Preventing Blindness In The US With AI Models: Early Eye Disease Detector

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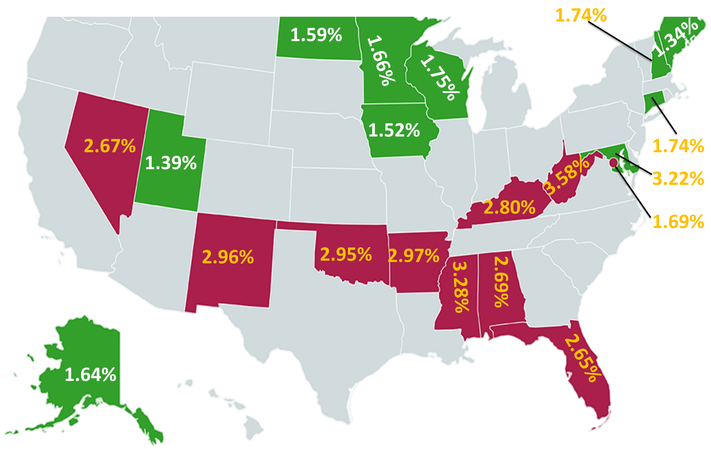
INTRODUCTION

In this project, I developed an eye disease detector using a deep learning model to classify images of healthy and diseased eyes; a crucial task in ophthalmology that demonstrates the potential of computer vision in medical diagnostics. Using convolutional neural networks (CNNs), I trained models to distinguish between multiple eye conditions. My final models demonstrates the promise of AI-driven eye disease detection, offering a step toward automated screening tools that could assist healthcare professionals in early diagnosis and treatment planning.



HIGHEST AND LOWEST STATES BASED ON VISUAL ACUITY LOSS

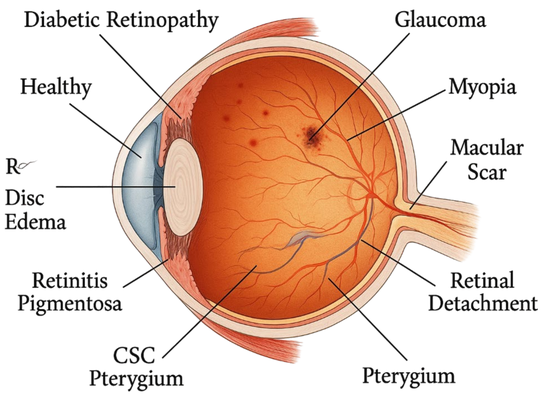
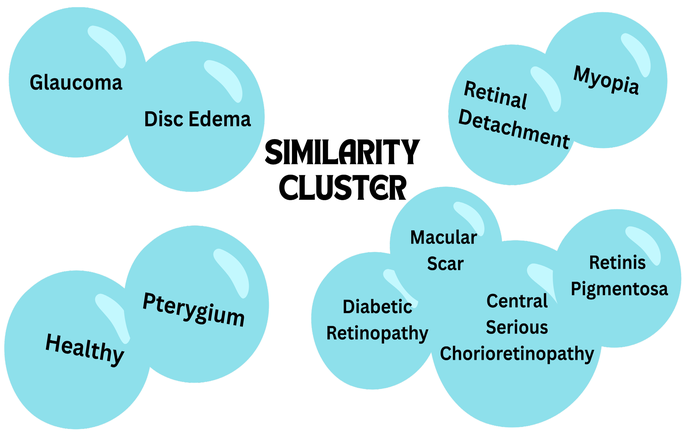
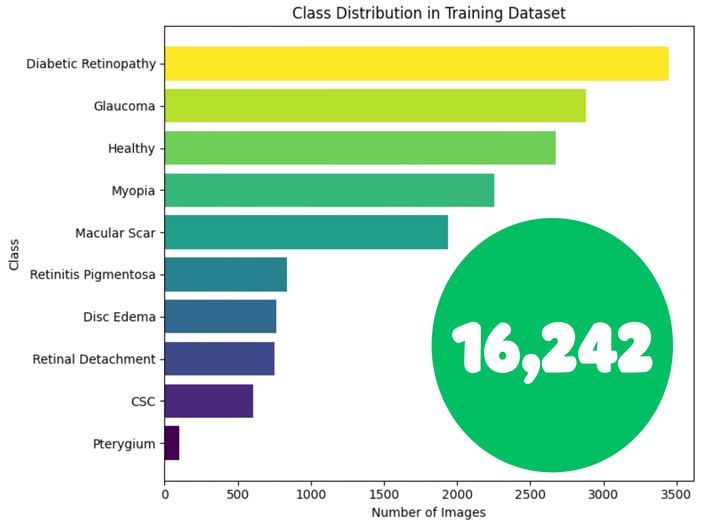


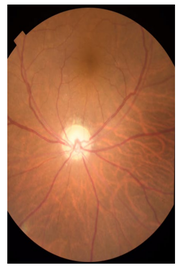
DIAGRAM OF THE EYE SHOWING DISEASE SPOTS



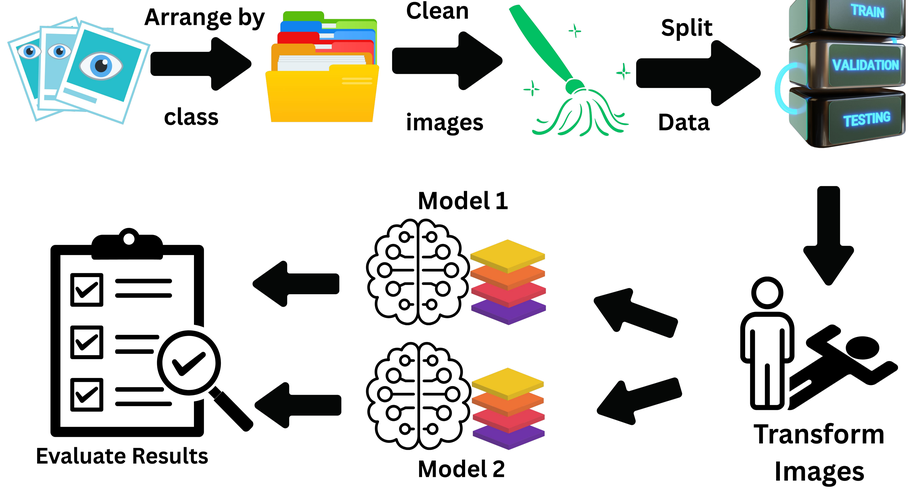
METHODOLOGY



Inappropriate Pterygium Image

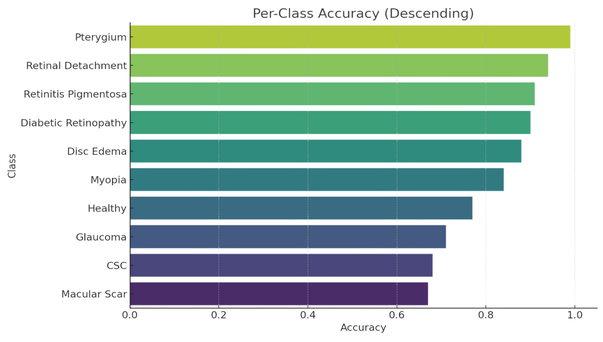


Appropriate Image

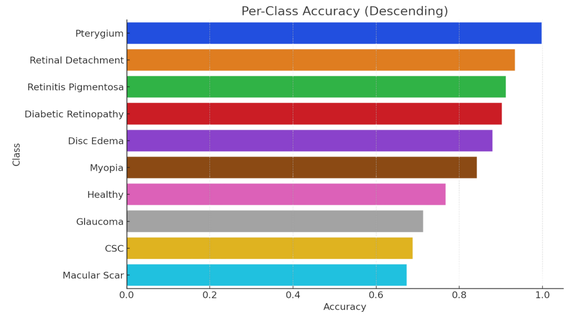


RESULTS AND GRADCAM VISUAL

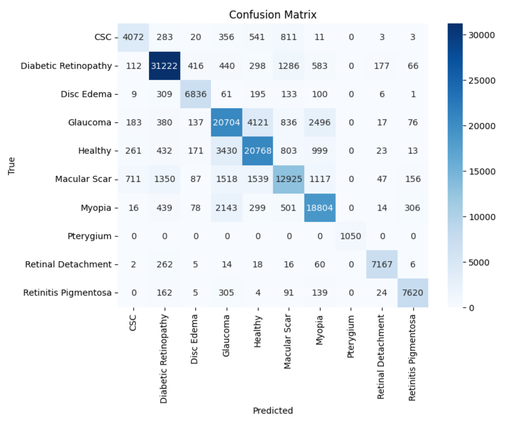
DenseNet
Overall Accuracy = 80.37%



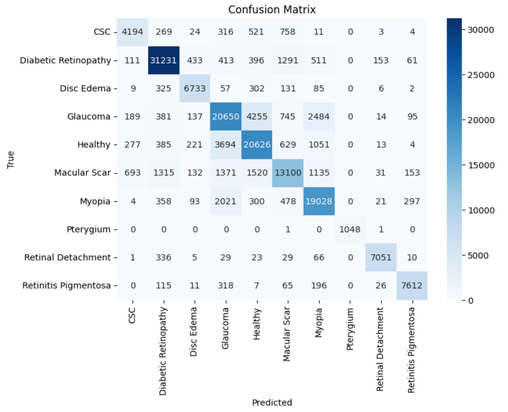
MobileNet
Overall Accuracy = 80.44%

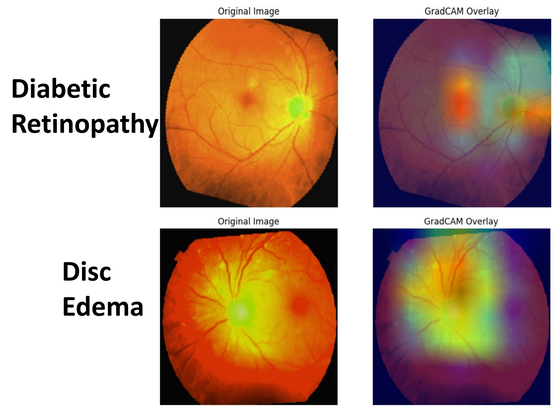


DENSENET



MOBILENET





CONCLUSION AND DISCUSSION

- Correlation can be seen between visual loss and warmer regions in the United States.
- Diabetic Retinopathy can be easily misclassified as Macular Scar due to similar focal damage in the retina. Still, the models do a great job at handling these two classes.