

Curriculum Vitae

Joo Hyun Lee, R.N., M.S.
Research Scientist

Contact

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Links

[GitHub](#), [LinkedIn](#), [Homepage](#), [Google Scholar](#)

Skills & Experiences Summary

- Experience in **machine learning, deep learning modeling and optimization** for diverse **medical data**, including X-ray, electronic medical records, and video data using Python, and Pytorch.
- Experience with government **project management, proposal writing, and report writing**.
- 2+ years of experience in **research** experience and master's degree in **biomedical system informatics**, including **study design, manuscript writing, revision, statistical analysis, deep learning, machine learning, and presentation in seminars**.
- Experience in **designing and conducting RCT** (Randomized Controlled Trials) for **digital therapeutics**, including establishing statistical analysis plans and performing statistical analysis. Proficient in manuscript writing based on research findings.
- Experience in **data collection and pre-processing pipeline** for machine learning model management.
- 1.5+ years of experience in **public health and community nursing**, including providing health education to local health department staff and community members, planning, and implementing infectious disease prevention programs, leading environmental improvement projects at local health centers, managing, and supervising primary health care facilities, and coordinating and participating in community health events.
- 3.5+ years of **ICU nursing experience**, including experience in critical care medicine, patient management, ventilator care, CRRT and ECMO nursing and the provision of specialized care and management of complex patient conditions in a high-acuity environment.
- Experience in **nursing** care for patients with **infectious diseases** such as MERS (Middle East Respiratory Syndrome) and COVID-19.
- 1+ year of experience in **orthopedic surgery ward nursing**, providing patient care and support in a specialized medical setting.

Education Background

Mar. 2022 ~ **M.S.** in Biomedical Systems Informatics,
Feb. 2024 Yonsei University, Seoul, KR
Advisor: Professor Yu Rang Park

Mar. 2016 ~ **B.S.** in Nursing,
Feb. 2017 Seoul Women's College of Nursing, Seoul, KR

Mar 2010 ~ **Associate degree** in Nursing,
Feb. 2013 Seoul Women's College of Nursing, Seoul, KR

Representative Publications

1. **(Thesis) Lee JH**, Development and validation of a social interaction based deep learning system to predict the severity of social skill in autism spectrum disorder
2. **(First author) Lee JH***, Lee TS*, Yoo SY, et al. Metaverse-based social skills training programme for children with autism spectrum disorder to improve social interaction ability: an open-label, single-centre, randomised controlled pilot trial. *eClinicalMedicine*. 2023;61:102072. doi:10.1016/j.eclinm.2023.102072
3. **(First author) Lee, J.**, Lee, T. S., Lee, S., Jang, J., Yoo, S., Choi, Y., & Park, Y. R. (2022). Development and application of a metaverse-based social skills training program for children with autism spectrum disorder to improve social interaction: Protocol for a randomized controlled trial. *JMIR research protocols*, 11(6), e35960.
4. **(First author) Kim, H. H.***, **Lee, J.***, Kim, H. H., Hwang, S., Yi, I., Kao, S., ... & Park, Y. R. (2022). Digital Device Exposure and Cognition Levels of Children in Low-and Middle-Income Countries: Cross-sectional Study in Cambodia. *Journal of Medical Internet Research*, 24(8), e31206.

Professional Experience

Jul. 2021 ~ Feb. 2024	Research Scientist Department of Biomedical System Informatics Yonsei University College of Medicine <i>Advisor: Professor Yu Rang Park</i>	Seoul, KR
Mar. 2021 ~ Jul. 2021	Researcher (Intern) R&D team, Dobrain	Seoul, KR
Dec. 2020 ~ Feb. 2021 ~	Registered Nurse COVID-19 ward, National Medical Center	Seoul, KR
Jun. 2018 ~ Mar. 2020	Registered Nurse, Volunteer Department Health Region of La Paz Korea International Cooperation Agency (KOICA)	La Paz, HN
Jun. 2014 ~ Feb. 2018	Registered Nurse Intensive Care Unit (ICU), Seoul Medical Center	Seoul, KR
Mar. 2013 ~ Apr. 2014	Registered Nurse Orthopedics Surgery ward, Gachon University Gil Hospital	Incheon, KR

Project Experience

- **Development of digital therapeutics (DTx) on social interaction skills of patients with autism spectrum disorder (2022.04 ~ 2024.02)**
 - ▶ Funded by the Institute of Information & Communications Technology Planning & Evaluation (IITP), Korean Government (MSIT)
 - ▶ Role: Principal researcher
 - Design and conduct a pilot RCT study to determine the feasibility of a metaverse-based social

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interaction skill enhancement program

- Design RCT study a metaverse-based social interaction skills enhancement program
- Establish a protocol for collecting video and smartwatch-based biometric data on children with ASD to build AI model
- Developed an AI model to predict social cognitive abilities of children with ASD using multi-modal deep learning technology by utilizing facial and body, voice information, and smartwatch-based biometric data

- **Development and clinical validation of digital therapeutics for problematic behavior in children with autism (2022.04 ~ 2023.03)**

- ▶ Funded by the ICT R&D program of Institute of Information & Communications Technology Planning & Evaluation (IITP), Korean Government (MSIT)
- ▶ Role: Researcher
 - Designed a mobile assisted parent training program to reduce problem behaviors in children with autism using mobile
 - Developed an ABA-based parent training program for mobile apps
 - Participated in the development of parent training program apps
 - Conducted RCT study design, statistical analysis, and manuscript writing

- **Artificial Intelligence Learning Data Construction Project: Construction of Infant Behavior Video Data (2021.03 ~ 2021.12)**

- ▶ Funded by National Information Society Agency (NIA)
- ▶ Role: Researcher
 - Establish a data collection process
 - Conducted data quality control
 - Building data pre-processing pipelines, pre-processing and de-identifying data

Awards

- **Excellent Academic Paper award (2024)**, The Graduate School, Yonsei University
 - ▶ “Metaverse based social skills training programme for children with autism spectrum disorder to improve social interaction ability: an open label, single centre, randomised controlled pilot trial.”
- **Yonsei Digital Healthcare Cybersecurity Competition – 3rd (2023)**
 - ▶ Synthetic Data Medical Validity Assessment: Evaluation of Medical Validity in Colorectal Cancer Clinical Synthetic Data and Enhancement through Data-Model based Ensemble
- **Medical Image Processing Competition – 3rd (2022)**
 - ▶ Rayence Inc: Detecting lung field and heart regions in chest X-ray image

Publications

1. **(First author) Lee JH***, Lee TS*, Yoo SY, et al. Metaverse-based social skills training programme

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for children with autism spectrum disorder to improve social interaction ability: an open-label, single-centre, randomised controlled pilot trial. [eClinicalMedicine](#). 2023;61:102072. doi:10.1016/j.eclinm.2023.102072

2. **(First author)** Kim, H. H.*, **Lee, J.***, Kim, H. H., Hwang, S., Yi, I., Kao, S., ... & Park, Y. R. (2022). Digital Device Exposure and Cognition Levels of Children in Low-and Middle-Income Countries: Cross-sectional Study in Cambodia. [Journal of Medical Internet Research](#), 24(8), e31206.
3. **(First author)** **Lee, J.**, Lee, T. S., Lee, S., Jang, J., Yoo, S., Choi, Y., & Park, Y. R. (2022). Development and application of a metaverse-based social skills training program for children with autism spectrum disorder to improve social interaction: Protocol for a randomized controlled trial. [JMIR research protocols](#), 11(6), e35960.
4. **(Co-author)** Chun, S., Jang, S., Kim, J. Y., Ko, C., **Lee, J.**, Hong, J., & Park, Y. R. (2024). Comprehensive Assessment and Early Prediction of Gross Motor Performance in Toddlers With Graph Convolutional Networks–Based Deep Learning: Development and Validation Study. [JMIR Formative Research](#), 8, e51996.
5. **(Co-author)** Kim, H. H., Kim, J. Y., Jang, B. K., **Lee, J. H.**, Kim, J. H., Lee, D. H., ... & Park, Y. R. (2023). Multiview child motor development dataset for AI-driven assessment of child development. [GigaScience](#), 12, giad039.
6. **(Co-author)** Hee Min Yang, **Joo Hyun Lee**, Yu Rang Park. Develop Method To Efficiently Apply Image-Based Facial Emotion Classification Models To Video Data. [EAI MobiHealth 2023](#), Portugal
7. **(First author)** **Lee JH***, Lim JH*, Kang S, Kim S, Jung SY, Kim S, Hong SB, Park YR. (2023). Mobile assisted Parent Training Intervention for Behavioral Problems in Children with Autism Spectrum Disorder: A Randomized Clinical Trial. [Journal of Medical Internet Research](#), Preprints. 29/08/2023:52295 (*Under Review*)
8. **(First author)** Kim HH*, **Lee J***, Kim JH, Beck SS, Park YR. (2023). To identify key indicators and priority projects for promoting the dissemination of digital health. [Health Policy and Technology](#) (*Under Review*)
9. **(First author)** **Lee, JooHyun*** and Ko, Chanyoung* and Jae Seong, Hong* and Hong, Soon-Beom* and Kang, Soyeon and Seo, DongHyeok and Park, Yu Rang (2024), Development and Validation of a Social Interaction Based Deep Learning System for Predicting the Severity of Social Skills in Autism Spectrum Disorder. [JMIR Pediatrics and Parenting](#) (*Under Review*)