**The Code for Superlative Biosciences LLC Skin Cancer Patient Lesions Large Vision Model Classifier**

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import os

import numpy as np

from vision\_agent.tools import \*

from typing import \*

from pillow\_heif import register\_heif\_opener

register\_heif\_opener()

import vision\_agent as va

from vision\_agent.tools import register\_tool

from vision\_agent.tools import load\_image, florence2\_sam2\_image, clip, qwen2\_vl\_images\_vqa

def classify\_skin\_cancer(image\_path):

# Load the image

image = load\_image(image\_path)

# Segment the skin lesion

segmentation = florence2\_sam2\_image("skin lesion", image)

# Classify the image against skin cancer types

cancer\_types = ['melanoma', 'basal cell carcinoma', 'squamous cell carcinoma', 'normal skin']

classification = clip(image, cancer\_types)

# Get detailed description of the lesion

description\_prompt = "Describe the visual characteristics of the skin lesion in this image, focusing on features that might indicate melanoma."

detailed\_description = qwen2\_vl\_images\_vqa(description\_prompt, [image])

# Analyze the results

melanoma\_score = next((score for label, score in zip(classification['labels'], classification['scores']) if label == 'melanoma'), 0)

# Determine classification and confidence

if melanoma\_score > 0.7:

classification = "Melanoma"

confidence = melanoma\_score

else:

classification = "Uncertain"

confidence = 1 - melanoma\_score # Confidence in it not being melanoma

return {

"classification": classification,

"confidence": confidence,

"detailed\_description": detailed\_description,

"segmentation": segmentation, # This will be a list of dictionaries

"clip\_classification": classification

}