Kyungwon **Kim**

PH.D. CANDIDATE

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Summary

Currently studying the field of medical image processing, in particular, I'm striving to overcome the limitations of technology by applying artificial intelligence technology. It is expected to be of great help in diagnosis in an actual medical environment.

Affiliation

Yonsei University — *Seoul, S.Korea*

PH.D. CANDIDATE, MEDICAL ARTIFICIAL INTELLIGENCE LABORATORY (MAI-LAB) — *Mar. 2019 - PRESENT*

Education

Ph.D Candidate in Electrical and Electronic Engineering — *Seoul, S.Korea*

YONSEI UNIVERSITY — *Mar. 2019 - PRESENT*

- Got a Brain Korea 21 Plus Outstanding Student Fellow Scholarship of Korea Research Foundation

B.S. in Electrical and Electronic Engineering — *Seoul, S.Korea*

YONSEI UNIVERSITY — *Mar. 2012 - Feb. 2019*

- Got a National Scholarship for Science & Engineering of Korea Student Aid Foundation

Research Areas

Multi-modal Cancer Prognosis Prediction

MEDICAL

- Survival prediction for lung cancer patients using CT images, pathological images, and clinical data.
- Prognosis prediction for multiple cancer types using pathological images and genomic data under missing-modality settings.

Segmentation and Classification in X-ray and CT Image

MEDICAL

- Methods for automatic detection of anatomical or pathological regions in radiological images and disease classification based on image features.

Self-supervised Denoising Low-dosed X-ray Image

MEDICAL

- Deep learning–based methods for denoising low-dose X-ray images to approximate high-dose image quality without paired supervision.

Clinical Report Generation from 3D CT

MEDICAL

- Large Language Model (LLM)–based approaches for generating clinical reports, including findings and impressions, from 3D CT images.

Deep-Learning-based Fourier Ptychographic Microscopy (FPM)

OPTICS

- Techniques for reconstructing high-resolution optical images with a large field of view from multiple low-resolution images acquired under physical constraints.

Publications-Journal

M3F: Multi-Field-of-View Feature Fusion Network for Aortic Vessel Tree Segmentation in CT Angiography

YUNSU BYEON, HYESEONG KIM, **KYUNGWON KIM**, DOOHYUN PARK, EUIJOON CHOI, AND DOSIK HWANG — *Oct. 2023*

- MICCAI CHallenge on Segmentation of the Aorta

Publications-Conference

LLM-guided Multi-modal Multiple Instance Learning for 5-year Overall Survival Prediction of Lung Cancer — *MICCAI*

Kyungwon Kim, Yongmoon Lee, Doohyun Park, Taejoon Eo, Daemyung Youn, Hyesang Lee, and Dosik Hwang — *Oct. 2024, Marrakesh, Morocco*

- FWCI 5.09

Deep residual network with data consistency for subsampled Fourier Ptychographic Microscopy — *SPIE Photonics West*

Hyeongyu Kim, **Kyungwon Kim**, Kyungchul Lee, Taejoon Eo, and Seungah Lee, Dosik Hwang — *Jan. 2022, San Francisco, USA*

Are Two MR Images Enough to Generate the Third One Accurately? - Clinically Feasible Fat Suppression of Lumbar Spine MRI from T1w and T2w Images Only — *ISMRM & SMRT*

Sewon Kim, Hanbyol Jang, **Kyungwon Kim**, Hyeon Gyu Kim, Young Han Lee, Sungjun Kim, and Dosik Hwang — *Aug. 2020, Virtual*

Patents

2022 **Method, Device and Recording Medium for Obtaining Parameter Data on an Object**, Applied — *S.Korea*

Teaching Experience

Deep Learning Lab — *Seoul, S.Korea*

Teaching Assistant — *Mar. 2022 - Jun. 2022*

- pf. Dosik Hwang, Department of Electrical and Electronic Engineering, Yonsei University

Introductory Digital Labs — *Seoul, S.Korea*

Teaching Assistant — *Sep. 2021 - Dec. 2021*

- pf. Dosik Hwang, Department of Electrical and Electronic Engineering, Yonsei University

Biomedical Engineering Experiments — *Seoul, S.Korea*

Teaching Assistant — *Sep. 2020 - Dec. 2020*

- pf. Dosik Hwang, Department of Electrical and Electronic Engineering, Yonsei University

Digital Signal Processing — *Seoul, S.Korea*

Teaching Assistant — *Mar. 2020 - Jun. 2020*

- pf. Dosik Hwang, Department of Electrical and Electronic Engineering, Yonsei University

Biomedical Engineering Experiments — *Seoul, S.Korea*

Teaching Assistant — *Sep. 2019 - Dec. 2019*

- pf. Dosik Hwang, Department of Electrical and Electronic Engineering, Yonsei University

Research Experience

Segmentation of Oral Cancer and Lymph Node Metastasis from Head CT — *Seoul, S.Korea*

Finance All Solutions Co. — *Nov. 2025 - PRESENT*

- Developing deep learning–based methods to segment primary oral cancer lesions and metastatic lymph nodes from head CT scans collected from multiple institutions.

Detection and Segmentation of Osteomyelitis of the Jaw from 3D Dental CT — *Seoul, S.Korea*

Finance All Solutions Co. — *Jul. 2024 - Jun. 2025*

- Aiming to classify the presence of osteomyelitis and identify its precise location using 3D oral CT scans collected from six institutions.

Landmark Detection in Craniofacial 3D CT Data of Congenital Anomalies — *Seoul, S.Korea*

Finance All Solutions Co. — *Jul. 2024 - Jun. 2025*

- Detection of 45 Landmarks in 3D Craniofacial CT Data for Identifying Congenital Anomalies

Report Generation from 3D CT using LLM — *Montreal, Canada*

Mila ×Probe Medical — *Jun. 2024 - Sep. 2024*

- Participated in the 'Seoul AI Hub x Mila - Partnership' as a researcher affiliated with Probe Medical.
- Development of a clinical report generating LLM from 3D CT.

Prognosis Prediction of Lung Cancer via multi-modality — *Seoul, S.Korea*

Yonsei University ×Probe Medical — *Sep. 2023 - Oct. 2024*

- Government-funded AI Dataset Construction Project (NIA)
- Development of a 5-year overall survival prediction model using 3D CT, pathological image, and clinical data.

Deep-learning-based Fourier Ptychographic Microscopy — *Seoul, S.Korea*

Yonsei University — *Sep. 2020 - Jan. 2022*

- Collaboration with OISL(Optical Imaging Systems Laboratory), Yonsei University

Denoising in X-ray image — *Seoul, S.Korea*

Rayence Inc. — *Jun. 2021 - Dec. 2022*

- Development of a deep learning model that denoises and enhances the image quality of low dose X-ray image which helps patients to expose lower X-ray.

Disease classification and segmentation for Pediatric Chest X-ray — *Seoul, S.Korea*

Finance All Solutions Co. — *Jul. 2021 - Dec. 2021*

- Development of a deep learning model that classifies the specific diseases and the finds the location of lesions in pediatric chest X-ray image. Establishment of chest X-ray image dataset of pediatric subjects.

Auto Bone Segmentation in Cervical/Thoracic/Lateral Spinal Image — *Seoul, S.Korea*

Rayence Inc. — *Sep. 2019 - Sep. 2020*

- Development of an algorithm that automatically finds the spine in C/T/L spine x-ray images and calculates the curvature of the spine

Object Area Detection in X-ray Image — *Seoul, S.Korea*

Rayence Inc. — *Sep. 2019 - Mar. 2020*

- Development of a deep learning model that automatically extracts only the object area, not the background, from medical x-ray images
- Mounted on the product

Navigation Implant — *Seoul, S.Korea*

OSSTEM Implant Co. — *Jan. 2019 - Jun. 2020*

- Development of an algorithm to find the optimal implant location using tooth scan data consisting of 3D stl files

Collimator Area Detection in X-ray Image — *Seoul, S.Korea*

Rayence Inc. — *Sep. 2018 - Mar. 2019*

- Since the collimator used to minimize the exposure radiation dose is unnecessary information in the x-ray image, an algorithm that automatically removes the corresponding area was developed.
- Mounted on the product

Awards

2024	**Challenge Award**, 2024 Yonsei Medical Center Big Data Challenge	*S.Korea*
2023	**3rd Rank**, MICCAI 2023 Grand Challenge SEG.A. Segmentation of the Aortic Vessel Tree	*Vencouver, Canada*

Scholarship

2020	고등교육혁신팀사회혁신활동장학금, Yonsei University	*S.Korea*
2020	**Graduate Student Research Assistant Scholarship**, Yonsei University	*S.Korea*
2020	**Teaching Assistant Scholarship**, 2nd semester, Yonsei University	*S.Korea*
2020	**Teaching Assistant Scholarship**, 1nd semester, Yonsei University	*S.Korea*
2019	**Teaching Assistant Scholarship**, 2nd semester, Yonsei University	*S.Korea*
2019	**Research Assistant Scholarship**, 2nd semester, Yonsei University	*S.Korea*
2019	**Research Assistant Scholarship**, 1st semester, Yonsei University	*S.Korea*
2019-PRESENT (every month)	**Brain Korea 21 Plus Scholarship**, Korea Research Foundation	*S.Korea*
2012	**National Scholarship for Science and Engineering**, Korea Student Aid Foundation	*S.Korea*