

# Comprehensive Skin Lesion Analysis Report

Prediction: nv

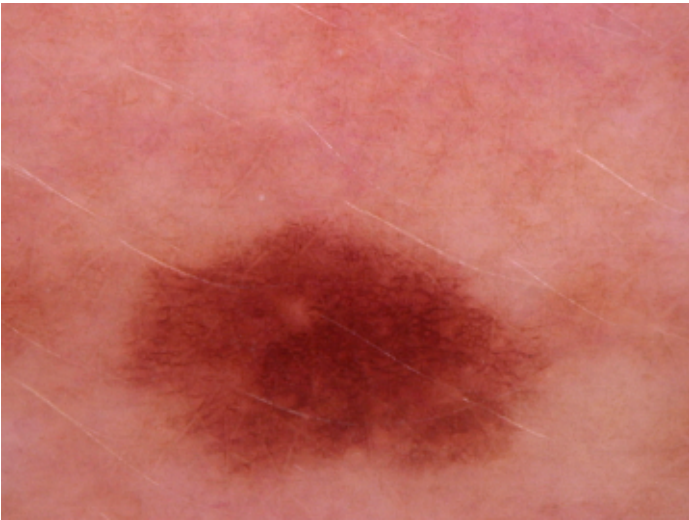
Confidence: 1.00

Generated on: 2025-03-19 12:33:59

This report is for research purposes only.

# Image and Predictions

Original Image



Full Prediction Confidence

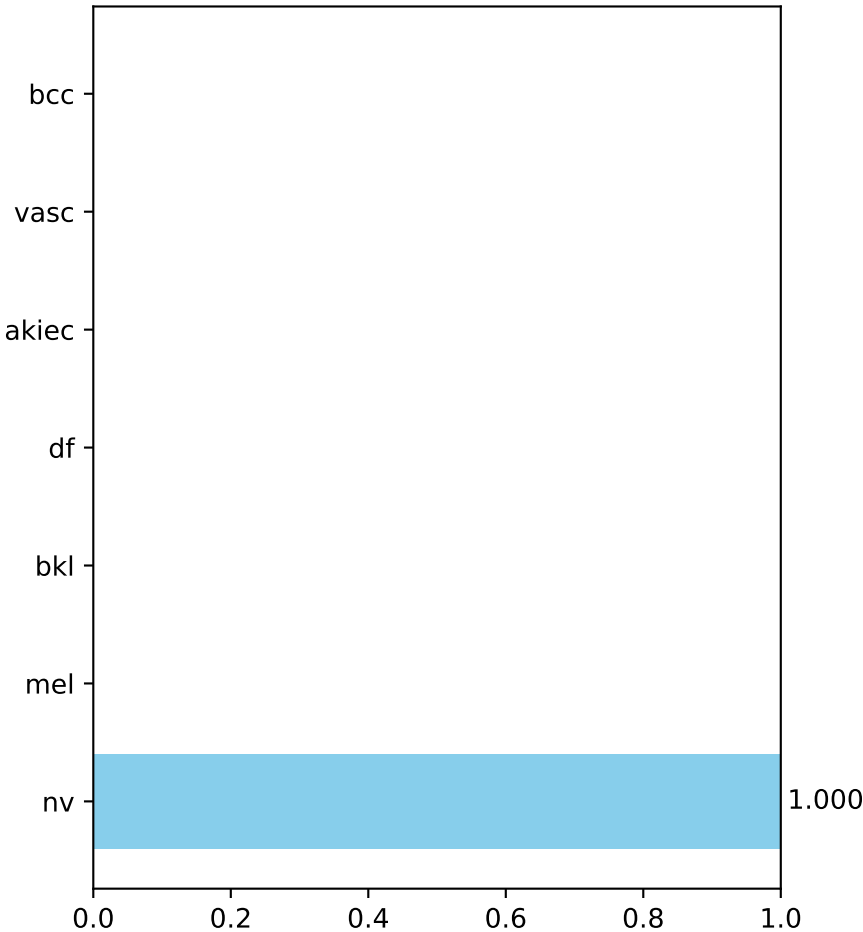
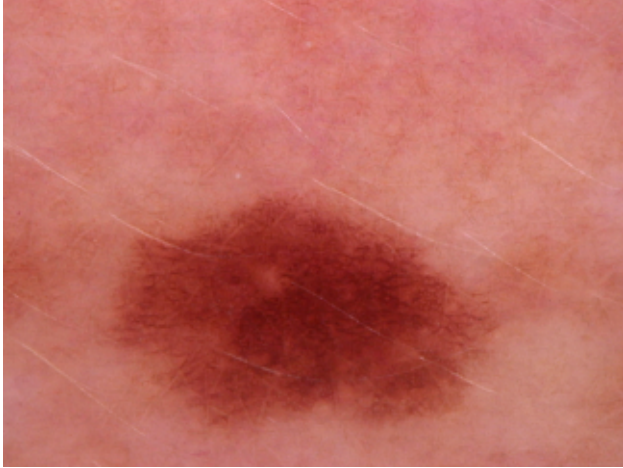


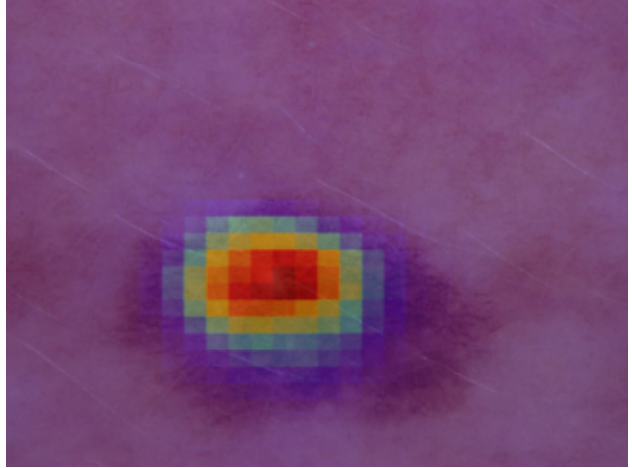
Image Name: example\_test  
Date Analyzed: 2025-03-19 12:33:59  
Model: SkinLesionModel  
Image Size: 450x600  
Top Predictions:  
1. nv: 0.9997  
2. mel: 0.0002  
3. bkl: 0.0001

# Grad-CAM Explanation

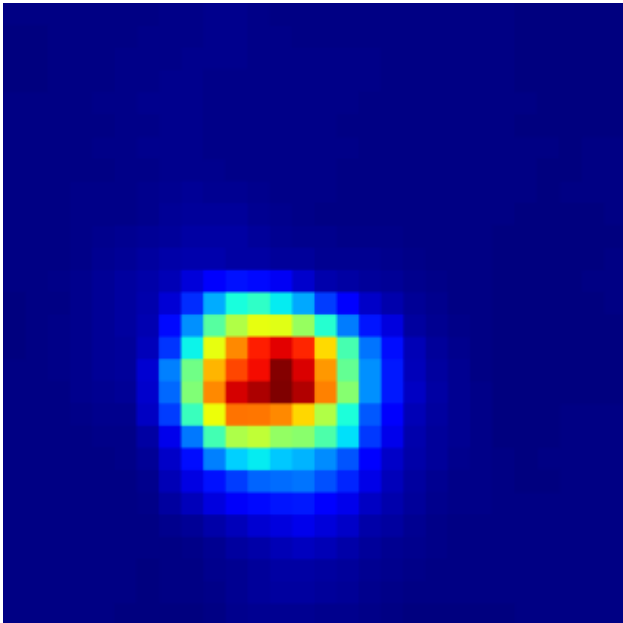
Original Image



Grad-CAM Explanation



Grad-CAM Explanation Heatmap

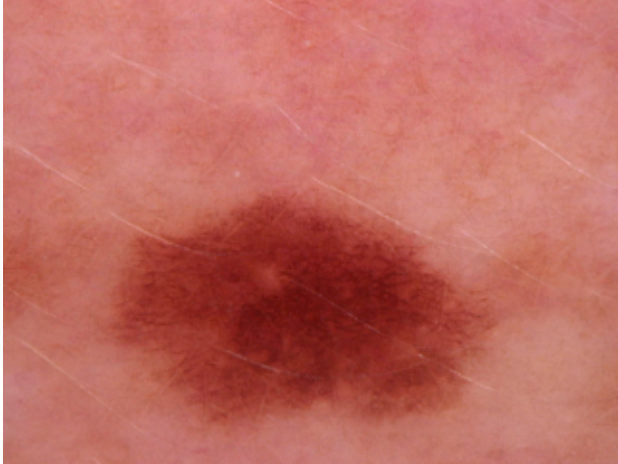


## Description:

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

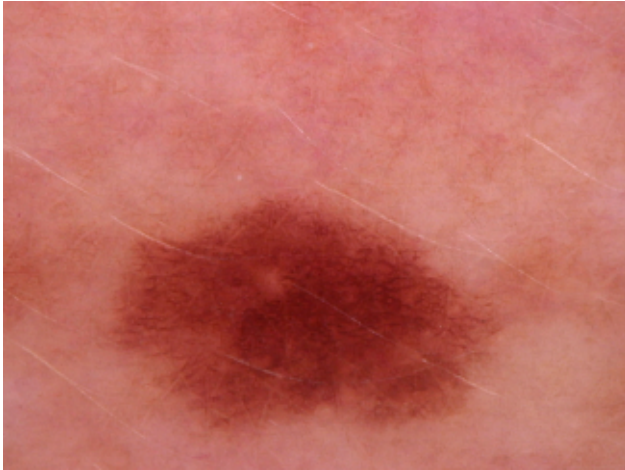


## Description:

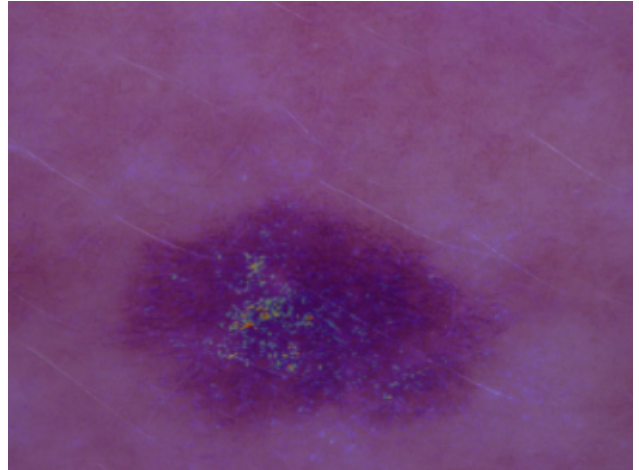
LIME (Local Interpretable Model-agnostic Explanations) perturbs the input image by segmenting it and turning segments on or off. It then fits a simple model to approximate how the segments affect the model's prediction. Green regions positively contribute to the prediction, while red regions negatively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

# Integrated Gradients Explanation

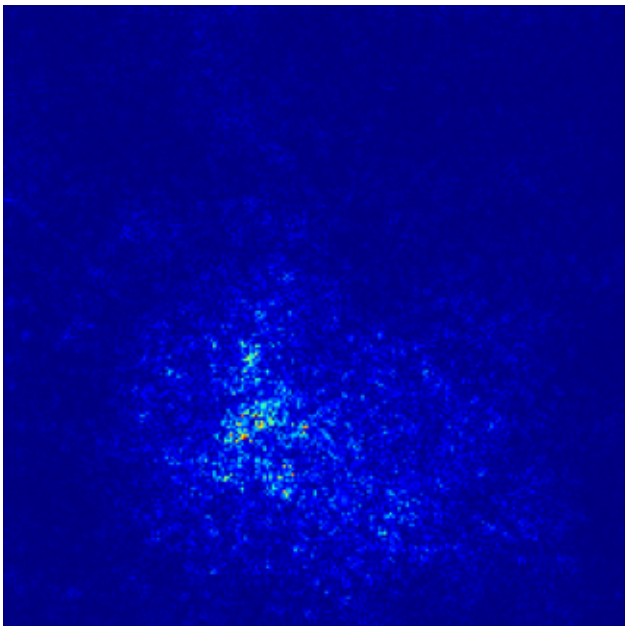
Original Image



Integrated Gradients Explanation



Integrated Gradients Explanation Heatmap

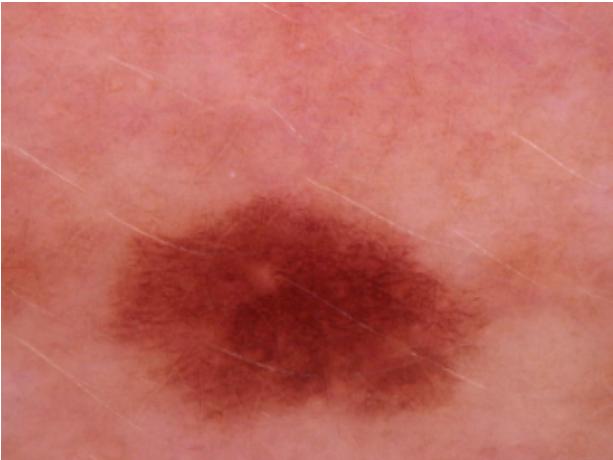


## Description:

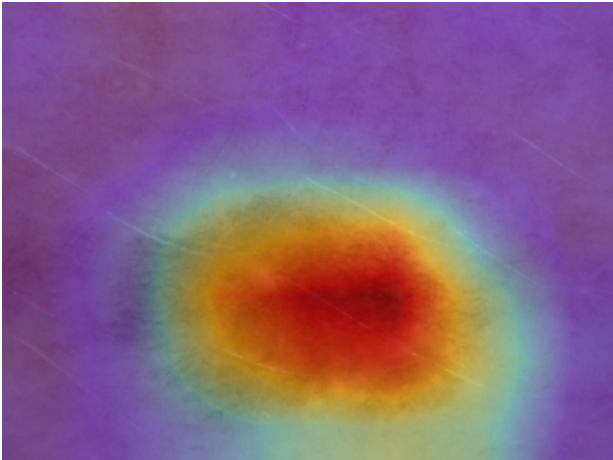
Integrated Gradients computes the path integral of the gradients along a straight line from a baseline image (usually black) to the input image. This provides a pixel-level attribution map showing the contribution of each pixel to the prediction.

# Class Activation Mapping

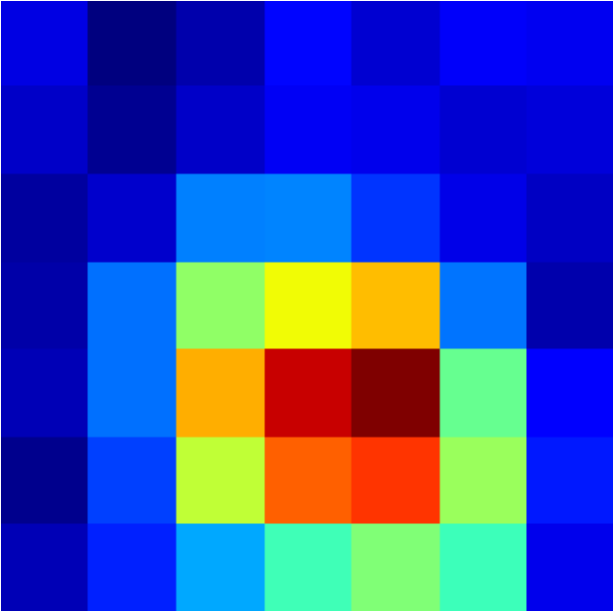
Original Image



Class Activation Mapping



Class Activation Mapping Heatmap

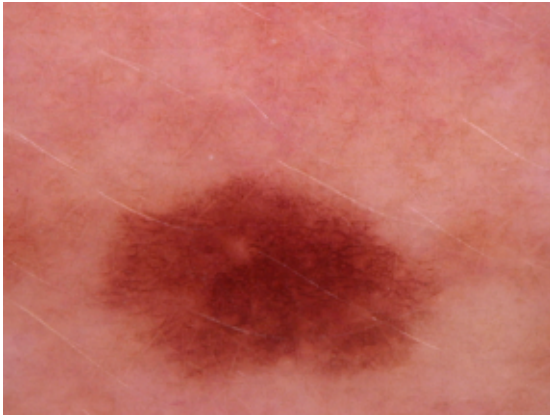


## Description:

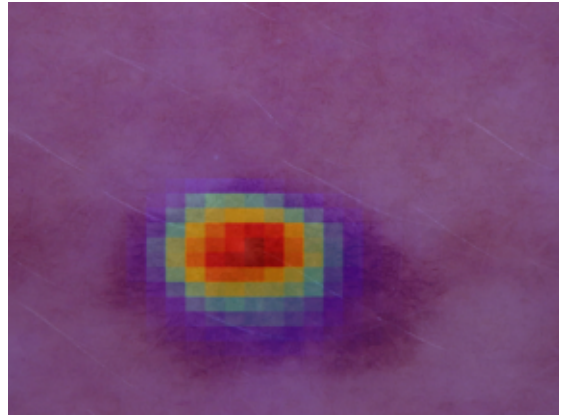
Class Activation Mapping (CAM) visualizes the class-specific feature maps in the last convolutional layer. It shows which regions of the image were most important for the model's prediction of the specific class.

# Comparison of All Explanation Methods

Original Image



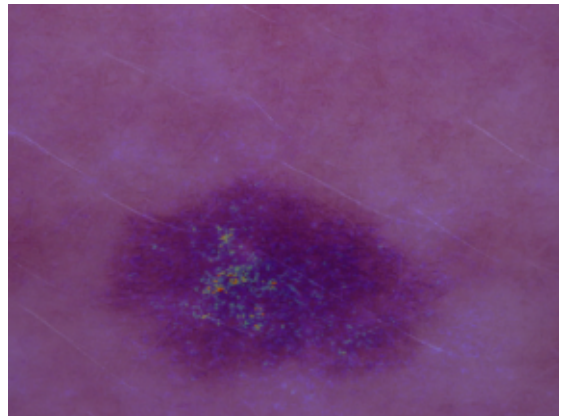
Grad-CAM Explanation



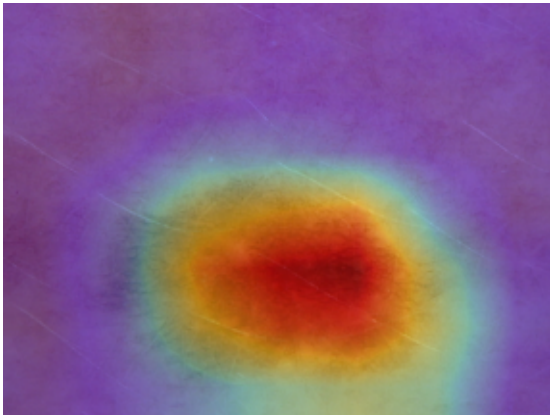
LIME Explanation



Integrated Gradients Explanation



Class Activation Mapping



Shap  
Not Available



## DISCLAIMER:

# Important Information

This report was generated by an artificial intelligence system for research purposes only. The predictions and explanations provided should not be used for clinical diagnosis or treatment decisions without proper medical supervision.

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.