Comprehensive Skin Lesion Analysis Report

Prediction: nv
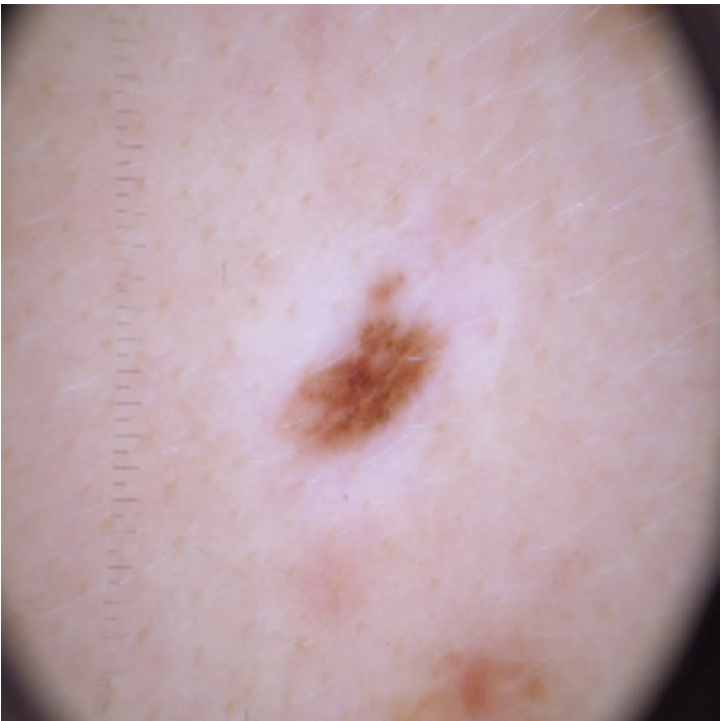
Confidence: 0.84

Generated on: 2025-03-19 10:14:38

Image and Predictions

Original Image

Full Prediction Confidence

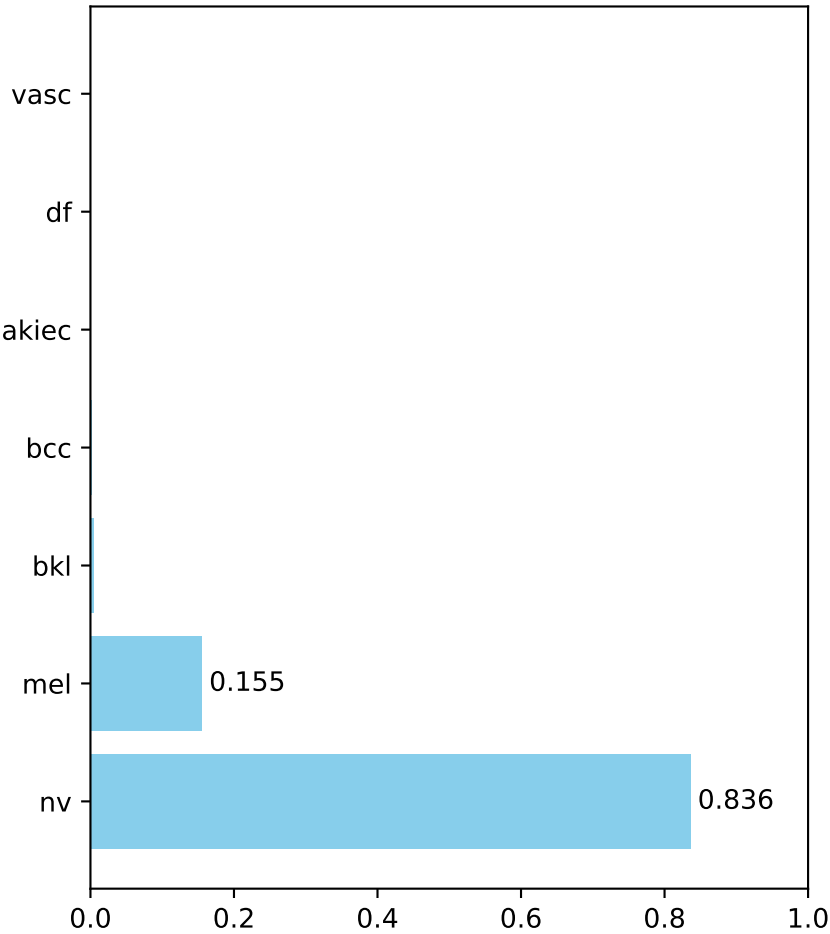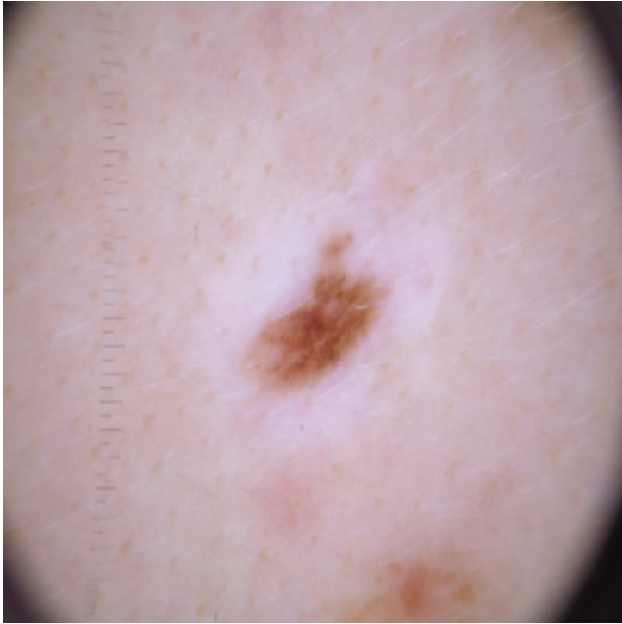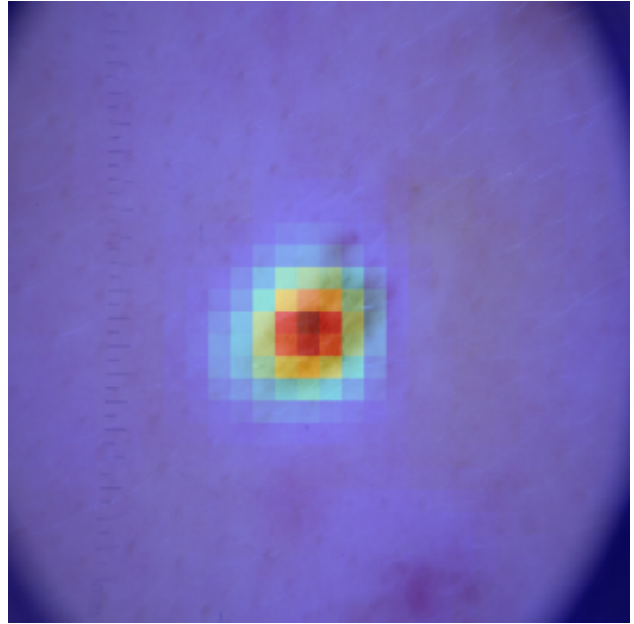| Class	Confidence
vasc	
df	
akiec	
bcc	
bkl	
mel	0.155
nv	0.836

Image Name: sample_image
Date Analyzed: 2025-03-19 10:14:38
Model: SkinLesionModel
Image Size: 224x224
Top Predictions:
 1. nv: 0.8362
 2. mel: 0.1554
 3. bkl: 0.0048
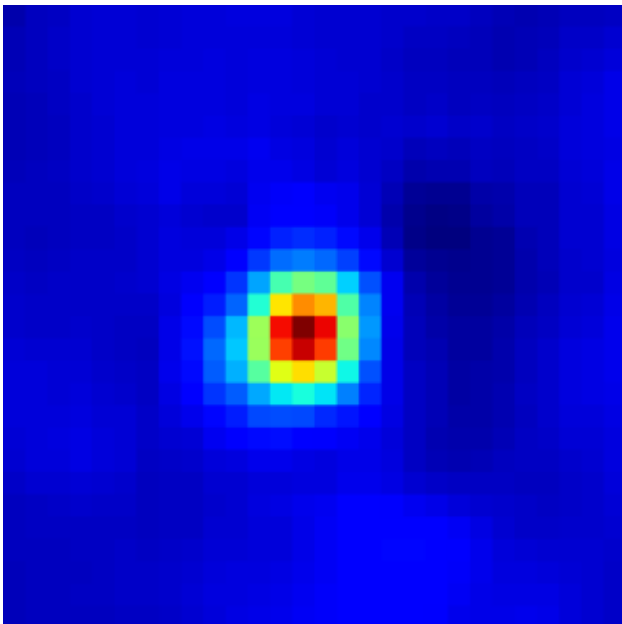
Grad-CAM Explanation

Original Image

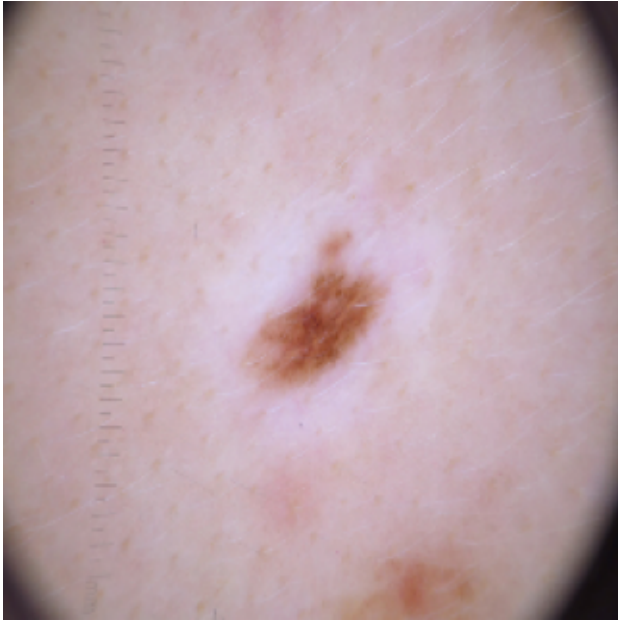## Grad-CAM Explanation

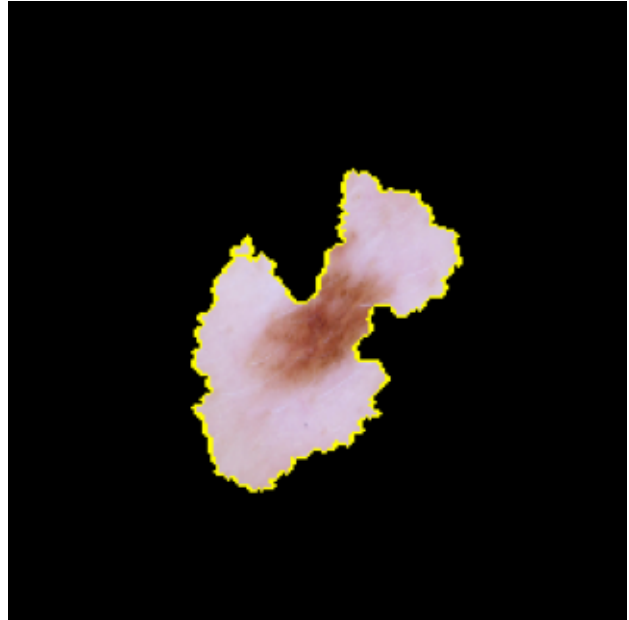## Grad-CAM Explanation Heatmap

Description:

Grad-CAM (Gradient-weighted Class Activation Mapping) uses the gradients flowing into the final convolutional layer to highlight important regions in the image for the predicted class. Brighter areas indicate regions that strongly influenced the prediction.

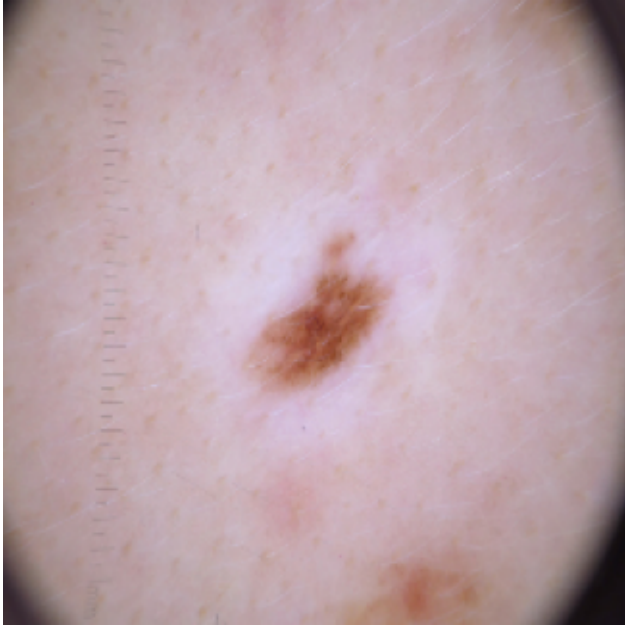# LIME Explanation

## Original Image

LIME Explanation

Description:

LIME (Local Interpretable Model-agnostic Explanations) perturbs the input image by segmenting it and turning segments on or off. It then fits a simple model to approximate how the segments affect the model's prediction. Green regions positively contribute to the prediction, while red regions negatively contribute.
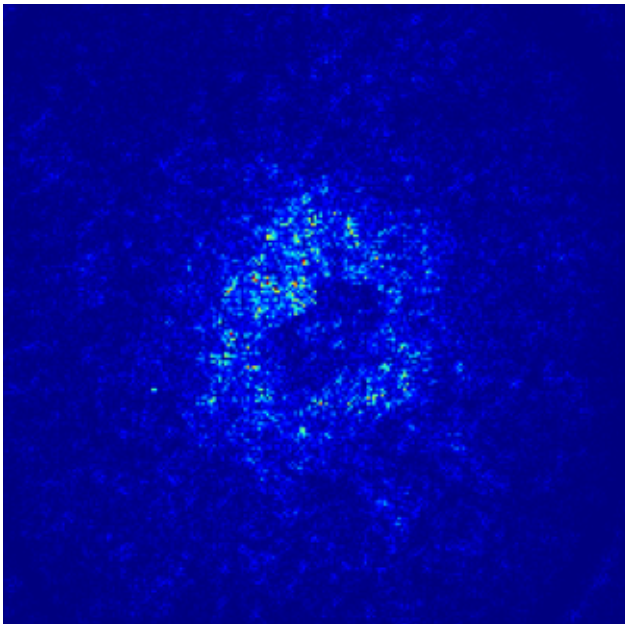
Integrated Gradients Explanation

Original Image

Integrated Gradients Explanation
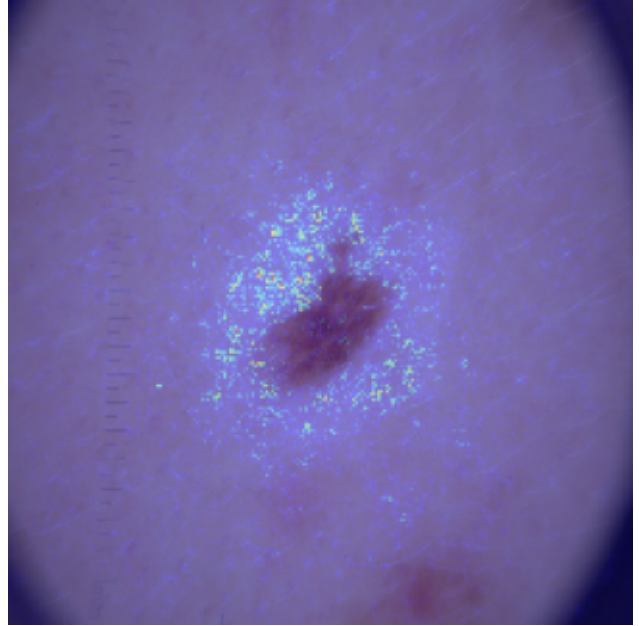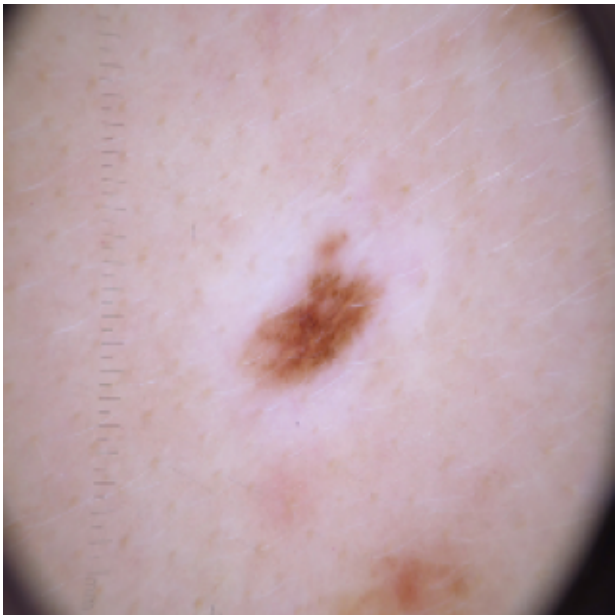

## Integrated Gradients Explanation Heatmap

Description:

Integrated Gradients computes the path integral of the gradients along a straight line from a baseline image (usually black) to the input image. This provides a pixel-level attribution map showing the contribution of each pixel to the prediction.
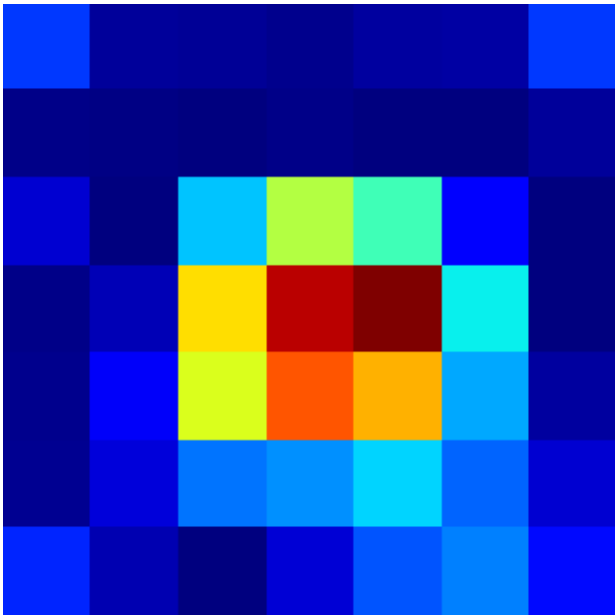
Class Activation Mapping

Original Image

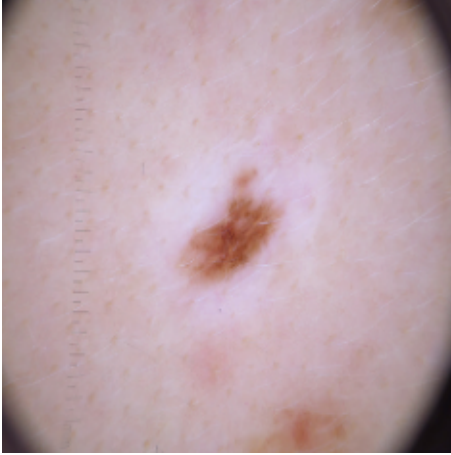## Class Activation Mapping
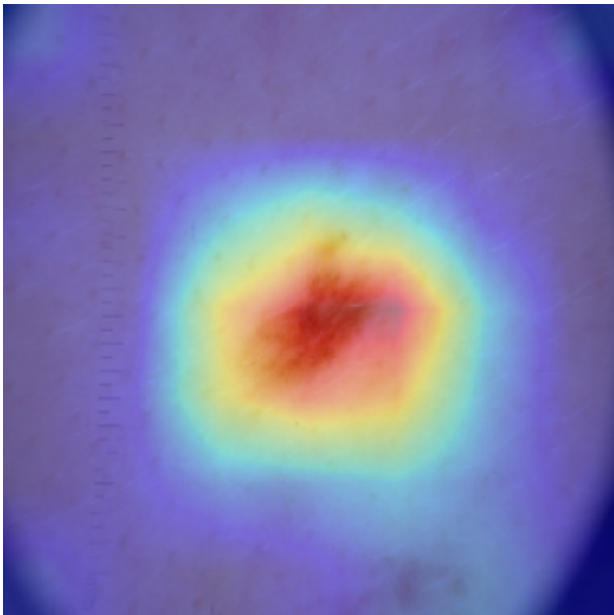
Class Activation Mapping Heatmap
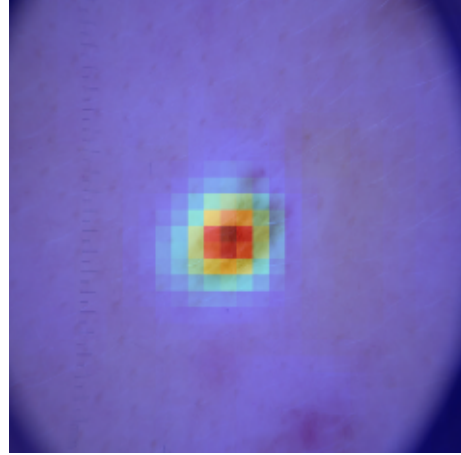

Description:

Class Activation Mapping (CAM) visualizes the class-specific feature maps in the last convolutional layer. It shows which regions of the image were most important for the model's prediction of the specific class.
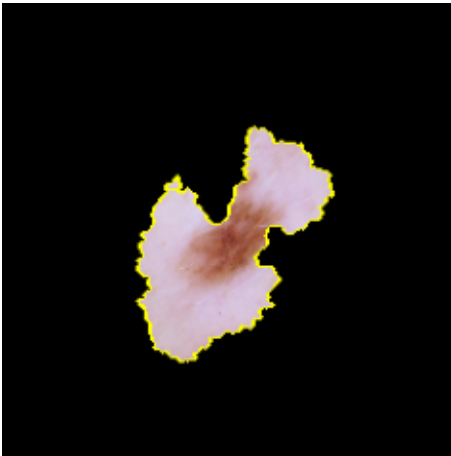
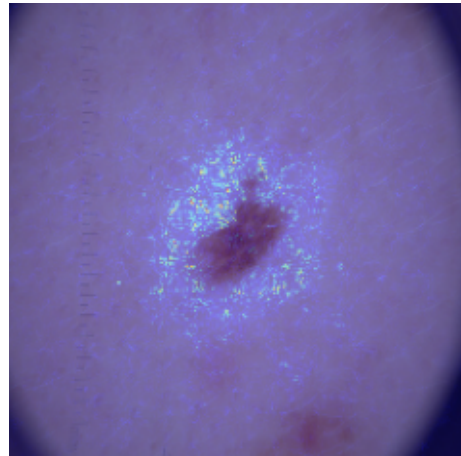# Comparison of All Explanation Methods

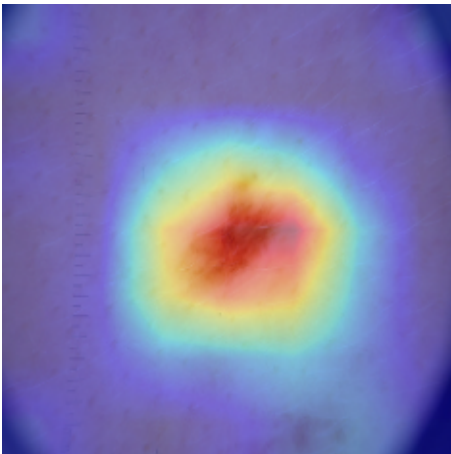### Original Image

Grad-CAM Explanation

LIME Explanation

Integrated Gradients Explanation

Class Activation Mapping

Shap
Not Available

The model was trained on the HAM10000 dataset which may not be representative of all skin types, conditions, or demographics. Performance can vary significantly based on image quality, lighting conditions, and skin characteristics.

Explanation methods like Grad-CAM, LIME, and Integrated Gradients provide insight into the model's decision-making process, but they are approximations and should be interpreted with caution.

For any concerns about skin lesions, please consult a qualified dermatologist. Early detection and proper medical assessment are crucial for skin cancer diagnosis and treatment.

About the Model:

Architecture: SkinLesionModel
Training Dataset: HAM10000
Classes: Melanocytic nevi (nv), Melanoma (mel), Benign keratosis (bkl), Basal cell carcinoma (bcc), Actinic keratoses (akiec), Vascular lesions (vasc), Dermatofibroma (df)

Explanations generated using multiple XAI (Explainable AI) techniques to provide a comprehensive understanding of the model's prediction.