

Sangwoo Ha

ML Engineer · Medical AI · On-Device Optimization

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SUMMARY

ML engineer with 5+ years of experience in medical AI, from model development to regulatory approval and product commercialization. Led a chest X-ray AI project through KFDA clinical trials and published a first-author paper in *Nature npj Digital Medicine*. Currently responsible for cervical cell analysis AI at Noul, covering the full pipeline from whole-slide image processing and on-device detection to LLM-based diagnostic report generation. Previously developed construction site safety AI at HumanICT.

EXPERIENCE

ML Researcher — Noul Inc.

2023.08 - Present

Cervical Cell Analysis AI (CER Product) · Yongin, South Korea

- Designed and implemented the full preprocessing–detection–classification pipeline for whole-slide microscopy images, from field-of-view segmentation to individual cell classification
- Owned on-device detection model lifecycle: training, pruning, quantization, and inference optimization for embedded hardware
- Generated pseudo labels via diffusion/SSL-based teacher models; applied teacher-student distillation to improve on-device model accuracy under limited labeled data
- Standardized inter-device/slide color variation through stain normalization. Detected annotation errors using t-SNE-based label analysis
- Introduced multi-instance learning (MIL) to aggregate cell/patch embeddings into specimen-level diagnosis
- Built a RAG pipeline with MedGemma-family LLMs and medical literature for automated diagnostic report draft generation
- Independently designed a ResearchOps DAG connecting data processing, training, evaluation, and report generation agents for experiment reproducibility

Software Engineer — HumanICT Co., Ltd.

2022.05 - 2023.08

Alphai PlantVision AI · Seoul, South Korea

- Developed real-time detection models for fire, smoke, missing helmets, and vehicle classification on the Alphai PlantVision platform
- Compressed and quantized models for resource-constrained CCTV environments while maintaining accuracy
- Deployed and validated across multiple construction company sites in production conditions

Software Engineer — DeepNoid Inc.

2020.07 - 2022.05

Chest X-ray AI (DC-XR Series) · Seoul, South Korea

- **DC-XR-03:** Led AI team (part lead) for pneumothorax and consolidation detection. Designed localization-adjusted evaluation methodology requiring lesion-level accuracy. Passed KFDA clinical trials, obtained regulatory approval (Permit No. 21-841), commercialized as product
- Published clinical results as first author in *Nature npj Digital Medicine*
- **DC-XR-04:** Extended detection to 7+ thoracic conditions including lung cancer, atelectasis, cardiomegaly, pulmonary nodules, and pleural effusion

PUBLICATION

Lee, S.Y., **Ha, S.**, Jeon, M.G. et al. "Localization-adjusted diagnostic performance and assistance effect of a computer-aided detection system for pneumothorax and consolidation." *npj Digital Medicine* 5, 107 (2022). [doi:10.1038/s41746-022-00658-x](https://doi.org/10.1038/s41746-022-00658-x) — **First Author**

SKILLS

Languages	Python (primary, 6+ yrs), C/C++, Shell Script, TypeScript, Java
ML / DL	PyTorch, TensorFlow, ONNX, TensorRT, model pruning/quantization, knowledge distillation
Medical AI	Whole-slide image analysis, object detection (YOLO, Faster R-CNN), classification, MIL, stain normalization
LLM / Agent	RAG pipelines, LLM-based report generation, tool-calling, agent orchestration, ResearchOps DAG
Data	NumPy, Pandas, OpenCV, t-SNE, pseudo labeling, diffusion-based augmentation, label error detection
Infra	Linux, Docker, Git, CI/CD, on-device deployment, GPU cluster management
AI Tools	Claude Code, Cursor, Codex CLI, Gemini CLI

EDUCATION

M.S. Computer Science — UNIST 2017.03 - 2020.02

Thesis: "Predicting the Location of Injured People in Disaster Zones using Deep Learning"

Proposed gCBAM (gated CBAM) attention and Feature-Highlight Annotation for casualty density estimation. GPA 3.33/4.3

B.S. Electronic Engineering & Computer Engineering (Double Major) — Kyung Hee University 2012.03 - 2016.02

GPA 3.08/4.3

OPEN SOURCE & SIDE PROJECTS

- **oh-my-claudecode** — Docs maintainer. Multi-agent orchestration layer for Claude Code (186k+ stars)
- **oh-my-humanizer** — Open-source tool for detecting and removing AI writing patterns. Korean/English support
- **devswaha.xyz** — Portfolio site built with Next.js 16, React 19, Tailwind v4
- Smart store operation, solo development of SaaS and PT scheduling service. Daily use of Claude Code, Codex, Gemini CLI. Sharing AI coding tips on Threads (@vibe.tip)

AWARDS & CERTIFICATIONS

Seoul Ideathon Grand Prize (Seoul Mayor's Award), 2016

Kookmin Univ. Startup Camp Award, 2016

Kyung Hee Univ. Design Competition Bronze, 2016

- Graduation Thesis Creative Design Grand Prize, 2015

- TOEIC 835 (2016)

- G-TELP Level 2 Pass (2015)

LANGUAGES

Korean Native

English Professional working proficiency — conducted research under English-speaking advisor at UNIST; collaborated with international team members