updated 2025-11-26

Youngung Han

010-9676-1727 | | | |

전문연구요원 전직 희망

Education

SNU (Seoul National University) — Seoul, Korea
Ph.D. Candidate (ABD), Computer Science and Engineering — *Sep 2019 – Aug 2023*

KNUT (舊 韓國鐵道大學) — Uiwang, Korea
B.S. Computer Science & B.A. Railroad Management and Logistics (Double Major) — *Mar 2015 – Aug 2019*

- GPA: 3.83/4.5, Credits Earned: 167

Experience

Senior Research Engineer — Dec 2023 – Present
AIDEEP — *Gwacheon, Korea*

- **RAG Systems & Backend/DevOps:**
  - Architected and maintained the **CI/CD pipeline** (GitHub Actions) for the RAG data management backend (FastAPI), automating testing and deployment processes.
  - Led the implementation of a comprehensive automated testing suite using **pytest** (TDD approach), ensuring the reliability of 17 critical API endpoints (OpenAPI) including Vector DB synchronization and data versioning.
  - Engineered an end-to-end RAG-based conversational AI system, optimizing semantic retrieval and answer generation using LLM with Direct Preference Optimization (DPO).
- **LLM & NLP Research:**
  - Boosted LLM guardrail performance (Precision: 64.3% → 98.0%; Recall: 76.6% → 96.7%) by implementing a multi-layer safety framework (Self-check, Topical-rail, Filtering).
  - Deployed on the national "대학어디가" platform; officially recognized by the Korean Council for University Education (KCUE) for enhanced reliability.
  - Pioneered the first comprehensive Korean Machine Unlearning evaluation dataset; architected a GPT-4-based Q&A generation pipeline.
  - Developed an advanced PII de-identification system (NER), leveraging GPT-generated synthetic data to achieve an F1-score > 0.90.
- **Computer Vision & Generative Models:**
  - Streamlined a complex two-stage object detection system into a unified YOLO architecture (12 classes), reducing operational overhead while maintaining high accuracy (mAP@50: 0.96).
  - Improved deepfake detection F1-score (0.56 → 0.73) using a hybrid system incorporating Fourier features and custom diffusion loss.
  - Innovated identity-preserving facial feature injection for GAN and diffusion-based face-swapping, outperforming ETRI's model on CCTV datasets.
  - Pioneered a lightweight Transformer-based deep hashing model via ViT knowledge distillation, outperforming CNN methods by 39.4% mAP (CIFAR10).

Medical AI Researcher — Nov 2024 – Present
SNU Medical AI — *Seoul, Korea*

- Leading research on 3D medical imaging (MRI/CT) and Vision-Language Models (VLM) in collaboration with **NVIDIA** (HK/TW) and Samsung Medical Center (SMC). Advised by Prof. N. Kim (SNU) and Prof. W. Jeong (SMC).
- **Advanced 3D PNI Prediction Frameworks:**
  - **Architected** end-to-end 3D MRI analysis pipelines (NeoNet), integrating generative model-based augmentation (NeoGen) to address severe data imbalance.
  - **Innovated** specialized architectures: Developed Localized Attention (**TNA**) and Scale-Adaptive Mixing (**SAFM**) for boundary-sensitive detection (LoSA-Net).

    - **Introduced** Window-Specific Mixture-of-Head (**WS-MoH**) attention for adaptive 3D feature extraction (MMA-Former).
    - **Achieved** SOTA performance with **AUC 0.7903** (NeoNet); resulted in 1 AAAI Workshop acceptance and 2 ISBI submissions (First Author).
- **High-Resolution 3D Synthesis & SSL:**
    - Developed 3D-LLDM, a Label-Guided Latent Diffusion Model for high-resolution volumetric synthesis.
    - Improved FID by **26.7%** over SOTA diffusion models; boosted downstream segmentation Dice score by up to **11.15%** using synthetic data.
    - Contributed to MAESIL, an efficient 3D SSL framework using a novel **Superpatch** input unit (ICEIC Accepted).
- **3D Vision-Language Models (VLM):**
    - **Developed** MINTI, a visual-instructional training framework for 3D CT VLM using micro-boundary prompts to enhance spatial grounding (First Author).
    - **Enhanced** VLM efficiency; achieved performance comparable to 7B models using lightweight Qwen-2.5 backbones (1.5B), significantly reducing GPU requirements.

Backend Developer (Rookie) — Sep 2025 – Present

Wafflestudio — *Seoul, Korea*

- Mastered Test-Driven Development (**TDD**) principles; implemented comprehensive test suites for complex FastAPI applications using **pytest** (Assignment 5).
- Converted synchronous endpoints to asynchronous operations using **asyncio**, significantly improving application responsiveness and throughput (Assignment 5).
- Built and deployed robust CI/CD pipelines using **GitHub Actions**, automating Docker image builds, registry pushes, and deployment to AWS EC2 (Assignment 6).
- Successfully completed intensive assignments (Assign 1, Assign 2, Assign 3-6) within a selective backend development track.

Executive & Mentor — Oct 2023 – Present

OUTTA — *Seoul, Korea*

- Established strategic partnerships with institutions including SNU Engineering Centers, ChannelTalk, and Hanwha DreamPlus.
- Led an AI **paper study group** and mentored 586+ participants in the **OUTTA AI Bootcamp** (86% satisfaction rate).
- Authoring educational series (AI Fundamentals, ML, NLP), scheduled for publication in late 2025/early 2026.

Undergraduate Research Assistant — Dec 2018 – Mar 2019

Sogang University — *Seoul, Korea*

- Advised by Prof. Hyung-Min Park.
- Completed a graduate-level Digital Signal Processing project; implemented an adaptive FIR filter (LMS algorithm) in MATLAB for system identification and noise cancellation.

Undergraduate Research Assistant — Jan 2018 – Jul 2018

KNUT (舊 韓國鐵道大學) — *Uiwang, Korea*

- Advised by Prof. Sang-Moon Lee and Prof. Song-wook Lee.
- Engineered a logistics optimization system integrating a Selenium web crawler with the Gurobi optimization solver.

Selected Publications

Preprints / Under Review

- **Han, Y.**, Um, I., Kim, K., et al. (2026). LoSA-NET: A Localized and Scale-Adaptive Network for Boundary-Sensitive Prediction of Perineural Invasion in 3D MRI. *Submitted to IEEE ISBI 2026.*
- **Han, Y.**, Um, I., Kim, K., et al. (2026). MMA-FORMER: Adaptive PNI Prediction in 3D MRI via Coarse-Fine Transformer with Window-Specific Mixture-of-Head Attention. *Submitted to IEEE ISBI 2026.*
- Kim, K., Bae, J., **Han, Y.**, et al. (2026). 3D-LLDM: Label-Guided 3D Latent Diffusion Model for Improving High-Resolution Synthetic MR Imaging in Hepatic Structure Segmentation. *Submitted to IEEE ISBI 2026.*

International Conference & Workshop — 2018 – Present

- **Han, Y.**, Cha, M., Kim, K., et al. (2026). NeoNet: An End-to-End 3D MRI-Based Deep Learning Framework for Non-Invasive Prediction of Perineural Invasion via Generation-Driven Classification. In *W3PHIAI-26 (AAAI 2026 Workshop)*.
- Kim, K., Jung, H., **Han, Y.**, et al. (2026). MAESIL: Masked Autoencoder for Enhanced Self-supervised Medical Image Learning. In *Proceedings of the International Conference on Electronics, Information, and Communication (ICEIC)*.
- Kim, K., **Han, Y.**, Ju, S., et al. (2025). CIPHER: Counterfeit Image Pattern High-level Examination via Representation for GAN and Diffusion Discriminator Learning. In Proceedings of the 2025 IEEE/EIE International Conference on Consumer Electronics-Asia (ICCE-Asia). IEEE.
- **Han, Y.**, Kim, K., Ju, S., et al. (2025). FOSCU: Feasibility of Synthetic MRI Generation via Duo-Diffusion Models for Enhancement of 3D U-Nets in Hepatic Segmentation. In Proceedings of the 2025 IEEE Asia-Pacific Conference on Circuits and Systems (APCCAS). IEEE.
- Kim, S., Kim, Y., Min, S., **Han, Y.**, et al. (2024). Transformer-Based Unsupervised Deep Hashing Using Knowledge Distillation for Image Retrieval. In 2024 3rd International Conference on Artificial Intelligence and Software Engineering (ICAISE) (pp. 7-11). IEEE.

International Journal 2024 – Present

- Kim, Y†, Kim, S†, Min, S†, **Han, Y**†, Lee, O†, Kim, W† (2024). A Dual-Module System for Copyright-Free Image Recommendation and Infringement Detection in Educational Materials. Journal of Imaging, 10(11), 277.

Domestic Conference (Korea) 2018 – Present

- **Han, Y.**, Kim, K., Lim, J., Um, I., Go, H., et al. (2025). MINTI: Micro-boundary INstructional Training for Intelligent anatomical vision-language model. In Proceedings of the 2025 IEIE Fall Conference.
- Cha, M., **Han, Y.**, Bae, J., Lee, J., et al. (2025). Medical Volume Synthesis using a Label-Guided 3D Latent Diffusion Model with ControlNet Guidance. In Proceedings of the 2025 IEIE Summer Conference.
- **Han, Y.**, Song, C., Jung, H., LEE, S. (2018). Logistics Transportation System using Bigdata. In Proceedings of the Korean Society of Computer Information Conference.

Projects

CIPHER | *Python, Pytorch, Diffusion, GAN* May 2025 – Jul 2025

- Developed a robust deepfake detection pipeline using a ProGAN discriminator trained on 30,000 CelebA images as a baseline.
- Enhanced generalization by fine-tuning with FFHQ and synthetic images generated via Denoising Diffusion Probabilistic Model (DDPM).
- Engineered a hybrid detection model for both GAN- and diffusion-based deepfakes, achieving a 0.06 F1-score improvement over the GAN-only baseline.

Deep Diffusion Model for Unsupervised Learning | *Python, Pytorch, Diffusion* Jan 2025 – Mar 2025

- Implemented deep diffusion probabilistic model based on nonequilibrium thermodynamics principles.
- Developed modular training and inference pipelines (MNIST, Swiss Roll) with MLP-based denoising architecture and Gaussian time encoding.

OUTTA Gen AI Team Leadership | *Python, Pytorch, Diffusion, GAN, NLP* Dec 2024 – Present

- Led an interdisciplinary research team focusing on Diffusion Models, GANs, and NLP, fostering collaboration across experience levels.
- Organized weekly deep reviews of foundational and recent AI papers (Transformers, Medical AI) and supervised members from multiple universities.

MS-Clip-GAN | *Python, Pytorch, Multi-stage, GAN, Clip* Dec 2022 – Sep 2023

- Developed a multi-stage conditional GAN for text-to-image synthesis on the 30,000 MM-CelebA-HQ dataset.
- Implemented a 3-stage progressive generation pipeline (Conditioning Augmentation, Semantic Spatial-Aware attention) for 256×256 image synthesis, optimizing training by pre-extracting CLIP embeddings.

Technical Skills

Research Areas: 3D Deep Learning, Generative Models (Diffusion, GAN), Self-Supervised Learning (MAE), Vision-Language Models (VLM), LLM/RAG, Medical Imaging
Languages: Python (incl. asyncio), C
ML Frameworks: PyTorch (DDP, Lightning), MONAI
Backend & DevOps/MLOps: FastAPI, Redis, OpenSearch, pytest (TDD), OpenAPI, Vector DB, GitHub Actions (CI/CD), Docker
Libraries: Hugging Face (Transformers, Diffusers), LangChain, NumPy, Pandas, Scikit-learn
Tools & Platforms: Git, Conda, VS Code, AWS (EC2)

Honors & Awards

Songyee Yoon – Taekjin Kim Scholarship, NCSoft — Mar 2020
Outstanding Paper Award, Korea Society of Computer Information — Jul 2018

Licenses & Certifications

Engineer Big Data Analysis — Jul 2024
Certified Professional Logistician — Jul 2023
SQLD — Sep 2022
Engineer Information Processing — May 2018

Teaching Experience

Intro Machine Learning and Deep Learning, Samsung DSDS — Spring 2020 – Spring 2022
Computer Concepts and Practice, SNU — Spring 2020, 2021, 2023
Introduction to Data Mining, SNU — Spring 2022
Intro Data Science, SNU — Fall 2021
DataBase, SNU — Fall 2020