EECS E6895 Spring 2026
Agentic AI
Midterm Project Plan

Radiologist 1:
“RAV”

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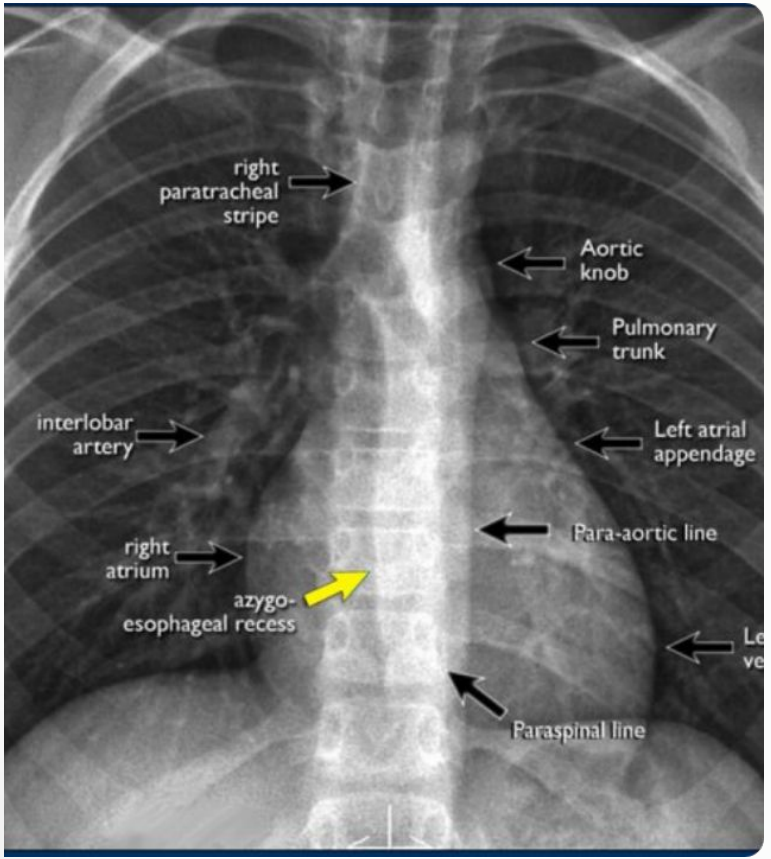


Project Goal

We will build an agentic AI app / workflow that imitates the basic analytical and diagnostic tasks of a medical radiologist.

Given medical images such as x-ray, MRI, or CT scans, our radiologist agent “RAV” will analyze, segment, and extract relevant information using computer vision.

Then, the agent will output key diagnostic information such as the presence of a fracture or a tumor, using natural language.

Additionally, our agent will provide qualitative remarks on the diagnosis. Is it a compound or simple fracture? Is the tumor malignant or merely benign?

Data

For model training, we will use an open source dataset of relevant medical images, available from various online repositories.

As an example, Stanford AIMI has a selection of public datasets, one of which is the CheXpert Plus dataset. This dataset includes "223,462 unique pairs of radiology reports and chest X-rays across 187,711 studies from 64,725 patients.”

Training images must be linked to reports that describe the image and provide clear diagnostic information. We will extract key information as text labels to use in supervised training.

https://aimi.stanford.edu/shared-datasets

Models

We plan to use a pre-trained *computer vision* model as a foundation model. We will then fine-tune the model to tailor it our specific medical imaging task(s). Choosing what specific task(s) we want to address will be key to driving this additional layer of training.

In our preliminary analysis, we've already identified a few pre-trained models, such as RF-DETR and YOLOv12. However we will conduct additional research to determine the one most ideal for radiologist context.

Additionally, we'll use Gemini 1.5 Flash *LLM* to enable natural language input and output, which will also require fine-tuning.

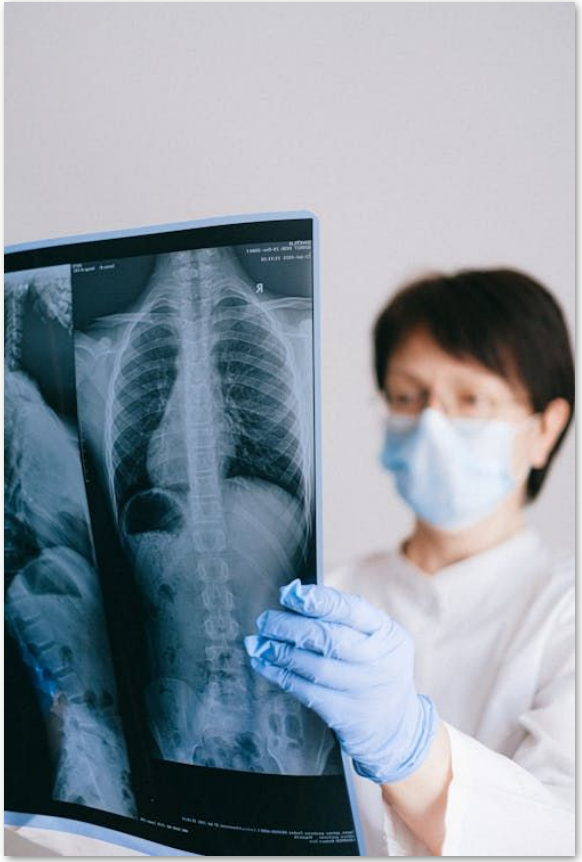
https://blog.roboflow.com/pre-trained-models/

Architecture / UI

We will leverage Model Context Protocol (**MCP**), developed by Anthropic, to enable "RAV" to interact with external resources.

"RAV" will accept a medical image from the user via file upload, then apply our fine-tuned computer vision model to locate and identify visual areas of interest. These areas will be classified accordingly, and then a summary of findings will be generated.

Our usage context will be limited to diagnostic medical imaging. Analysis, decision-making, and text generation will be autonomous. Additionally, we will build a simple demo UI using **Streamlit**.



Evaluation

We will evaluate our agent using a comprehensive, multi-pronged approach.

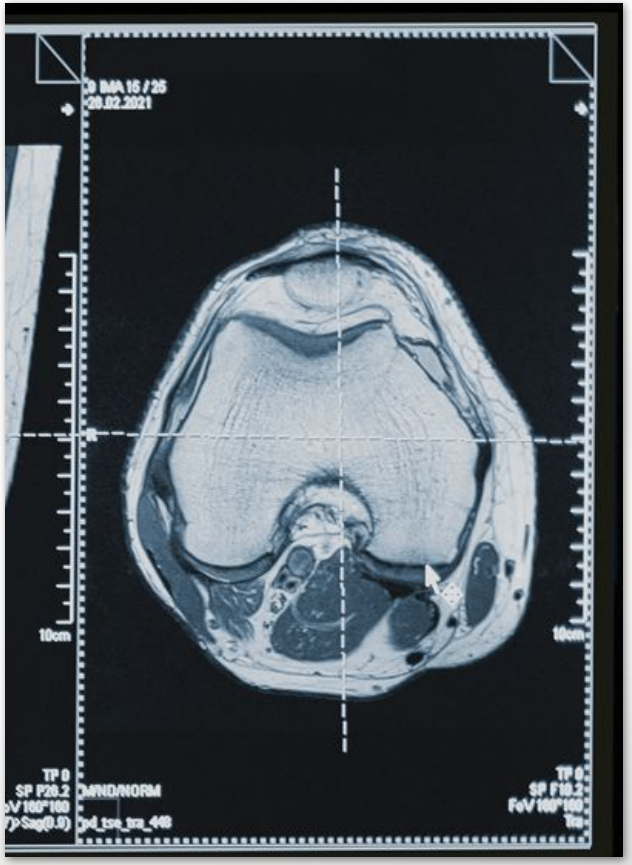
MCP integration will be evaluated using Stanford's **MedAgentBench**, which tests efficiency and accuracy of an agent's interactions with external medical data.

For "RAV" as a whole, we will test *quantitatively* by measuring model output against known pathology tags/labels, and generate F1-Scores. We can feed results back in to further improve overall accuracy.

We will also test "RAV" *qualitatively* by asking a more powerful, specialized LLM (e.g. **MedGemma**) to evaluate the agent's outputs. Scoring will be based on semantic similarity.

Thank you.

Any questions? Visit us at:
radiologist-rav.com



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