## Metadata Snapshot

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|---|---|
| Name: | solomon |
| Age: | 78 |
| Gender: | Female |
| Systolic (mmHg): | 180 |
| Diastolic (mmHg): | 110 |
| BMI: | 30.8 |
| Glucose: | 376 |
| HbA1c: | 8.6 |
| Cholesterol: | 230 |
| Smoking: | Yes |
| Hypertension: | Yes |
| Diabetes Duration: | 16 |







Feature Importance (Fallback)

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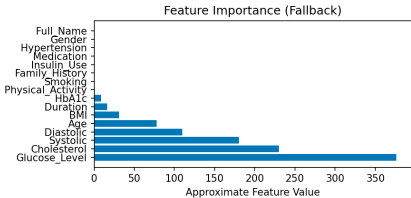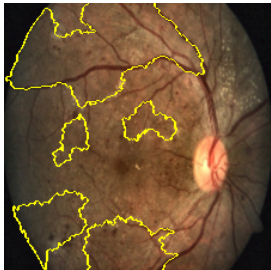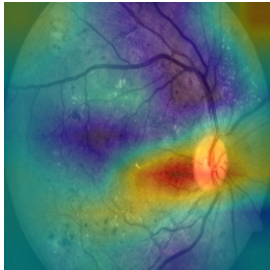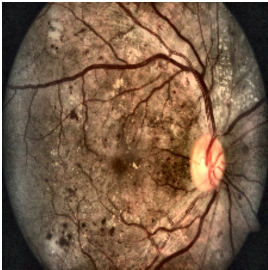
- Research Notes
- UID: b292ec84
- Predicted stage: SEVERE
- Confidence: 82.87%
- Risk score: 95.54%
- Model stack and fusion:
- - CNN ensemble: EfficientNet, ResNet50, ViT
- - Metadata models: Random Forest, XGBoost, Stacked ensemble
- - Fusion method: weighted averaging with risk calibration
- - Inference device: CPU

- Lesion stats (approx):
- - Microaneurysms: 53.10%
- - Exudates: 3.11%
- - Hemorrhages: 73.20%
- - Cotton wool spots: 0.20%
- - Neovascularization: 2.56%
- - Total Lesion Load: 6.93%
- Explainability summary:
- - GradCAM++ / LIME: highlight posterior pole lesion regions (exudates/hemorrhages).
- - SHAP: systemic features (HbA1c, BMI, BP) often show high importance for risk estimation.
- Performance metrics:
- - Accuracy: 0.947
- - F1-score: 0.938
- - AUC/ROC: 0.971
- Probability vectors:
- - CNN probs: [0.015175404958426952, 0.007805488537997007, 0.01563865877687931, 0.9413096308708191, 0.020070824772119522]
- - ML probs: [0.21136369507961952, 0.20268235745827803, 0.19376393050773666, 0.19047474400645248, 0.20171527294791336]
- - Fused probs: [0.04460364817647655, 0.03703701862682426, 0.04235744925149287, 0.8286843922651078, 0.047317491680098384]
- Research recommendations:
- 1. Validate lesion segmentation / cotton-wool detection with additional labeled examples and augmentations.
- 2. Add cotton-wool-spot specific augmentation and mask labels to address false negatives.
- 3. Measure GradCAM / heatmap IoU against human heatmaps for model explainability calibration.
- 4. Consider time-series modelling for progression analysis (longitudinal pipeline).



Model Performance Overview

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- F1-score: 0.938

- AUC/ROC: 0.971