Doohyun Park, Ph.D.
Research Scientist

Seoul, Republic of Korea
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SUMMARY OF EXPERTISE

1. Medical AI researcher with 9 first- or corresponding-author peer-reviewed publications (6 first-author, 3 corresponding-author).
2. End-to-end development of clinically validated AI models across CT, whole slide imaging, and fundus imaging.
3. Broad methodological expertise in detection, classification, segmentation, and prognostic modeling using real-world clinical and industry datasets.

EDUCATION

Yonsei University — *Mar. 2016 – Feb. 2024*
Ph.D. School of Electrical and Electronic Engineering — *Seoul, Republic of Korea*
Dissertation: *Artificial Intelligence-based Preoperative Prediction of Axillary Lymph Node Metastasis in Breast Cancer using Whole Slide Images*

Yonsei University — *Mar. 2012 – Feb. 2016*
B.S. School of Electrical and Electronic Engineering — *Seoul, Republic of Korea*

WORK EXPERIENCE

VUNO Inc. — *Dec. 2023 – now*
Research Scientist (Military Obligation) — *Seoul, Republic of Korea*

- Developed a self-supervised foundation model for medical imaging to enhance downstream task performance and data efficiency.
- Designed clinical validation protocols and performance evaluation frameworks aligned with real-world deployment requirements.
- Implemented noisy-label detection and dataset refinement strategies to improve training robustness.
- Optimized model architecture for reduced computational cost and practical deployment.
- Conducted proof-of-concept integration of multimodal medical LLMs into product-oriented pipelines.
- Published 5 peer-reviewed papers as first or corresponding author.

VUNO Inc. — *Aug. 2021 – July 2022*
Visiting Researcher — *Seoul, Republic of Korea*

- Led two independent research projects, each resulting in a first-author peer-reviewed publication.
- Developed a weakly supervised deep learning model for medical image abnormality detection and classification.
- Developed an AI model for COVID-19 severity assessment using multi-center clinical data.

SELECTED PUBLICATIONS

1. Frequency-Balanced Retinal Representation Learning with Mutual Information Regularization
   S Lee, S Kang, I Park, G K won, J Baek, **D Park**†
   † Corresponding author
   2026 ICLR, International Conference on Learning Representations

2. Task-Agnostic Noisy Label Detection via Standardized Loss Aggregation
   I Park, **D Park**†
   † Corresponding author
   2026 ISBI, IEEE International Symposium on Biomedical Imaging

3. A Comparative Study of Machine Learning and Deep Learning for Out-of-Distribution Detection
   J Baek, S Lee, G Kwon, **D Park**†
   † Corresponding author
   2026 ISBI, IEEE International Symposium on Biomedical Imaging

4. Multimodal AI model for preoperative prediction of axillary lymph node metastasis in breast cancer using whole slide images
   D Park, YM Lee, T Eo, HJ An, H Kang, E Park, YJ Cha, H Park, D Kwon, SY Kwon, HR Jung, SJ Shin, H Park, Y Lee, S Park, JM Kim, SE Choi, NM Cho†, D Hwang†
   2025 npj Precision Oncology

5. A Comprehensive Review of Performance Metrics for Computer-Aided Detection Systems
   D Park
   2024 Bioengineering

6. Deep Learning-based Slice Thickness Reduction for Computer-Aided Detection of Lung Nodules in Thick Slice CT
   J Jeong*, **D Park***, JH Kang, M Kim, HY Kim, W Choi, J Kim, SY Ham
   * Equally Contributed
   2024 Diagnostics

7. Weakly-Supervised Deep Learning for Multi-Label Classification of Vertebral Compression Fracture in CT
   E Choi*, **D Park***, G Son, S Bak, T Eo, D Youn, D Hwang
   * Equally Contributed
   2024 European Radiology

8. Development and Validation of A Hybrid Deep Learning-Machine Learning Approach for Severity Assessment of COVID-19 and Other Pneumonias
   D Park, R Jang, MJ Chung, HJ An, S Bak, E Choi, D Hwang
   2023 Scientific Reports

9. Importance of CT Image Normalization in Radiomics Analysis: Prediction of 3-Year Recurrence-Free Survival in Non-Small Cell Lung Cancer
   D Park, D Oh, M Lee, SY Lee, KM Shin, J-SG Jun, D Hwang
   2022 European Radiology

OTHER PUBLICATIONS

1. Prompt-Induced Bias from One-Shot Multimodal Large Language Models Prompting in Medical Imaging
   I Park, J Baek, **D Park**
   2026 ISBI, IEEE International Symposium on Biomedical Imaging - abstract

2. Prompt Dominance in Medical Multimodal Large Language Models
   I Park, J Baek, **D Park**
   2026 ISBI, IEEE International Symposium on Biomedical Imaging - abstract

3. Interpretable Multimodal Transformer for Prediction of Molecular Subtypes and Grades in Adult-type Diffuse Gliomas
   Y Byeon, YW Park, S Lee, **D Park**, H Shin, K Han, JH Chang, SH Kim, SK Lee, SS Ahn, D Hwang
   2025 npj Digital Medicine
4. Multi-center Validation of Pulmonary Nodule Classification Model for Lung Cancer Screening
   D Park, JH Kang, C Park
   2025 Preprints
5. Attention-based Interpretable Deep Learning with Radiomic Features for Pulmonary Nodule Classification
   D Park, N Lee, S Lim
   2025 MIDL, Medical Imaging with Deep Learning – short paper track
6. Foundation Model-based Unsupervised CT Kernel Conversion for Standardizing Emphysema Quantification
   D Park, J Kang, J Jeong
   2025 ECR *(Oral Presentation)*, European Congress of Radiology
7. Evaluation Metrics for Computer-Aided Detection Systems in Medical AI: What You Need to Know
   D Park
   2025 ECR, European Congress of Radiology
8. Deep Learning-based Lesion Segmentation for Patients with Usual Interstitial Pneumonia in High-Resolution CT: A pilot study
   D Park, J Kang, J Jeong, KM Moon
   2025 JRC, Japan Radiology Congress
9. Fully Automated Segment-Anything-Model for Robust Lobe Segmentation in Patients with Interstitial Lung Disease
   S Lim, **D Park,** J Jeong, C Park, KM Moon
   2025 JRC, Japan Radiology Congress
10. Deep Learning-based Slice Thickness Reduction for Lung Nodule Detection of Thick Slice Chest CT
    J Jeong, **D Park,** JH Kang, M Kim, HY Kim, W Choi, SY Ham
    2025 JRC, Japan Radiology Congress
11. Nodule Type Classification for Lung Cancer Screening with CT
    D Park, J Kang, C Park, J Kim
    2024 WCLC, World Conference on Lung Cancer
12. A Standardized Performance Evaluation Metric for Chest CT Nodule Detection
    D Park, C Park, J Kang, J Kim
    2024 ESTI, European Society of Thoracic Imaging
13. A Multi-center Retrospective Study of Nodule Type Classification using Artificial Intelligence for Lung-RADS Scoring with CT
    D Park, J Kang, C Park, J Jeong
    2024 RSNA, Radiological Society of North America
14. Quantity or Certainty: Can Ambiguously Annotated Data Improve Lung Nodule Detection Performance?
    C Park, J Kang, **D Park**, J Jeong
    2024 RSNA, Radiological Society of North America
15. LLM-guided Multi-modal Multiple Instance Learning for 5-year Overall Survival Prediction of Lung Cancer
    K Kim**,** Y Lee, **D Park**, T Eo, D Youn, H Lee, D Hwang
    2024 MICCAI, International Conference on Medical Image Computing and Computer Assisted Intervention
16. Unified Diffusion model for Multi-contrast Ensembling Synthesis
    Y Lee, Y Shin, **D Park**, G Son, T Eo, D Hwang
    2024 ISMRM *(Oral Presentation)*, International Society for Magnetic Resonance in Medicine

17. Deep Learning Algorithm for Prediction of Molecular Subtypes and Grades in Adult-type Diffuse Gliomas: According to the 2021 WHO Updates
    Y Byeon, YW Park, S Lee, H Shin, **D Park**, SS Ahn, S-K Lee, D Hwang
    2024 ISMRM *(Oral Presentation)*, International Society for Magnetic Resonance in Medicine
18. Deep Learning-based Joint Effusion Classification in Adult Knee Radiographs: A Multi-Center Prospective Study
    H Won, HS Lee, D Youn, **D Park**, T Eo, W Kim, D Hwang
    2024 Diagnostics
19. M3F: Multi-Field-of-View Feature Fusion Network for Aortic Vessel Tree Segmentation in CT Angiography
    Y Byeon, H Kim, K Kim, **D Park**, E Choi, D Hwang
    3rd Place, MICCAI Grand Challenge (SEG.A – Segmentation of the Aorta), Technical Paper
    2023 LNCS *(Best Paper Award)*, Lecture Notes in Computer Science
20. Foundation Models in Healthcare: Applications, Challenges, and Future Directions
    H Won, **D Park**, T Eo, Y Lee, D Hwang
    2023 CICS, Conference on Information and Control Systems
21. Iterative Cross-Domain Deep-Learning Approach for Reconstructing Undersampled Radial MRI
    D Park, T Eo, T Kim, J Jang, D Hwang
    2018 ISMRM, International Society for Magnetic Resonance in Medicine
22. Deep Sinogram Learning for Radial MRI: Comparison with k-space and Image Learning
    T Kim, T Eo, **D Park**, Y Jun, D Hwang
    2018 ISMRM, International Society for Magnetic Resonance in Medicine
23. Correction of severe beam-hardening artifacts via a high-order linearization function using a prior-image-based parameter selection method
    D Oh, S Kim, **D Park**, S Choi, H Song, Y Choi, S Moon, J Baek, D Hwang
    2018 Medical Physics
24. Beam Hardening Correction Using Length Linearization
    D Oh, S Kim, **D Park**, D Hwang
    2017 SPIE Medical Imaging, International Society for Optics and Photonics

INTERNATIONAL PATENTS

1. Method of predicting prognosis of patient with adenocarcinoma using image feature
   2025 US, Granted No. US12500003B2
2. Makeup evaluation system and operating method thereof
   2023 US, Granted No. US11748980B2
3. Cosmetic evaluation system and operation method thereof
   2022 China, Granted No. CN110235169B
4. Makeup evaluation system and its operation method
   2022 Japan, Granted No. JP7020626B2
5. Makeup evaluation system and operating method thereof
   2021 US, Granted No. US11113511B2
6. Method of predicting prognosis of patient with adenocarcinoma using image feature
   2024 EPO, Application No. EP4218032A4
7. Method of predicting prognosis of patient with adenocarcinoma using image feature
   2023 China, Application No. CN116325019A
8. Makeup evaluation system and operation method thereof
   2020 EPO, Application No. EP3579176A4

DOMESTIC PATENTS

1. Method for Predicting Prognosis in Cancer Patient Using Radiomic Feature
   2025 Korea, Granted No. 10-2758775
2. Method for outputting segmentation information for an image and device therefor
   2024 Korea, Application No. 10-2024-0176698
3. Method for Prodicting Prognosis in Lung Cancer Patient using Clinical Information and Gene Polymorphism Information
   2021 Korea, Granted No. 10-2305806
4. Make-up evaluation system and operating method thereof
   2020 Korea, Granted No. 10-2066892
   Technology transfer with ₩20,000,000
5. Device and Method for Reconstructing Computed Tomography Image
   2019 Korea, Granted No. 10-2039472

INVITED TALK

1. Global Engagement & Empowerment Forum on Sustainable Development (GEEF)
   Topic: *Ensure Healthy Lives by Predicting the Prognosis of Cancer Patients Using Medical Images*
   2023 GEEF, about United Nations (UNs) Sustainable Development Goals (SGDs)
2. Yonsei University Graduate School
   Topic: *Clinical Applications and Their Technologies Based on Deep Learning*
   2023 Guest lecturer

TEACHING ASSISTANT

1. Electrical and Electronic Engineering Capstone Design
   Topic: Iterative CT Reconstruction Algorithm
2. Electrical and Electronic Engineering Capstone Design
   Topic: Feature Selection Algorithm
3. Electrical and Electronic Engineering Capstone Design
   Topic: Deep learning-based segmentation in CT
4. Digital Signal Processing