# Sarah (Hyojin) Lee

Suwon-si, Gyeonggi-do, Republic of Korea
+82 10-4028-1829 sarahhyojin@snu.ac.kr linkedin.com/in/sarahhyojin website github.com/sarahhyojin

## Professional Summary

**Machine Learning Engineer** at Samsung Electronics (Digital Health Team) with expertise in developing time-series models for healthcare applications. Research focuses on sleep health, including algorithms for sleep apnea detection and sleep staging, as well as foundation models for wearable sensor data and diverse health-related downstream tasks. Active collaborator in Samsung-sponsored research with the MIT Media Lab on sleep projects. Holds a **Master's degree in Data Science from Seoul National University**, with research under Prof. Hyung-Sin Kim and co-advisor Prof. Hyun-Woo Shin, combining strong technical expertise with interdisciplinary insight for real-world clinical deployment of **AI in healthcare**. Academic background includes a **Bachelor's degree in Biology and Business Administration**, providing both biological knowledge and leadership skills for independent research.

## Publications

**Per-Second, Explainable Obstructive Sleep Apnea Detection from Multimodal Time-Series using Vision Transformer (*Under Review*)**

*Joopyo Hong, Kunmin Jang, **Hyojin Lee**, Hyun Keun Ahn, Hyun-Woo Shin and Hyun-Sin Kim*

- Contributed to the conceptualization of ***VOSA*** architecture, reviewed the data, and participated in writing the manuscript.

**Explainable Vision Transformer for Automatic Visual Sleep Staging on Multimodal PSG Signals (*npj Digital Medicine*, 2025)**

***Hyojin Lee***, You Rim Choi*, Hyun Kyung Lee*, Jaemin Jeong, Joopyo Hong, Hyun-Woo Shin, Hyung-Sin Kim*

- First-authored a paper introducing ***SleepXViT***, a novel automatic sleep staging system using Vision Transformer (ViT) that provides intuitive, consistent explanations by mimicking human visual scoring.
- The model offers well-calibrated confidence scores, with high-resolution heatmaps highlighting essential features of PSG signals.
- Proposed a reliable and interpretable sleep staging model, demonstrating state-of-the-art performance across multiple baselines.

**SlAction: Non-intrusive, Lightweight Obstructive Sleep Apnea Detection using Infrared Video (*ICCV Workshop*, 2023)**

*You Rim Choi, Gyeongseon Eo, Wonhyuck Youn, **Hyojin Lee**, Haemin Jang, Dongyoon Kim, Hyun-Woo Shin, Hyung-Sin Kim*

- Contributed to the paper by conducting exploratory data analysis and providing insights for manuscript writing. Our collaborative work has been accepted for presentation at the 2023 ICCV CVAMD workshop.

## Experience

**Samsung Electronics** — **May 2024 – Present**
*Machine Learning Engineer, Digital Health Team* — *Suwon, South Korea*

- Develop machine learning algorithms for sleep apnea detection and automatic sleep staging from wearable signals.
- Design and implement health foundation models to enable diverse downstream tasks in digital health.
- Collaborate with product teams to support real-world deployment of ML models in mobile phone and wearable devices.
- Participate in Samsung–MIT Media Lab joint research, contributing to the commercialization of sleep projects.

**Carpenstreet Inc.** — **Jan 2020 – Mar 2022**
*Product Manager* — *Seoul, South Korea*

- Collaborated with a cross-functional team and led the launch of new features and products at a 3D open-source platform startup.
- Managed and prioritized multiple projects aligned with product-market fit and business goals.
- Conducted UX research, analyzing both qualitative and quantitative data to inform design and product decisions.

## Education

**Seoul National University** — **Mar 2022 – Feb 2024**
*M.S. in Data Science* — *Seoul, South Korea*

- Member of AIoT Lab (Advisor: Prof. Hyung-Sin Kim)
- Research topic: Developing an explainable sleep staging model using PSG image dataset
- Coursework: Machine Learning/Deep Learning, Big Data and Knowledge Management, Computing, Ambient AI for Medical Applications, etc.
- Teaching Assistant: Computing - Led lab sessions and practice exercises in Python and C++, guiding students through coding assignments and problem-solving.

**Seoul National University** — **Mar 2016 – Aug 2022**
*B.S. in Biology and B.A. in Business Administration (Double Major)* — *Seoul, South Korea*

- Worked as an intern at Laboratory of Plant Chromatin Biology (Advisor: Prof. Yoo-Sun, Noh)
- Participated in a shoot regeneration project using *Arabidopsis*, contributing to gene knock-out, callus cultivation, and DNA extraction.

## Skills

**Programming**: Proficient in Python, Experience in C/C++, JAVA, SQL
**Framework**: Proficient in Pytorch and Tensorflow
**Languages**: Native in Korean, Fluent in English