

Juhyun (Julie) Lee

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Research Interests

Deep Learning: Multimodal Learning (Vision Language Model), Self-Supervised Learning, Agentic AI
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, Kiy-oung 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

- Achieved 0.7 AUC in smoking status prediction from bladder cancer whole slide images by leveraging pathology foundation models and MIL

UNC ViVE Lab

Research Assistant (Advisor: Saif Khairat)

NC, United States
Aug. 2025 – Dec. 2025

- Fine-tuned Llama-3-8B using LoRA (PEFT) for clinical reasoning; deployed with vLLM and Flask
- Developed a speech-to-speech system for real-time interaction using OpenAI API, WebRTC, and TypeScript

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 (INR) framework that yielded 10x data compression while maintaining 92% reconstruction fidelity

UNC Data Driven EnviroLab

Research Assistant (Advisor: Angel Hsu)

NC, United States
Aug. 2024 – Dec. 2024

- Implemented a RAG chatbot using LangChain, FAISS, and LLM APIs to deliver accurate, 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 Computer Science Mentor

Teaching

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

Community

Korean-American Scientists and Engineers Association (KSEA)

Awards/Honors

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| Summa Cum Laude , Chung-Ang University | Aug. 2023 |
| Random Promoter Dream Challenge 2022 (3rd place) | Sep. 2022 |
| 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

iain@unc.edu

Kiyoung Kim

Senior Research Scientist at LG AI Research

elgee.kim@lgresearch.ai

Pew-Thian Yap

Professor at UNC Chapel Hill

ptyap@med.unc.edu

Il-youp Kwak

Professor at Chung-Ang University

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