SEO-YOON MOON

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EDUCATION

Seoul National University, *College of Liberal Studies* — Mar 2019 - Aug 2024 (Expected)
B.S. in Computer Science & Engineering — *Seoul, Korea*
B.S. in Cognitive Neural Computation (student-designed major)

University of Washington — Mar 2023 - Jun 2023
Exchange Student — *Seattle, WA*

POSTER & ABSTRACTS

S. Moon, E. Weinberger, S. Lee, **Towards scalable embedding models for spatial transcriptomics data**, *Machine Learning in Computational Biology*, 2023, Poster Presentation. [abstract]

S. Moon*, E. Weinberger*, S. Lee, **Scalable embedding model for spatially-resolved transcriptomics data**, *Allen School Undergraduate and Master's Research Showcase*, 2023. [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]

PUBLICATIONS

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]

(Preprint) **S. Moon***, H. Wang*, H. Kim, K. Kim, W. Ahn, Y. Y. Joo, J. Cha, **The Impact of Early Life Stress on the Genetic Influence on Brain and Cognitive Development in Children**, *medRxiv*, 2021. [paper]

$*$: equal contribution

RESEARCH EXPERIENCE

AI for Biomedical Sciences Lab, School of Computer Science and Engineering, UW — Mar 2023 - Present
Undergraduate Researcher (Advisor: Su-In Lee) — *Seattle, WA*

- Developed scalable graph neural network for spatial transcriptomics

Connectome Lab, Department of Psychology, SNU — Jun 2020 - Dec 2022
Undergraduate Researcher (Advisor: Jiook Cha) — *Seoul, Korea*

- Calculated Genome-wide polygenic score via PRSice-2 for 25 phenotypes
- Designed and conducted machine learning experiments to investigate the correlation between DNA and suicidality
- Conducted moderated mediation analysis via structural equation model to investigate the impact of early life stress on children's intelligence score

Artificial Society, Startup Company — Mar 2022 - Jul 2022
AI Researcher (Part-time) — *Seoul, Korea*

- Developed deep learning model for detecting face landmarks while reading an article on mobile devices
- Developed metric for evaluating concentration level while reading when people with difficulties in reading read text through mobile devices

Applied Data Science Lab, Department of Intelligence and Information, SNU — Jul 2021 - Aug 2021
Undergraduate Researcher (Advisor: Wonjong Rhee) — *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
- Applied 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 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 of scholarship and $8,000 for 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, Java Script, Type Script
Frameworks	Pytorch, Huggingface, Scikit-learn, React, Django, FastAPI
Data Processing	MR Image, Electrocardiogram, Spatial Transcriptomics, GWAS
Mathematics	Multivariate Calculus, Linear Algebra, Differential Equations