

SEO-YOON MOON

mrn538@snu.ac.kr ◇ <https://symoon9.github.io/>

EDUCATION

Seoul National University , <i>College of Liberal Studies</i> <i>B.S. in Computer Science & Engineering</i> <i>B.S. in Cognitive Neural Computation (student-designed major)</i>	Mar 2019 - Aug 2024 (Expected) Seoul, Korea
University of Washington <i>Exchange Student</i>	Mar 2023 - Jun 2023 Seattle, WA

PUBLICATIONS

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- S. Moon**, E. Weinberger, S. Lee, **Towards scalable embedding models for spatial transcriptomics data**, *Machine Learning in Computational Biology*, 2023. [\[paper\]](#)[\[video\]](#)
- S. Moon***, H. Wang*, H. Kim, K. Kim, W. Ahn, Y. Y. Joo, J. Cha, **Early Life Stress Modulates the Genetic Influence on Brain Structure and Cognitive Function in Children**, *Heliyon*, 2023. (in press)
- Y. Y. Joo, **S. Moon**, H. Wang, H. Kim, E. Lee, J. H. Kim, J. Posner, W. Ahn, I. Choi, J. Kim, J. Cha, **Association of genome-wide polygenic scores for multiple psychiatric and common traits in preadolescent youths at risk of suicide**, *JAMA network open*, 2022. [\[paper\]](#)
- K. Kim, Y. Y. Joo, G. Ahn, H. Wang, **S. Moon**, H. Kim, W. Ahn, J. Cha, **The sexual brain, genes, and cognition: A machine-predicted brain sex score explains individual differences in cognitive intelligence and genetic influence in young children**, *Human Brain Mapping*, 2022. [\[paper\]](#)
- J. Suh, J. Kim, E. Lee, J. Kim, D. Hwang, J. Park, J. Lee, J. Park, **S. Moon**, Y. Kim, M. Kang, S. Kwon, E. Choi, W. Rhee, **Learning ECG Representations for Multi-Label Classification of Cardiac Abnormalities**, *Computing in Cardiology*, 2021. [\[paper\]](#)

* : equal contribution

POSTER & ABSTRACTS

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- S. Moon**, E. Weinberger, S. Lee, **Scalable embedding model for spatially-resolved transcriptomics data**, *Allen School Undergraduate and Master's Research Showcase*, 2023, Poster Presentation. [\[poster\]](#)
- H. Wang, **S. Moon**, Y. Y. Joo, E. Lee, J. Cha, **Genes, Early Life Stress, Brains, and Cognition: A Moderated Mediation Analysis**, *Biological Psychiatry*, 2021, Poster Presentation. [\[abstract\]](#)

RESEARCH EXPERIENCE

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- | | |
|--|------------------------------------|
| AI for Biomedical Sciences Lab , School of Computer Science and Engineering, UW
<i>Undergraduate Researcher (Advisor: Su-In Lee)</i> | Mar 2023 - Oct 2023
Seattle, WA |
|--|------------------------------------|
- Developed scalable graph neural network for spatial transcriptomics
- | | |
|---|-------------------------------------|
| Connectome Lab , Department of Psychology, SNU
<i>Undergraduate Researcher (Advisor: Jiook Cha)</i> | Jun 2020 - Dec 2022
Seoul, Korea |
|---|-------------------------------------|
- Designed and conducted a moderated mediation analysis to investigate the impact of early life stress on children's genes, brain, and cognitive function. Generated genome-wide polygenic score via PRSice-2 for 25 phenotypes.
 - Designed and conducted machine learning experiments to investigate the correlation between DNA and suicidality

Artificial Society, Startup Company
AI Researcher (Part-time)

Mar 2022 - Jul 2022
Seoul, Korea

- Trained deep learning model for detecting facial landmarks on mobile devices, created metric for evaluating attention levels while reading, as a part of developing a mobile application for dyslexic people.

Applied Data Science Lab, Department of Intelligence and Information, SNU
Undergraduate Researcher (Advisor: Wonjong Rhee)

Jul 2021 - Aug 2021
Seoul, Korea

- Extracted features using Fourier transformations to catch peaks and calculate the entropy from biosignal data
- Conducted deep learning experiments using Transformers and CNNs to predict cardiovascular disease from ECG data

PROJECTS

Digital Barrier Free

Jan 2023 - Present

- Led developing Chrome extension for blinded and low-vision people
- Employed optical character recognition (OCR) and image captioning to accommodate enhanced web accessibility to visually impaired people

Data Augmentation Using Feature Attribution in NLP

Sep 2022 - Dec 2022

- Refined Cutoff algorithm (Shen, 2020) using Layer-wise Relevance Propagation (LRP) based feature attribution

Web Project for Real-time Weather Tweets (NowSee)

Sep 2022 - Dec 2022

- Developed an idea of a real-time weather community
- Designed UI & UX and developed front-end (React) and back-end (Django) features

SNU Fast MRI Challenge

Jul 2021 - Aug 2021

- Preprocessed fMRI k-space data and developed MRI super-resolution model using U-Net, CNN, and Vision Transformer to generate full MRI images from under-sampled MRI

SCHOLARSHIP & AWARDS

Forest of Talent, Korea Foundation for Advanced Studies

Mar 2022 - Feb 2024

- Training program for future leaders (\$4,000 for scholarship and \$8,000 for the 1-year project)

Undergraduate Scholarship, Korea Foundation for Advanced Studies

Sep 2020 - Feb 2022

- Total \$6,000 of scholarship

LEADERSHIP, MENTORING & OUTREACH

Brain Cognitive Science Community

Sep 2021 - Jun 2022

- Organized and participated study groups Reading and the brain ([poster](#)) and Synesthesia and cross-modality

Woori Narae, Student Association for Volunteer Tutoring North Korean Defectors

Mar 2019 - Feb 2021

- Formal president (Mar 2020 - Feb 2021), tutored mathematics and English to three students

Volunteer work at Siloam Center for The Blind

Jan 2020

- Participated in making digital books for the blinds

SKILLS

Computer Languages

Python, R, C, Java, JavaScript

Frameworks

Pytorch, Scikit-learn, Huggingface, PyTorch Geometric, React, Django

Data Processing

ECG, Spatial Transcriptomics, fMRI, Natural Language, Image, GWAS

Mathematics

Multivariate Calculus, Linear Algebra, Differential Equations