

Research Interests

Multimodal Learning: Vision Language Model, Self-Supervised Learning

AI for healthcare: Computational Pathology, Medical Image Analysis

Education

The University of North Carolina at Chapel Hill

Master's in Computer Science

NC, United States

Aug. 2024 – May. 2026

Chung-Ang University

B.S. in Applied Statistics & B.A. in French Literature

Seoul, South Korea

Mar. 2020 – Aug. 2023

Publications

Structural MRI-Informed Multimodal Fusion for Robust Alzheimer's Disease Prediction

Juhyun Lee, Sungjoon Park, Kyungwook Lee, Soorin Yim, Doyeong Hwang, Dongyun Kim, Kiwoong Yoo, Soonyoung Lee, Kiyoung Kim

NeurIPS Imageomics Workshop, 2025

Proformer: a hybrid macaron transformer model predicts expression values from promoter sequences

Il-Youp Kwak, Byeong-Chan Kim, **Juhyun Lee**, Taein Kang, Daniel J Garry, Jianyi Zhang, Wuming Gong

BMC Informatics, 2024

Research Experiences

UNC Carmichael Lab

Research Assistant (Advisor: Iain Carmichael)

NC, United States

Jan. 2026 – Current

- Probed bladder cancer Whole Slide Images using pathology foundation model and Multiple Instance Learning

UNC ViVE Lab

Research Assistant (Advisor: Saif Khairat)

NC, United States

Aug. 2025 – Dec. 2025

- Built a healthcare chatbot using Llama-3-8B with few-shot prompting and LoRA fine-tuning; deployed with vLLM and Flask
- Developed a speech-to-speech system using OpenAI API, WebRTC, and TypeScript, achieving seamless voice interaction

LG AI Research

Research Intern (Mentor: Sungjoon Park, Kiyoung Kim)

Seoul, South Korea

May 2025 – Aug. 2025

- Engineered a multimodal data processing pipeline and integrated it into a multimodal model, boosting Alzheimer's Disease classification accuracy by 20% over SOTA
- Architected a modular Plan-Act-Memory AI agent to automate biomedical tasks using LangChain

UNC Yap Lab

Research Assistant (Advisor: Pew-Thian Yap)

NC, United States

Jan. 2025 – May. 2025

- Developed an Implicit Neural Representation framework in PyTorch to map brain spherical coordinates to fMRI-based functional connectivity matrix, enabling efficient data compression and reconstruction of large-scale brain networks

UNC Data Driven EnviroLab

Research Assistant (Advisor: Angel Hsu)

NC, United States

Aug. 2024 – Dec. 2024

- Implemented ChatNDC, a RAG chatbot using LangChain, FAISS, and LLM APIs to deliver accurate and relevant responses on climate policy

Chung-Ang University

Research Intern (Advisor: Il-youp Kwak)

Seoul, South Korea

Mar. 2022 – June. 2023

Conference Presentations

- **UNC Innovate Cancer Data Science Symposium** Jan. 2026
Poster Presentation
- **NeurIPS Imageomics Workshop** Dec. 2025
Poster Presentation
- **UNC Graduate Research Symposium** Oct. 2025
Poster Presentation
- **UNC Data Science Day** Sep. 2025
Poster Presentation
- **International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting** May 2025
Oral Presentation

Academic Services

Reviewer

ICML 2026

Mentorship

UNC Graduate Women in CS Mentor

Teaching

- Instructor for *Medical Image Analysis and Computer Vision* for UNC PRIMES Summer School 2025

Awards/Honors

Summa Cum Laude, Chung-Ang University Aug. 2023
Department Honor Scholarship, Chung-Ang University Aug. 2020

Skills

Programming Languages: Python, MATLAB, Java, JavaScript, SQL, R

ML & Data Science: Pytorch, TensorFlow, LangChain, Scikit-Learn, NumPy, Pandas, Matplotlib, SAS

Web Development: SpringBoot, Git, VueJS

Languages: Fluent in Korean and English. Beginner in French.

References

Iain Carmichael

Professor at UNC Chapel Hill

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Kiyoung Kim

Senior Research Scientist at LG AI Research

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Pew-Thian Yap

Professor at UNC Chapel Hill

ptyap@med.unc.edu

Il-youp Kwak

Professor at Chung-Ang University

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