, Korea
M.S. Thesis: "Deep Reinforcement Learning with Voice Feedback for a Table Balancing Robot," Kyungpook National University, December 2021. (Supervised by Prof. Bo-Yeong Kang)

B.A.: English Education, 02/2020
Kyungpook National University - Daegu, Korea
(Supervised by Prof. Yae-Shiek Lee)

SELECTED PAPERS AND PREPRINTS

Language, Learning, and Human-Centered AI

- **Haein Jeon** and Bo-Yeong Kang, "Leveraging Large Language Models for Adaptive Tutoring Systems via Pedagogical Knowledge-Augmented Prompting,"
  Expert Systems with Applications, vol. 332(A), 2026, Article 133414. (SCIE, Q1, IF 9.4.)
- **Haein Jeon**, "Probing Native-Language Signals in Learner English Representations,"
  Under review, ACL Rolling Review, May 2026.
- **Haein Jeon**, Dae-Won Kim, and Bo-Yeong Kang,
  "Deep Reinforcement Learning for Cooperative Robots Based on Adaptive Sentiment Feedback,"
  Expert Systems with Applications, vol. 243, 2024, Article 121198. (SCIE, Q1, IF 9.4.)
- **Haein Jeon**, Yewon Kim, and Bo-Yeong Kang,
  "Interactive Reinforcement Learning for Table Balancing Robot,"
  In *Proceedings of the Second International Combined Workshop on Spatial Language Understanding and Grounded Communication for Robotics*,
  co-located with ACL-IJCNLP 2021, Virtual Conference, August 2021.
- Yewon Kim, **Haein Jeon**, and Bo-Yeong Kang,
  "Interactive Robot-Robot Reinforcement Learning for Object Balancing Task,"
  In *Proceedings of the 42nd IEEE International Conference on Consumer Electronics (ICCE 2024)*,
  Las Vegas, USA, January 2024.

Machine Learning and Applied AI

- **Haein Jeon**, Donghun Lee, Bo-Yeong Kang, and Jimin Oh,
  "Bridging Data-Rich and Data-Poor Domains in Lithium-Ion Batteries Using SEM Data via CNN Transfer Learning,"
  In *AI for Accelerated Materials Discovery Workshop (AI4Mat)*, co-located with NeurIPS 2025, San Diego, USA, December 2025.
- **Haein Jeon**, Donghun Lee, Bo-Yeong Kang, and Jimin Oh,
  "Transfer Learning Framework for SEM-Based Degraded Lithium-ion Battery Diagnostics under

Domain Shift and Data Scarcity,"
Journal of Power Sources, *in revision*.

- Eunbin Noh, **Haein Jeon**, Jinseo Kim, Chanyoung Lee, Junhwan Yu, Bo-Yeong Kang, and Jimin Oh, *"SEM image-based classification of manufacturing-induced microstructural evolution in Ni-rich cathodes,"*
International Journal of Energy Research, Accepted on 15 July 2026.
- Hye-Won Kim, **Haein Jeon**, Soo-Young Byun, Soo-Min Ji, Bo-Yeong Kang, and Ji-Young Lim, "Unsupervised Clustering-Based Analysis of Media Diaries of Adolescents and Segmentation of Media Literacy Education,"
Proceedings of the Fall Conference of the Korean Home Economics Association, October 2024.
- **Haein Jeon**, Jeonghun Kang, and Bo-Yeong Kang,
"*Deep Reinforcement Learning-Based Cooperative Robot Using Facial Feedback*,"
Journal of Korea Robotics Society, vol. 17, no. 3, pp. 264–272, September 2022. (KCI)
- Ruchitha Gangula, Hammed Obasekore, **Haein Jeon**, and Bo-Yeong Kang,
"Real-time Monitoring System for Industrial Worker Emotion State Using Vision Transformer-based Facial Expression Analysis,"
The 62nd Winter Academic Conference of Korea Industrial Hygiene Association, February 2026.

PROJECTS

- **Calibrating Physics Education with Misconception-Tuned Lightweight LLM,**
Core Research Grants (Type B) / New Basic Research Projects, Ministry of Science and ICT (MSIT), Apr. 2026 – Feb. 2030. *(Research Associate)*
- **Digital Twin and ML-Based Battery-BMS Performance and Safety Optimization,**
Basic Research Lab Support Program, Ministry of Science and ICT (MSIT), Apr. 2026 – Present.
(Postdoctoral Researcher)
- **Comparative Analysis of Adolescent Media Diaries Using Unsupervised Learning**,
Graduate Student Autonomous Research Program,
Apr. 2024 – Feb. 2025.
- **Evolutionary Cooperative Robot Development Using Distributed Deep Reinforcement Learning**,
Mid-career Research Project, Ministry of Science and ICT (MSIT),
Mar. 2019 – Feb. 2022. *(Research Assistant)*

RESEARCH EXPERIENCES

ESSL Postdoctoral Researcher | Apr. 2026 – Present | **Kyungpook National University**
Artificial Intelligence Robot Lab Researcher | Jan 2020 – Feb 2026 | **Kyungpook National University**
Technical Consultant– Vision-Based Tool Lifetime Estimation | July 2025 – October 2025 | **CHAMPDIA**
Outsourced Researcher– Robot Vision-Based Joint Tracking Project | July 2025 – August 2025 | **MDX**
Undergraduate Research Assistant | Educational NLP | 2019 | **Kyungpook National University**

TEACHING EXPERIENCES

- **Lecturer**, Kyungpook National Univ. (KNU): Human and Artificial Intelligence (Fall 2025) [*Slides*]
- **Teaching Assistant**, KNU: AI Design, Human and Artificial Intelligence, C/C++ Programming, Engineering Mathematics I & II (2022 Spring–2024 Fall)
- **Student Teacher**, Wolsoe Middle School: English Teaching Practicum (May 2019)

PROFESSIONAL ACTIVITIES

Reviewer

- **Expert Systems with Application** *(SCIE)*, 2026
- **The Journal of Supercomputing** *(SCIE)*, 2025
- **Journal of Korea Robotics Society** *(KCI)*, 2023–2024

Committee & Evaluation Service

- External Interview Panel Member for the Selection of Robot Companies for the AI Care Robot Public Project, Uiseong County Office, Gyeongbuk, Korea, February 24, 2023.

Invited Talk

- **"Basic Principles and Future Directions of Artificial Intelligence"**, COLLEGE OF SOCIAL SCIENCES, Kyungbook National University, Daegu, South Korea

PATENT

- **Haein Jeon** and Bo-Yeong Kang
  "Method and Apparatus for Adaptive Intelligent Tutoring Based on Pedagogical Knowledge-Augmented Prompts"
  Korean Patent Application No. 10-2026-0081263, filed May 6, 2026.
- Bo-Yeong Kang, **Haein Jeon**, and Yewon Kim,
  "Method of Interactive Reinforcement Learning for Table Balancing Robot, Recording Medium, and Device for Performing the Method,"
  Korean Patent **No. 10-2814408**, Registered May 26, 2025.
  (Application No. 10-2022-0011771, filed July 29, 2021)
- Bo-Yeong Kang, **Haein Jeon**, and Jeonghun Kang,
  "Deep Reinforcement Learning-Based Cooperative Robot and Method Using Facial Expression Feedback,"
  Korean Patent **No. 10-2776109**, Registered February 27, 2025.

SOFTWARE REGISTRATION

- Haein Jeon, Bo-Yeong Kang
  "PATS: Pedagogically Adaptive Tutoring System."
  Software Registration **No. C-2026-027623**, June 5, 2026
- Hammed Olatunde Obasekore, **Haein Jeon**, Woonghee Tae, Youngmin Kim, and Bo-Yeong Kang,
  "Robot Action Learning System for Manipulator Joint Coordinate Tracking,"
  Software Registration **No. C-2025-040639**, October 2, 2025.
- **Haein Jeon**, Yewon Kim, and Bo-Yeong Kang,
  "Interactive Reinforcement Learning System for Table Balancing Robot Using Voice Feedback,"
  Software Registration **No. C-2025-025436**, July 8, 2025.

SKILLS

Programming & Frameworks	Python (Proficient), MATLAB, PyTorch, Hugging Face Transformers, scikit-learn, pandas, NumPy.
AI Expertise	NLP & LLMs (System Design, Evaluation, Integration), Deep Reinforcement Learning, Continual Learning, ML/DL.
Tools & Design	Matplotlib, IBM SPSS, Data Analysis (Supervised/Unsupervised Learning), Rhino, Fusion 360.
Languages	Korean (Native), English (Proficient; TOEFL iBT 94)
Teacher's Certificate	Secondary School Teacher (GradeII) of English

SCHOLARSHIPS

- 2020.03 – 2022.03, Tuition Scholarship
- 2020.09– 2022. 09, Professional Manpower Training for 3D Printing based on 3D Printing Materials
- 2021.03 – 2023.08, BK21 FOUR: AI Convergence Innovation Talent Training Program
- 2022.09 – 2023.09, Scholarship for Academic Excellence
- 2023 Autumn Semester, Teaching Assistant Scholarship
- 2025.01 KNU Women's Faculty Association Scholarship (KRW 1,000,000)