



생성형 AI 기반 심폐질환 진단 및 치료경과 예측

성명 이동현

소속 서울대학교병원

2025 제4회
COMMUNITY CONFERENCE
TANGO

Target Adaptive No-code neural network
Generation and Operation framework



주관 ETRI (TANGO)

주최 과학기술정보통신부 IIIP 정보통신기획평가원

문의 parkjb@etri.re.kr / 042-860-5565

후원 LAB labup wedo tesla System
KEITI 한국전자기술연구원 AIVN SUREDATA ACRYL h 하늘소프트 TTA 한국정보통신기술협회
SNUH 고려대학교 홍익대학교 카이스트 KOREA UNIVERSITY HONGIK UNIVERSITY KAIST
서울대학교

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1. 의료 AI 활용

소개

의료진 검색

SNUH 서울대학교병원

이동현 교수

관심의료진 | 프린트 | 공유 | H

본원진료

영상의학과

진료분야 : 의료인공지능, 의료영상처리

예약센터 1588-5700

SNUH 서울대학교병원

학력/경력

학력

2015. ~ 2020. 서울대학교 공과대학 협동과정 바이오엔지니어링, 박사
2013. ~ 2015. 서울대학교 공과대학 협동과정 바이오엔지니어링, 석사
2008. ~ 2013. 한양대학교 전자시스템공학, 학사

경력

2025. 3. ~ 현재 서울대학교 의과대학 영상의학교실 | 서울대학교병원 영상의학과, 조교수
2021. 3. ~ 2025. 2. 충남대학교 의과대학 의공학교실 | 충남대학교병원 의공학과, 기금조교수/조교수
2021. 3. ~ 2023.12. 충남대학교병원 의생명연구원 빅데이터센터, 의료IT개발지원실장/부센터장
2020. 9. ~ 2021. 2. 서울대학교병원 의생명연구원, 연구조교수
2016. 9. ~ 2019. 8. 서울대학교병원 의생명연구원, 전문연구요원

학회

2025. 4. ~ 현재 대한영상의학회, 초빙회원
2025. 1. ~ 현재 대한의료인공지능학회, 교육이사
2024. 1. ~ 현재 Radiological Society of North America (RSNA), 정회원
2024. 1. ~ 현재 European Soceity of Radiology (ESR), 정회원
2023. 1. ~ 현재 대한의용생체공학회, 종신회원
2021. 3. ~ 현재 대한의료인공지능학회, 정회원
2021. 3. ~ 현재 대한의학영상정보학회, 정회원
2021. 3. ~ 현재 대한의료정보학회, 정회원
2021. 3. ~ 현재 MICCAI Society, 정회원

Research Areas

AI-driven Radiology Applications

This area leverages AI to perform in-depth analyses of radiological images covering the entire human body, including modalities such as X-ray, CT, MRI, and Ultrasound. Our objective is to demonstrate the clinical utility of AI in radiology applications and ultimately enable radiologists to integrate these solutions effectively into real-world clinical settings.

Multi-modal Biomedical Data Analysis

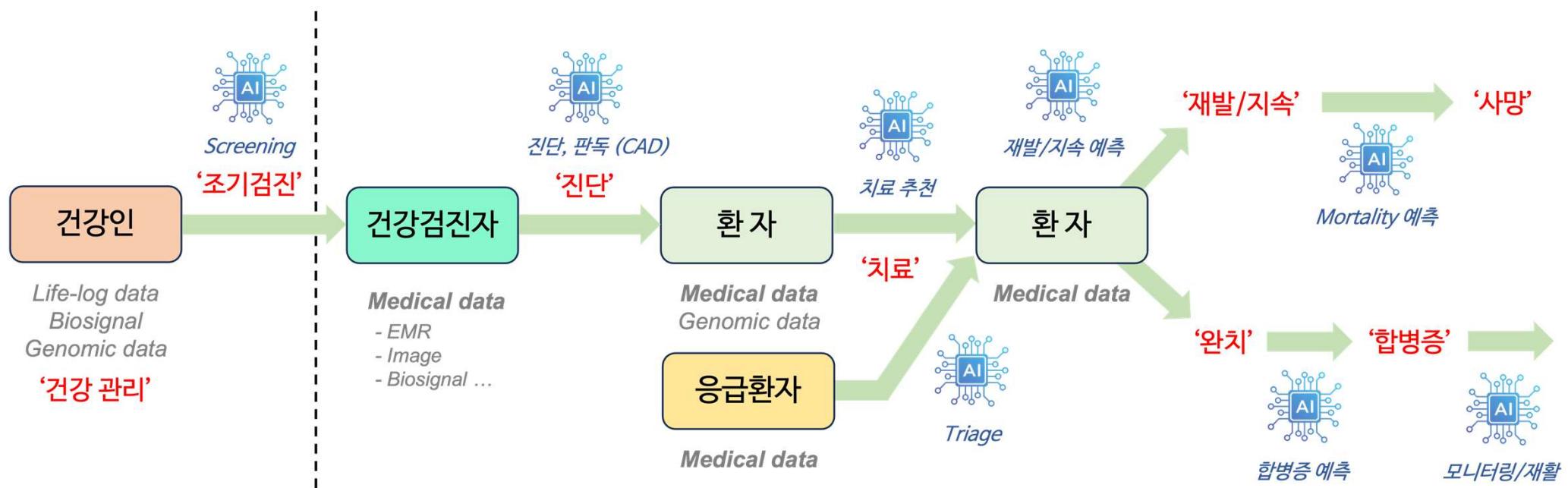
This area comprehensively analyzes diverse multi-modal biomedical data—including endoscopic images, bio-signals, omics data, and EHR—to offer in-depth insights into disease mechanisms and facilitate personalized medicine. Our objective is to leverage hospital real-world data (RWD) to expand the applications of a Large Multi-modal Model (LMM) and Agentic AI, and to validate them in clinical settings.

Advanced AI Techniques for Medical Applications

This area is dedicated to exploring innovative AI methods specifically designed for medical applications. We focus on developing novel algorithms and optimization strategies to address a wide range of challenges in the clinical domain. Our objective goes beyond methodological advancement; we aim to create AI solutions that seamlessly integrate with clinical workflows and settings, ultimately enhancing patient care.

1. 의료 AI 활용

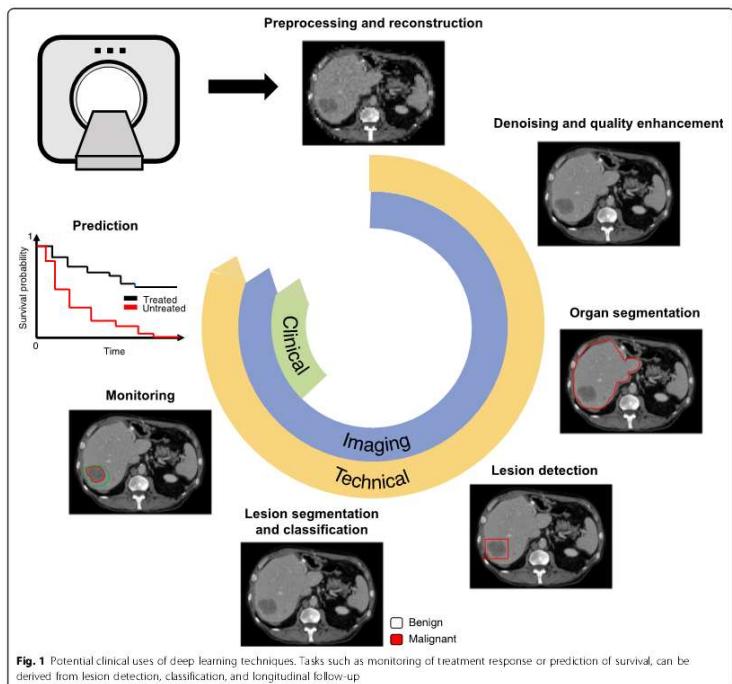
임상 현장에서의 AI 활용



참고자료: '의료 영역에서 인공지능의 역할', 국립암센터 홍보율

1. 의료 AI 활용

의료 AI 기대효과



- ✓ 정확한 진단 (Increased Accuracy)
- ✓ 자동 분석 (Automated Analysis)
- ✓ 조기 예측 (Early Detection)
- ✓ 스크리닝 (Enhanced Screening)
- ✓ 연속적인 모니터링 (Continuous Monitoring)
- ✓ 맞춤형 치료 계획 (Personalized Treatment Plans)
- ✓ 교육 및 연구 지원 (Education and Research Support)

Montagnon, Emmanuel, et al., *Insights into imaging* 11.1 (2020): 22.

1. 의료 AI 활용

의료 AI 기대효과

- ✓ 정확한 진단 (Increased Accuracy)

숙련도



피로도



1. 의료 AI 활용

의료 AI 기대효과

- ✓ 자동 분석 (Automated Analysis)

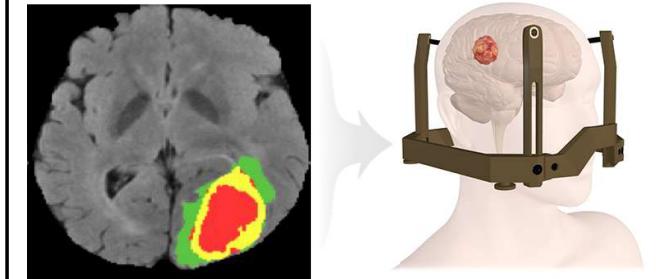
응급상황



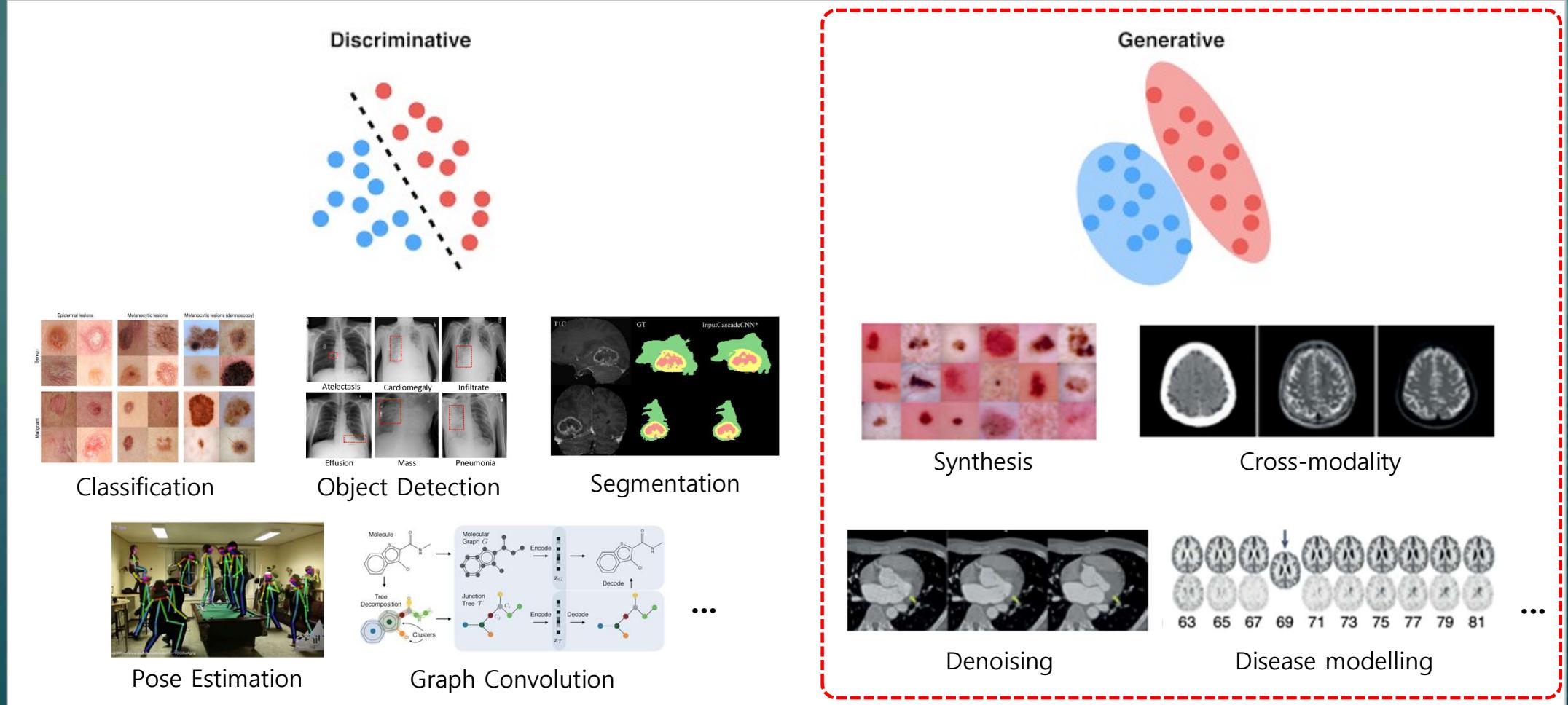
의료 지원



정량화



2. 의료 분야의 생성형 AI



2. 의료 분야의 생성형 AI

생성형 AI



언제 어디서나 궁금하면?
네이버 지식iN

지식과 내가 함께 커가는곳.
4천만 지식iN 사용자가 함께 궁금증을 해결하고 있어요.

서비스 바로가기 :



질문하기



지식iN 베스트



지식iN 우수답변자



지식iN 전문가



When I
realize ChatGPT
can do my job



When I
realize ChatGPT
can do my job



Large Language Model (LLM)



Claude vs ChatGPT vs Gemini

Small Language Model (sLM)

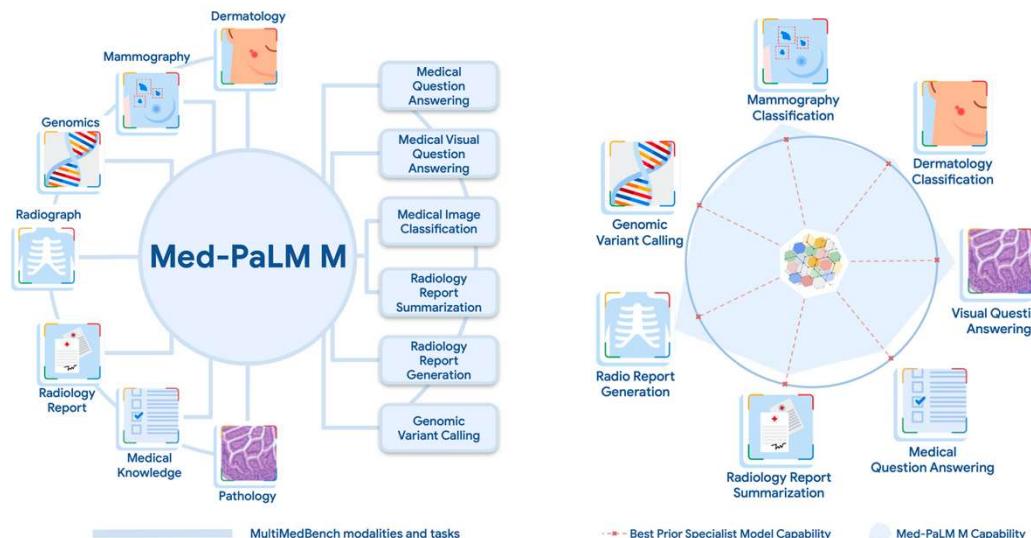


2. 의료 분야의 생성형 AI

의료 분야의 생성형 AI

Med-PaLM M (2023) "Towards Generalist Biomedical AI"

: 14 tasks across modalities (text, medical imaging, and genomics)



Tu, Tao, et al. "Towards generalist biomedical ai." *NEJM A/1.3* (2024): Aloa2300138.

Can you write me a report analyzing this chest X-ray?



Findings:

- Devices: None.
- Lungs: No pneumothorax. No substantial pleural effusion. Lungs appear clear.
- Cardiomedastinal: Normal heart size. Mediastinal contours within normal limits.
- Other: No acute skeletal abnormality.

Impression:

No active disease seen in chest.

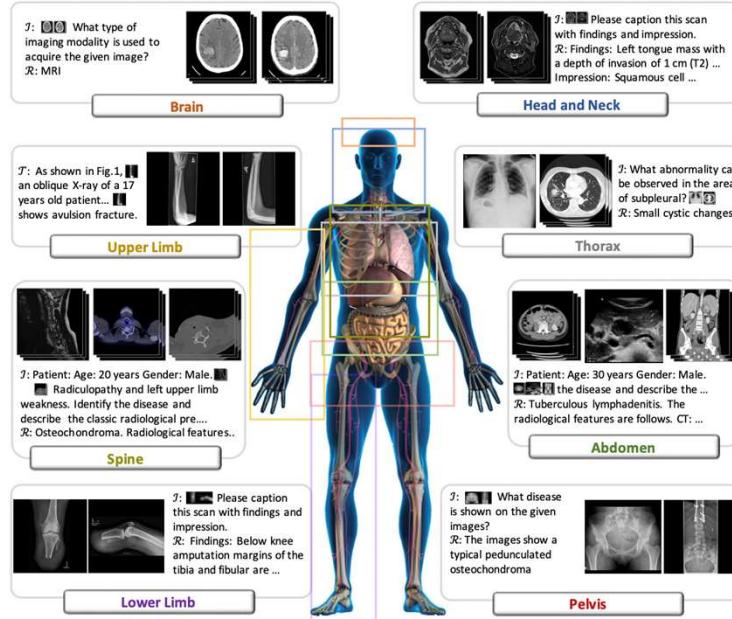
Enter a question here

2. 의료 분야의 생성형 AI



영상의학 분야의 생성형 AI

RadFM (2023)



Qualitative examples of medical visual question answering task

Input Prompt	RadFM Prediction
A 25-year-old Iranian man presented with symptoms and signs of Cushing's syndrome (weight gain, proximal muscle weakness, epigastric pain, hypertension, diabetes, and multiple fractures). A whole body CT scan was unremarkable. Bilateral adrenalectomy was performed. Postoperative CT scan showed that she had developed a 17 × 11 mm mass in the posterior basal segment of the right lung. What is the abnormality in the posterior aspect of the inferior third lung highly suggestive of? <image-1>	Please caption this scan with findings and impression.
<image-1> <image-2> <Patient Data> Age: 40 years Gender: Male. Perirectal purulent discharge and tenderness. Please caption this scan with finding and impression. <image-3> <image-4>	Findings: Injection of contrast via the orifice of purulent discharge showed opacification of the perianal abscess. No evidence of obvious contrast extravasation into the anal canal or rectum. Impression: Opacification of the perianal abscess. No evidence of contrast extravasation into the anal canal or rectum.
<image-1> <image-2> <image-3> <image-4>	Reference Report
<image-1> <image-2> <image-3> <image-4>	Findings: Injection of contrast via the orifice of purulent discharge showed opacification of the left perianal abscess. No evidence of obvious contrast extravasation into the anal canal or rectum. Impression: Left perianal abscess with no evidence of contrast extravasation into the anal canal or rectum.

Qualitative examples of report generation task

Input Prompt	RadFM Prediction
<image-1> <image-2> <image-3> <image-4>	Qualitative examples of rationale diagnosis task
<image-1> <image-2> <image-3> <image-4>	Input Prompt
<image-1> <image-2> <image-3> <image-4>	RadFM Prediction
<image-1> <image-2> <image-3> <image-4>	Input Prompt
<image-1> <image-2> <image-3> <image-4>	RadFM Prediction
<image-1> <image-2> <image-3> <image-4>	Input Prompt
<image-1> <image-2> <image-3> <image-4>	RadFM Prediction

Qualitative examples of rationale diagnosis task

Input Prompt	RadFM Prediction
<image-1> <image-2> <image-3> <image-4>	Pulmonary embolism. The Radiographic features can be summarized as follows: Plain radiograph: - Fleischner sign: enlarged pulmonary artery - Hounsfield sign: peripheral wedge of airspace opacity implying lung infarction - Westerman sign: regional oligemia - Pecten sign - Knuckle sign: enlarged right descending pulmonary artery - Palla sign: enlarged right descending pulmonary artery - Chang sign: dilated right descending pulmonary artery with sudden cut-off - Elevated diaphragm CT: - Filling defects within the pulmonary vasculature with acute pulmonary emboli - Polo Mint sign: central filling defect surrounded by a thin rim of contrast - Thin stream of contrast adjacent to non-occlusion
<image-1> <image-2> <image-3> <image-4>	Pulmonary embolism. The Radiographic features can be summarized as follows: Plain radiograph: - Fleischner sign: enlarged pulmonary artery - Hounsfield sign: peripheral wedge of airspace opacity implying lung infarction - Westerman sign: regional oligemia - Pecten sign - Knuckle sign: enlarged right descending pulmonary artery - Palla sign: enlarged right descending pulmonary artery - Chang sign: dilated right descending pulmonary artery with sudden cut-off - Elevated diaphragm CT: - Filling defects within the pulmonary vasculature with acute pulmonary emboli - Polo Mint sign: central filling defect surrounded by a thin rim of contrast - Thin stream of contrast adjacent to non-occlusion
<image-1> <image-2> <image-3> <image-4>	Input Prompt
<image-1> <image-2> <image-3> <image-4>	RadFM Prediction

Patient Data: Age: 75 years. Gender: Male. Follow up of traumatic subarachnoid hemorrhage. Analyze the radiographic features and identify the disease. Please generate a radiology report for this scan. <image-1>

Input Prompt

RadFM Prediction

Patient Data: Age: 75 years. Gender: Male. Follow up of traumatic subarachnoid hemorrhage. Analyze the radiographic features and identify the disease. Please generate a radiology report for this scan. <image-1> <image-2>

Input Prompt

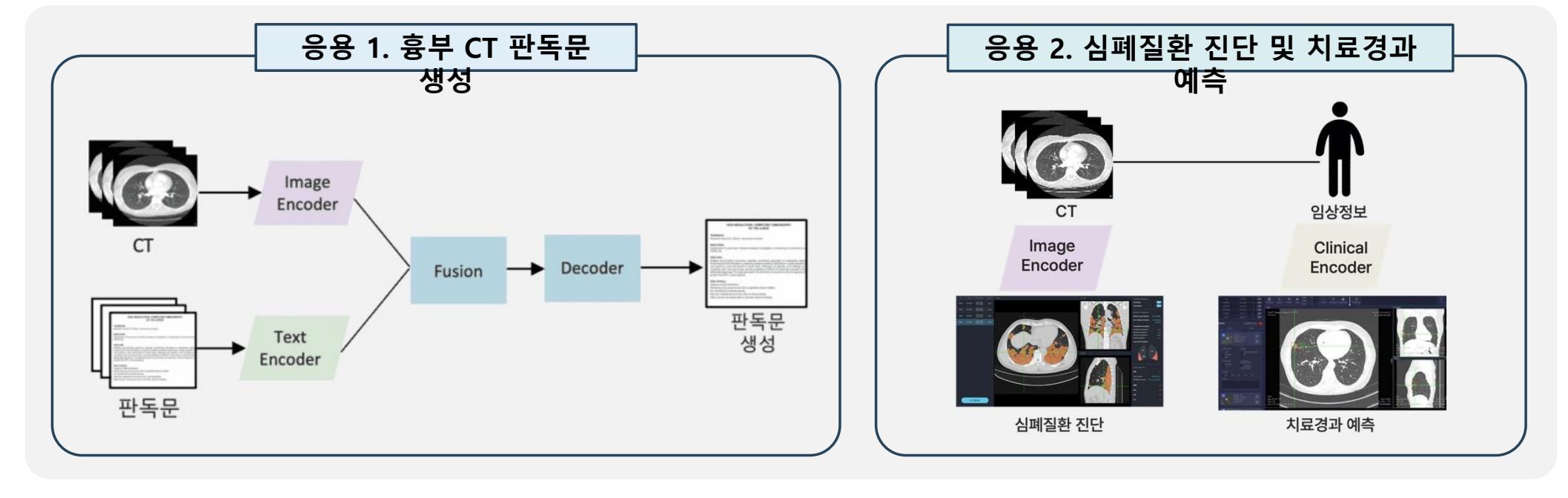
RadFM Prediction

Wu, Chaoyi, et al. arXiv preprint arXiv:2308.02463 (2023).

3. 생성형 AI: 심폐질환 진단 및 치료경과 예측

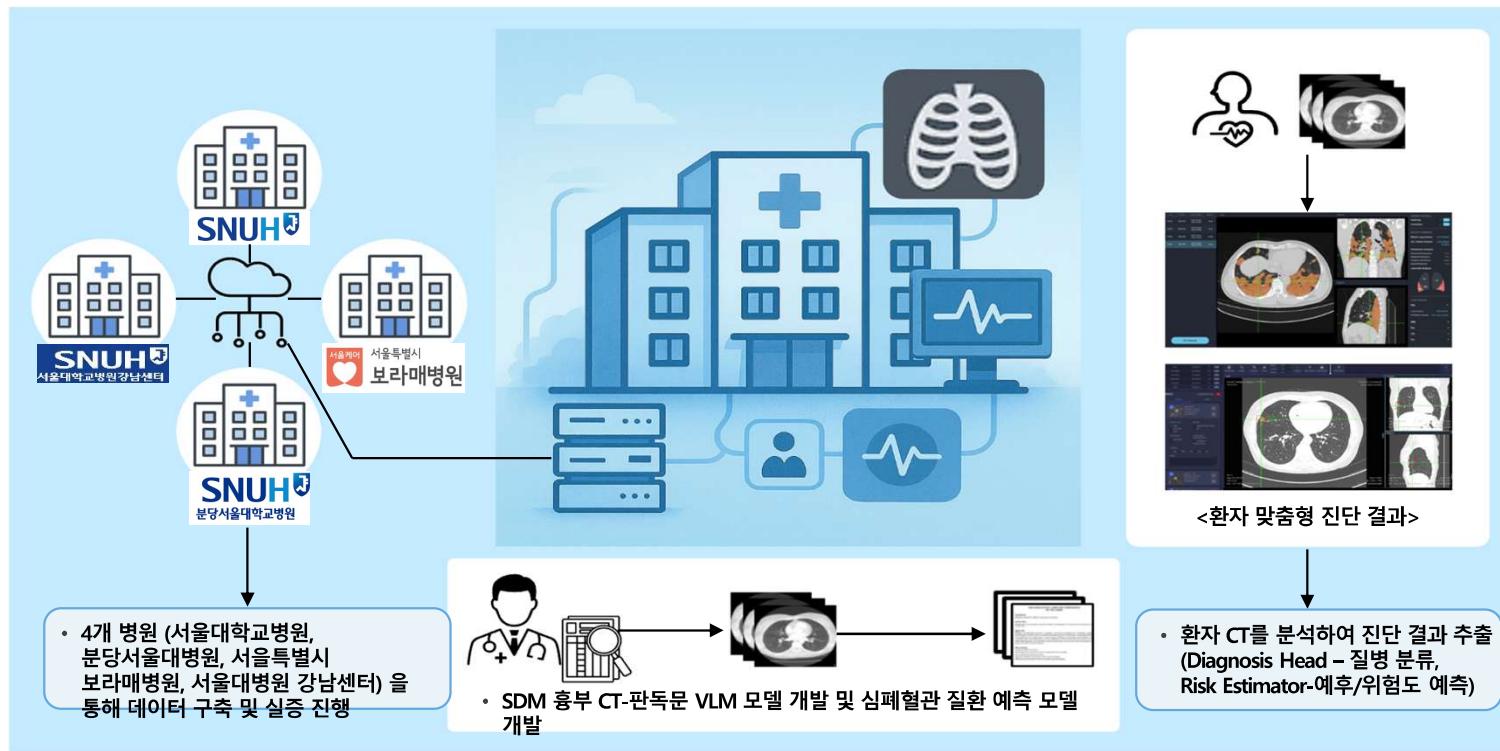
흉부 CT-판독문 생성형 AI

- ☑ 멀티모달 데이터(흉부 CT – 판독문)을 이용한 Vision-Language Model(VLM) 개발



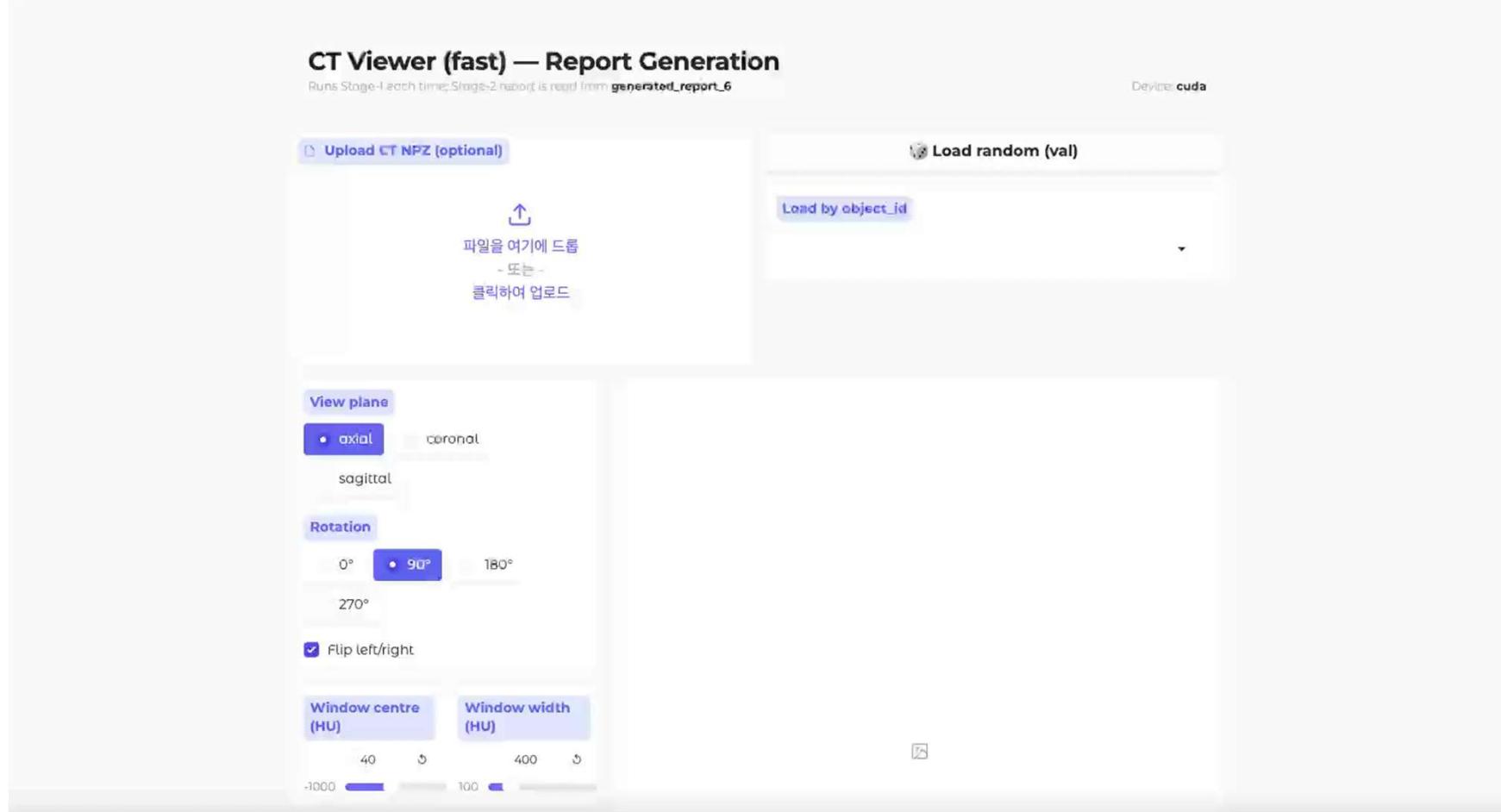
3. 생성형 AI: 심폐질환 진단 및 치료경과 예측

흉부 CT-판독문 생성형 AI



3. 생성형 AI: 심폐질환 진단 및 치료경과 예측

Demo





감사합니다.



주 관 ETRI (TANGO)

주 최 과학기술정보통신부 IITP 정보통신기획평가원

문 의 parkjb@etri.re.kr / 042-860-5565

후 원



KEITI 한국전자기술연구원

AIVN 주식회사 에이브이엔

SUREDATA

ACRYL

하늘소프트

TTA 한국정보통신기술협회

1. 강연 제목 (G마켓 산스 Bold 24pt)

16



강연 소제목 (나눔스퀘어 Bold 20pt)

내용입력하시면 됩니다. (나눔스퀘어 14pt)

강조내용 (나눔스퀘어 14pt, ctrl+B)

1. 강연 제목 (G마켓 산스 Bold 24pt)

17



강연 소제목 (나눔스퀘어 Bold 20pt)

내용입력하시면 됩니다. (나눔스퀘어 14pt)

강조내용 (나눔스퀘어 14pt, ctrl+B)