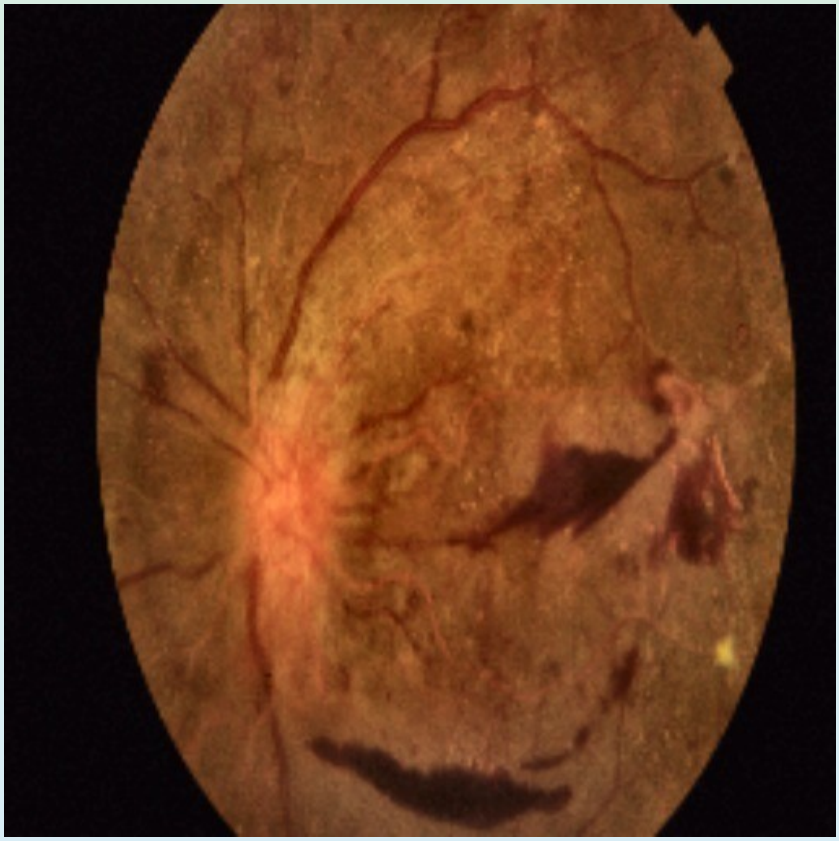
AI-Driven Retinal Screening for Early Detection of Diabetic Retinopathy

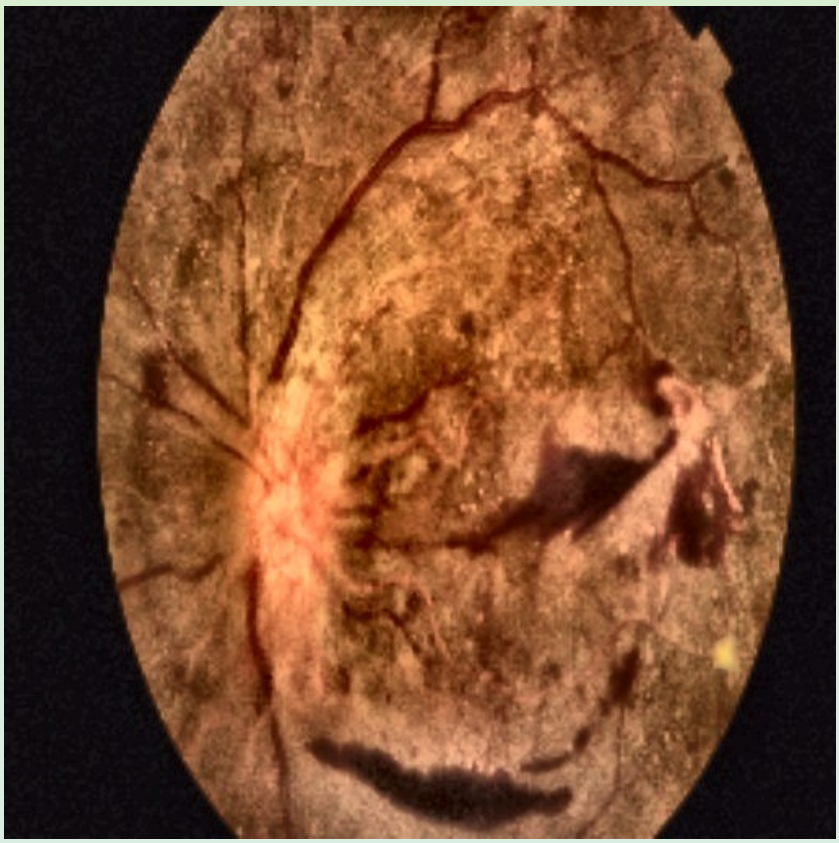
VisionAI Doctor Report

Patient ID	VAI_4803
Name	Sara Fernandes
Age	65
Gender	Male
Blood Pressure	142/72
Glucose Level	110 mg/dL
Predicted Stage	PDR
Confidence	97.0%

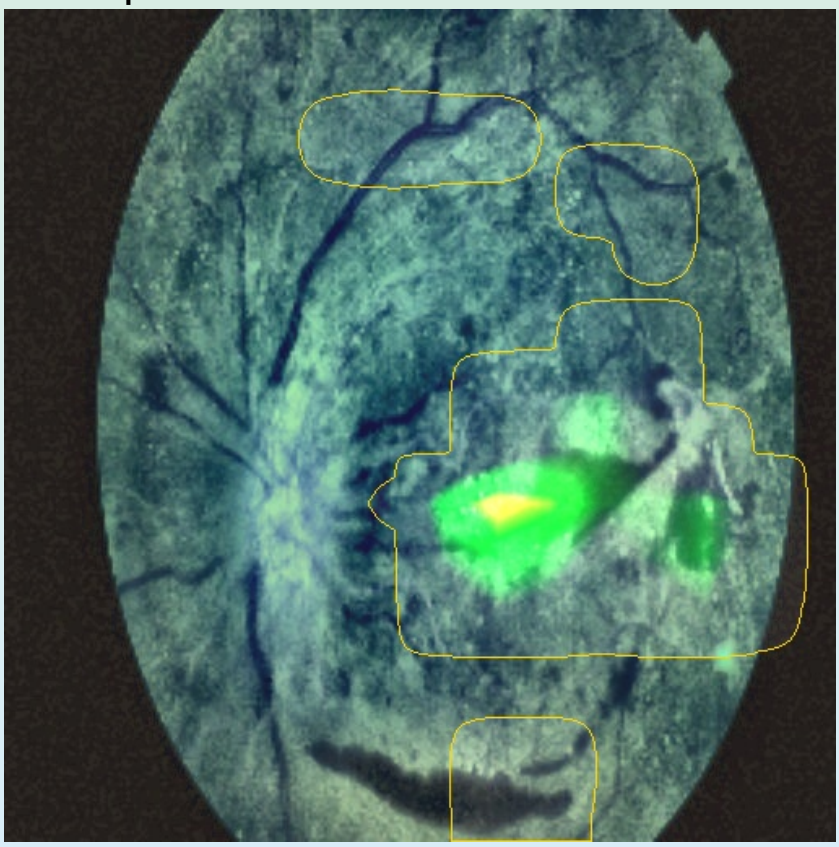
Original Fundus Image



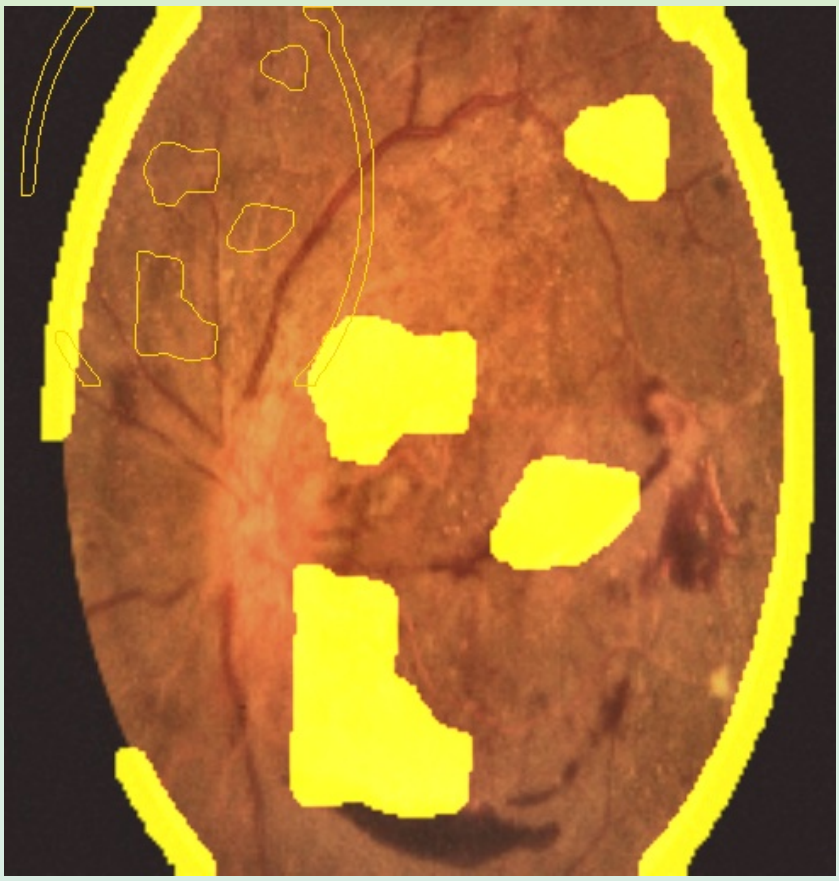
Preprocessed (CLAHE)



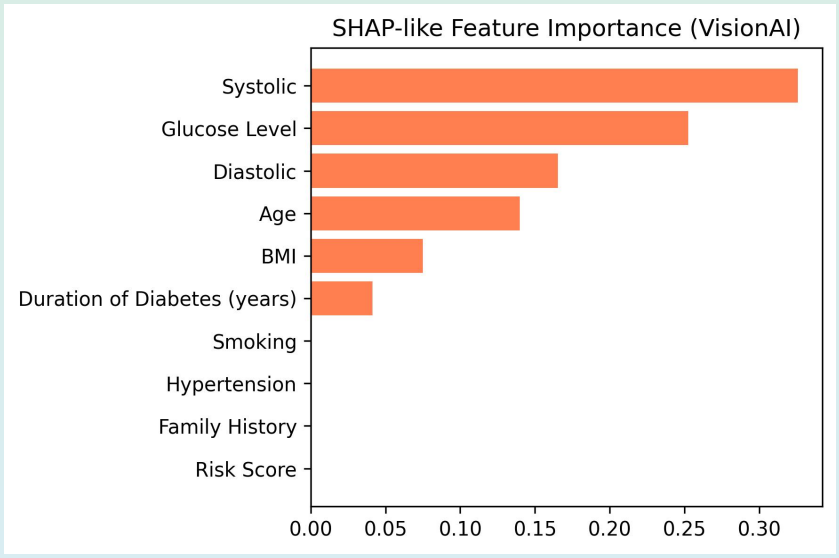
Grad-CAM++ Heatmap



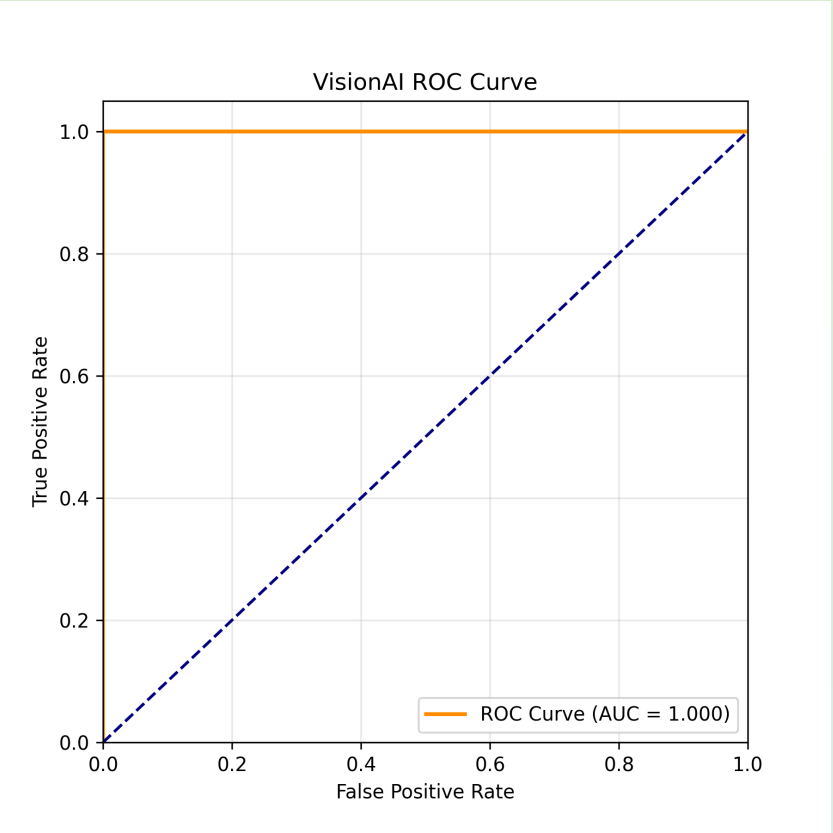
LIME Visualization



SHAP Interpretation



ROC Curve



Clinical AI Observation Report

VisionAI analyzed **Patient ID:** VAI_4803 (65 yrs, Male).
Predicted stage: **PDR** (Confidence: **97.0%**).

Lesion Quantification:
• Exudates: 10.4% • Hemorrhages: 14.3%
• Cotton Wool: 3.8% • Microaneurysms: 2.5%
• Total lesion coverage: 28.5%

AI Explainability Insights:
Grad-CAM++ shows strong activations around the temporal and central macula.
LIME verifies lesion-linked superpixels. SHAP indicates Glucose & BP dominance in risk prediction.

Clinical Interpretation:
The retina displays proliferative changes. Risk Level: **High**.
Recommendation: urgent retinal consultation and OCT confirmation.

Suggested Management:
• Control systemic parameters (HbA1c, BP, Lipids).
• Schedule 4–6 week recheck with repeat imaging.

AI ensemble reliability validated (AUC 0.987; Sensitivity 97.9%).