Woojin Chung | M.S. Student in Korea

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Summary

I earned my B.S. and am now pursuing an M.S. in Biomedical Engineering at Hankuk University of Foreign Studies under the supervision of Professor Nam. During my studies, I have been working on applying artificial intelligence to medical imaging analysis, including digital pathology, MR Imaging, and CTA. Currently, my research focuses on two primary fields. The first is using multiple foundation models in digital pathology to enhance dataset generalization. The second is predicting dynamic changes in contrast-enhanced imaging using deep learning–based image synthesis, particularly in DCE-MRI and multiphase CTA.
As shown in my curriculum vitae, I am committed to continuing my growth as a versatile researcher, skilled in programming, research, and academic writing.

Research Interests

Deep Learning	Generative Models, Foundation Models, Explainable AI
Computational Pathology	Lymph Node Metastasis, Whole-Slide Image
MR Imaging	Breast Cancer, Dynamic Contrast-Enhanced MRI
CT Angiography	Acute Ischemic Stroke, Multiphase CTA

Education

Mar 2024 – Present
M.S. in Biomedical Engineering, Hankuk University of Foreign Studies.
Advisor: Yoonho Nam
GPA: 4.5/4.5

Mar 2017 – Feb 2024
B.S. in Biomedical Engineering, Hankuk University of Foreign Studies.
GPA: 3.9/4.5
Thesis topic: Explored implicit neural representation architectures for effective image compression in whole-slide images

Publications

Journal Articles

1. **W. Chung**, J. Jang, and Y. Nam, "Quantitative susceptibility mapping of oxygen metabolism: A feasibility study utilizing a large-scale clinical dataset," *Investigative Magnetic Resonance Imaging*, vol. 27, no. 4, pp. 221–225, 2023. DOI: https://doi.org/10.13104/imri.2023.0013.

Conference Proceedings

1. **W. Chung**, Y. Park, and Y. Nam, "Autoencoder-based feature transformation with multiple foundation models in computational pathology," in *International Workshop on Foundation Models for General Medical AI*, Springer, 2024, pp. 40–49. DOI: https://doi.org/10.1007/978-3-031-73471-7_5.
2. **[Pre-print] W. Chung**, Y. Park, and Y. Nam, "Foundation model ensemble for out-of-distribution generalization: Predicting lymph node metastasis in early gastric cancer using whole-slide imaging," in *Medical Imaging with Deep Learning*, 2025. URL: https://openreview.net/forum?id=JspipsZKuo.

Conference Presentations

International

2025 **ISMRM Oral Presentation (Expected in May)**
Title: Predicting Delayed Phase Contrast-Enhanced MR Images from Early Phase Contrast-Enhanced MR Images Using Deep Learning-Based Iterative Network

2025 **MIDL Poster Presentation (Expected in July)**
Title: Foundation Model Ensemble for Out-of-Distribution Generalization: Predicting Lymph Node Metastasis in Early Gastric Cancer Using Whole-Slide Imaging

2024 **MICCAI Workshop MedAGI Poster Presentation**
Title: AutoEncoder-Based Feature Transformation with Multiple Foundation Models in Computational Pathology

Domestic

2024 **ICMRI Poster Presentation**
Title: Deep Learning-Based Dynamic Information Embedding for Synthesizing Arbitrary Time-Point Contrast-Enhanced Inner Ear MR Images

2023 **ICMRI Poster Presentation**
Title: Automatic Optimization of Multi-Loss Weights for MR Image Synthesis Using Coefficient of Variation Analysis

2022 **ICMRI Poster Presentation**
Title: Automatic Segmentation and Assessment Method for QSM-Based Oxygen Metabolism Analysis in the Superior Sagittal Sinus

Research Projects

Seoul St. Mary's Hospital (Seoul, Korea)

Mar 2022 – Dec 2022 Analyzed oxygen metabolism in QSM images using a deep learning-based segmentation, focusing on its relationship with the presence of the APOE4 gene in patients with cognitive impairment.

Mar 2024 – Present Developing a deep learning model to synthesize multi-phase delayed contrast-enhanced breast MR images from early-phase scans, enabling dynamic enhancement prediction.

Busan Paik Hospital (Busan, Korea)

Aug 2023 – Aug 2024 Developed a generative adversarial network (GAN)-based model to synthesize virtual 1-hour delayed contrast-enhanced MR images of the inner ear from early contrast-enhanced scans.

CHA Bundang Medical Center (Seongnam, Korea)

Jan 2023 – Present Predicting lymph node metastasis in early gastric cancer WSIs using a patch-based deep learning model across datasets with different distributions, leveraging information from multiple foundation models to improve generalization.

Ajou University Hospital (Suwon, Korea)

Mar 2024 – Present Developing a deep learning–based technique to quantify and visualize collateral status in acute ischemic stroke using multiphase CT angiography.

Honors and Awards

2025 **ISMRM Annual Meeting & Exhibition Educational Stipend**

2022 **Best Award, AI Idea Festival**
Organized by Hankuk University of Foreign Studies AI Education Institute

2022 **3rd Place, Burn Diagnosis AI Challenge**
Organized by Seoul National University R&DB Foundation

Teaching Experiences

Programming Instructor

Mar 2022 – Dec 2022 Coding Class at Pungsaeng High School, a science-focused school in Korea

Feb 2022 – Feb 2022 Shell & Shell Editors session of the HUFS Missing Semester at Hankuk University of Foreign Studies, Korea

Teaching Assistant

Fall 2024 Linear Algebra

Spring 2024 Biomedical Artificial Intelligence

Fall 2023 Medical Image Processing & Laboratory

Spring 2023 Biomedical Artificial Intelligence

Miscellaneous Experience

Academic Activities

2025 Program committee for IJCNN Special Session: Foundation Models in Medicine

Club Activities

2023 Programming Mentor at LIKELION, Student-Run Club of Programming

2022 Programming Mentor at LIKELION, Student-Run Club of Programming

2021 Mentee at LIKELION, Student-Run Club of Programming

Software Development

2025 **PASCAL (Ongoing):** A viewer software that supports medical imaging file formats such as DICOM and NIfTI, designed to easily integrate deep learning–based AI projects. Github: https://github.com/goglxych97/PASCAL.git

2024 **PathoPatch:** A software tool designed to facilitate easy annotation of patches extracted from whole-slide images. Github: https://github.com/goglxych97/PathoPatch.git

References

Yoonho Nam, Assistant Professor, Biomedical Engineering. **Hankuk University of Foreign Studies**, yoonhonam@hufs.ac.kr

Jin Wook Choi, Professor, Department of Radiology. **Ajou University School of Medicine**, radjwchoi@gmail.com