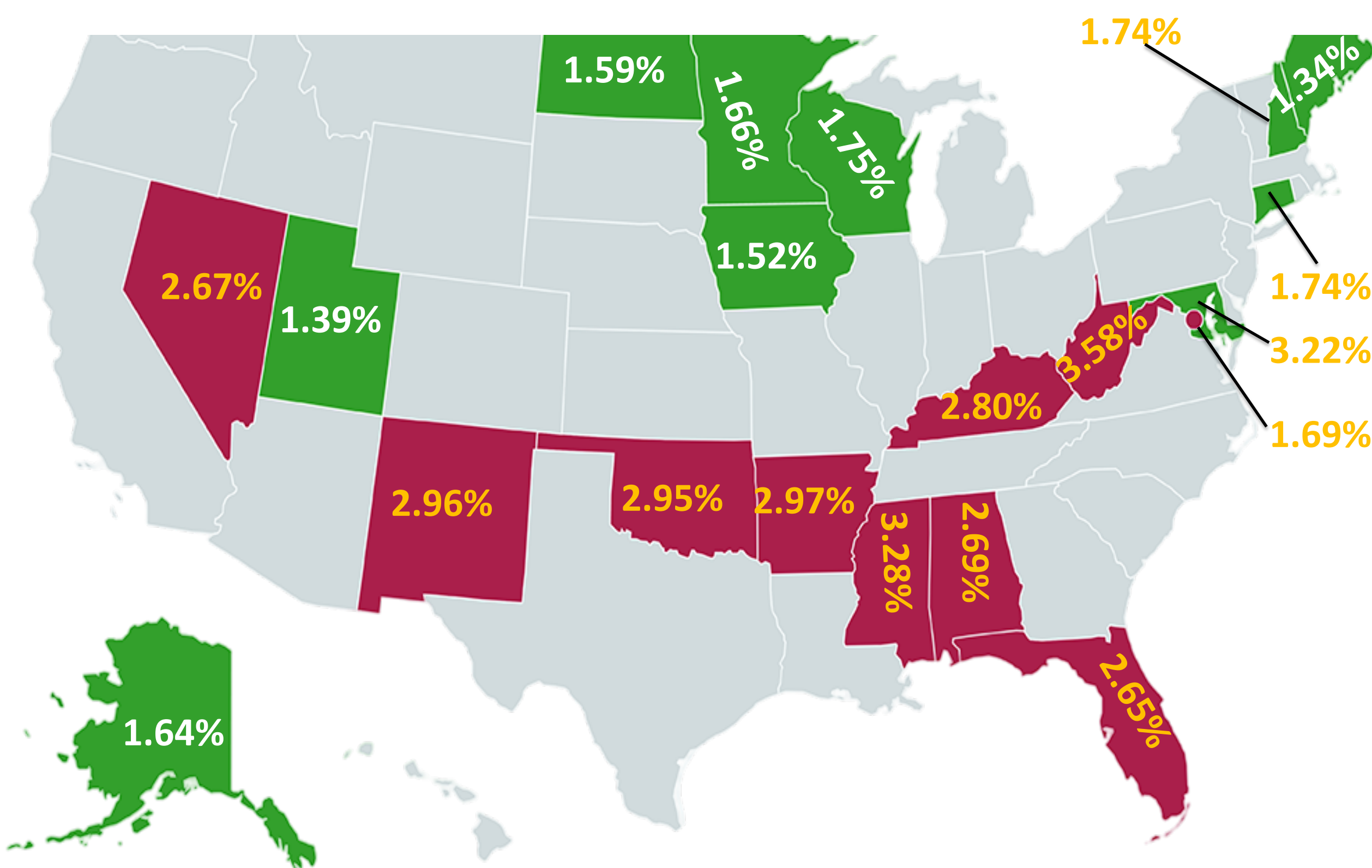


INTRODUCTION

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

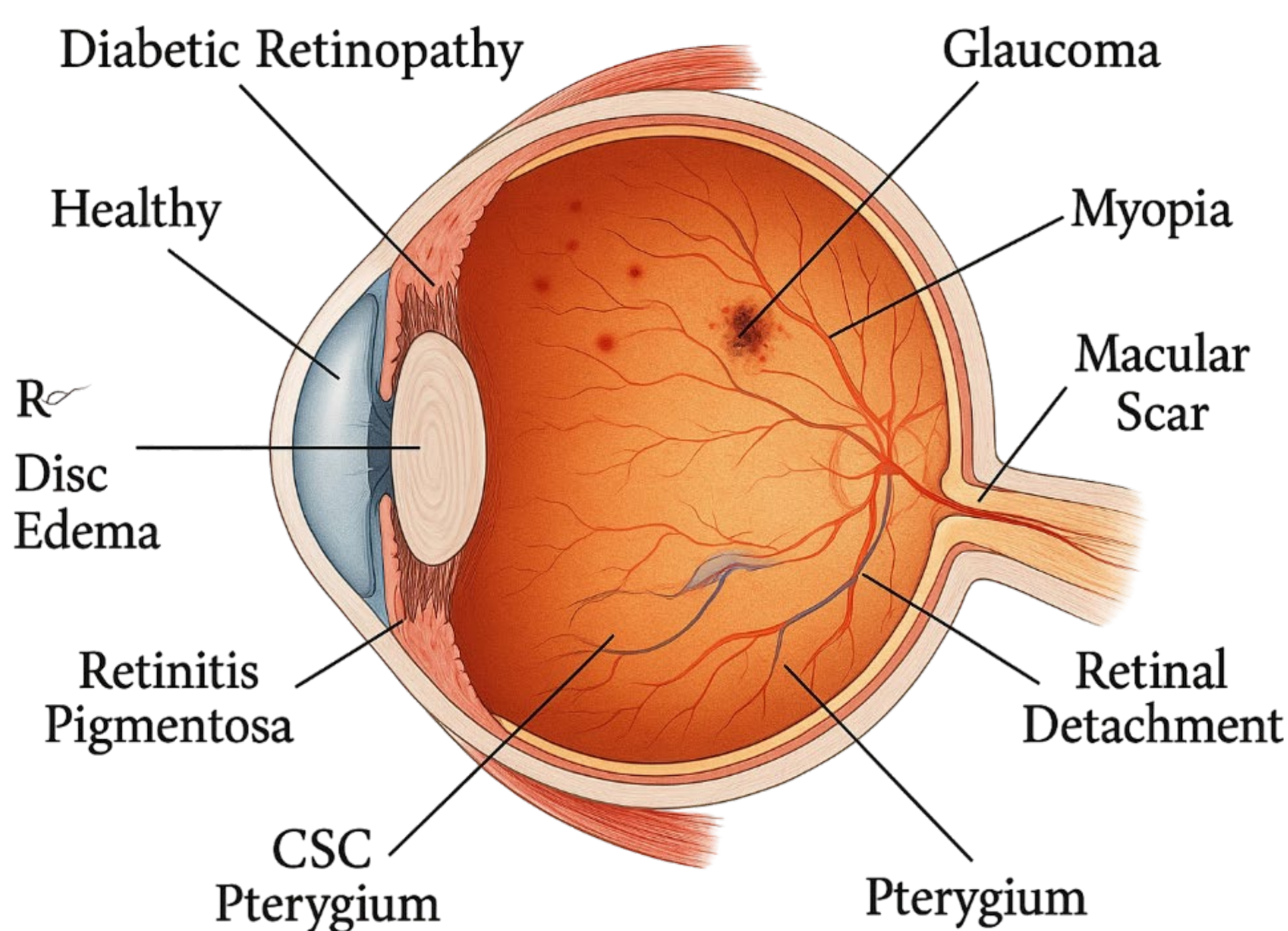
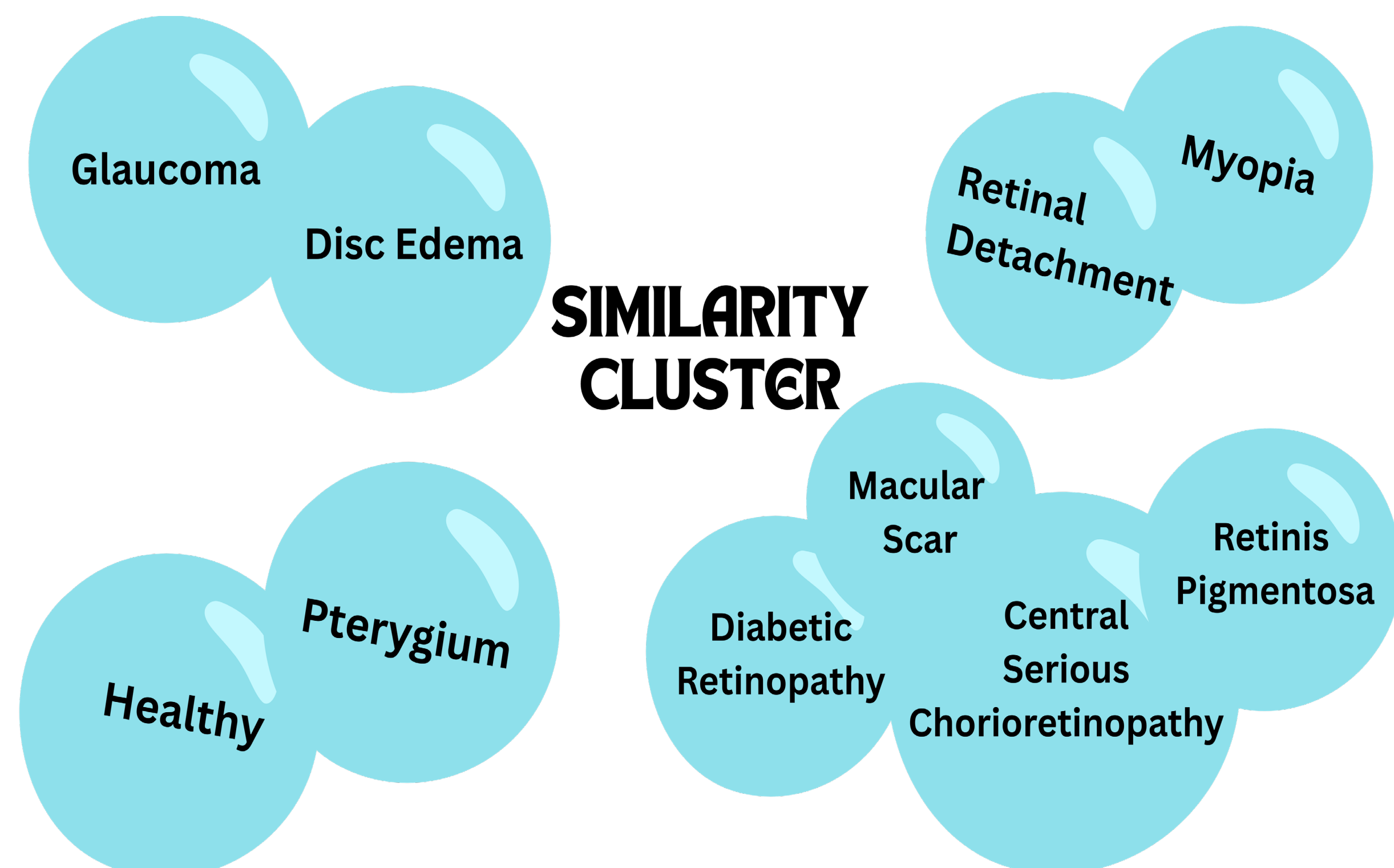
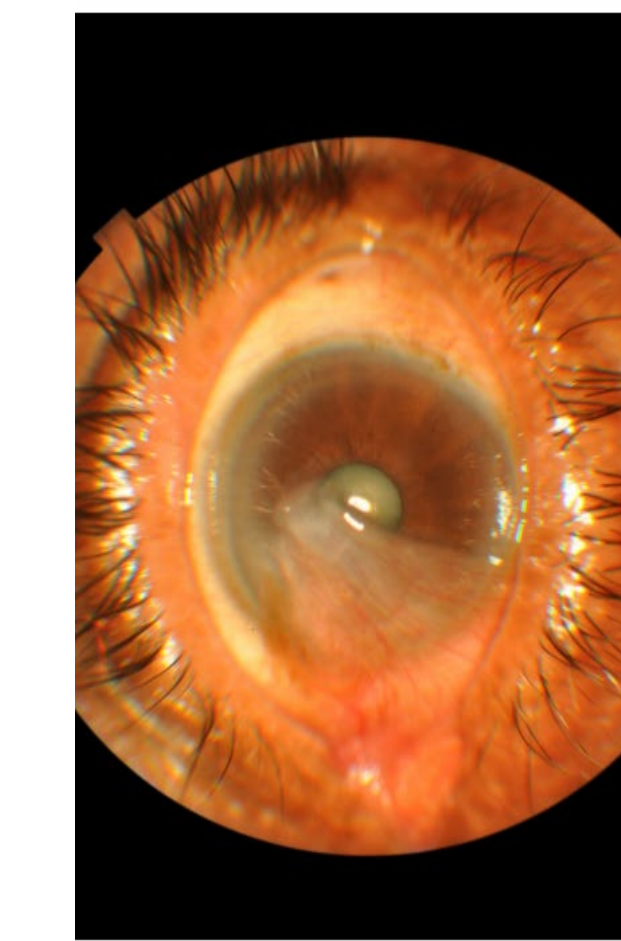
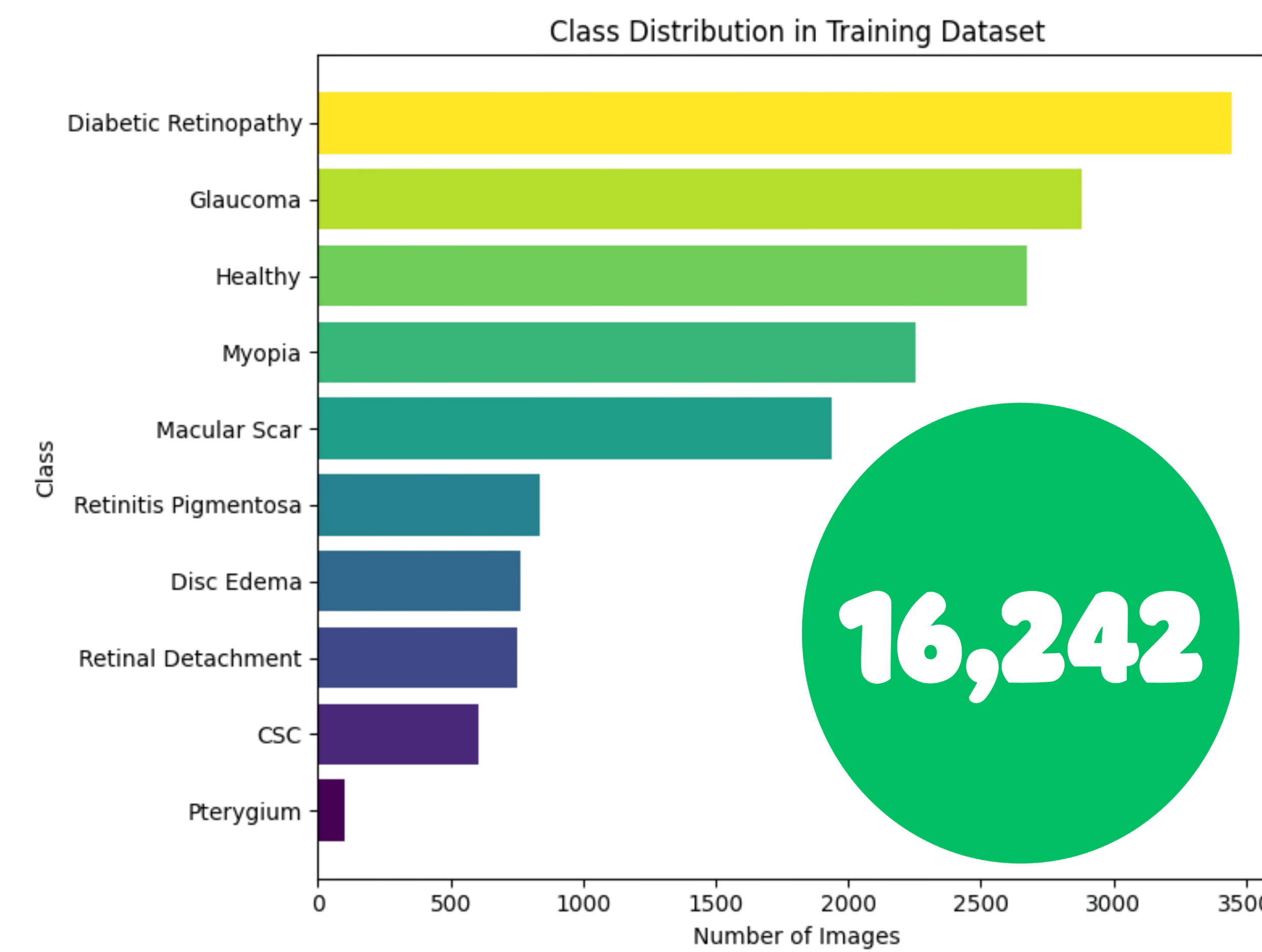


DIAGRAM OF THE EYE SHOWING DISEASE SPOTS

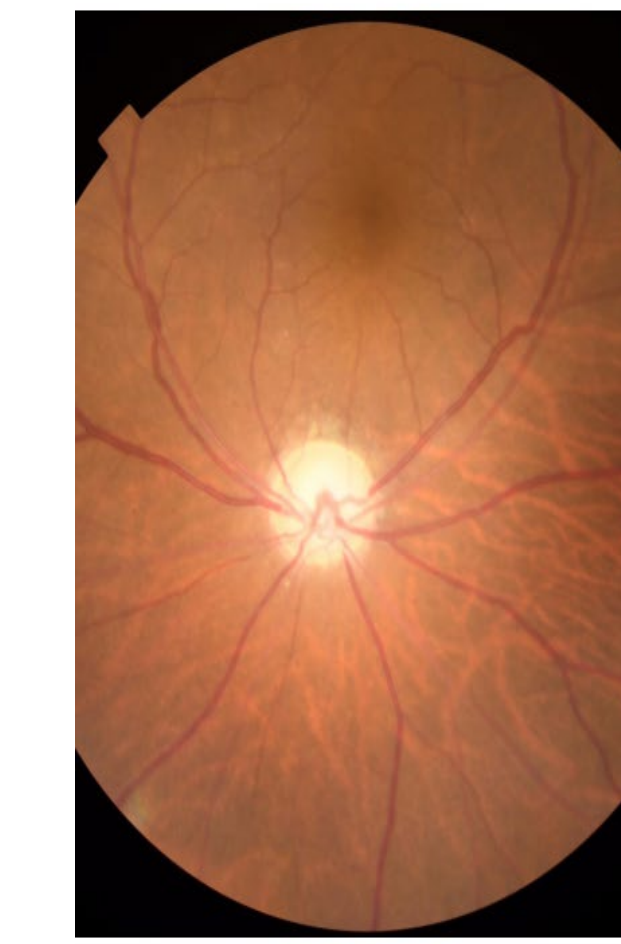


SIMILARITY CLUSTER

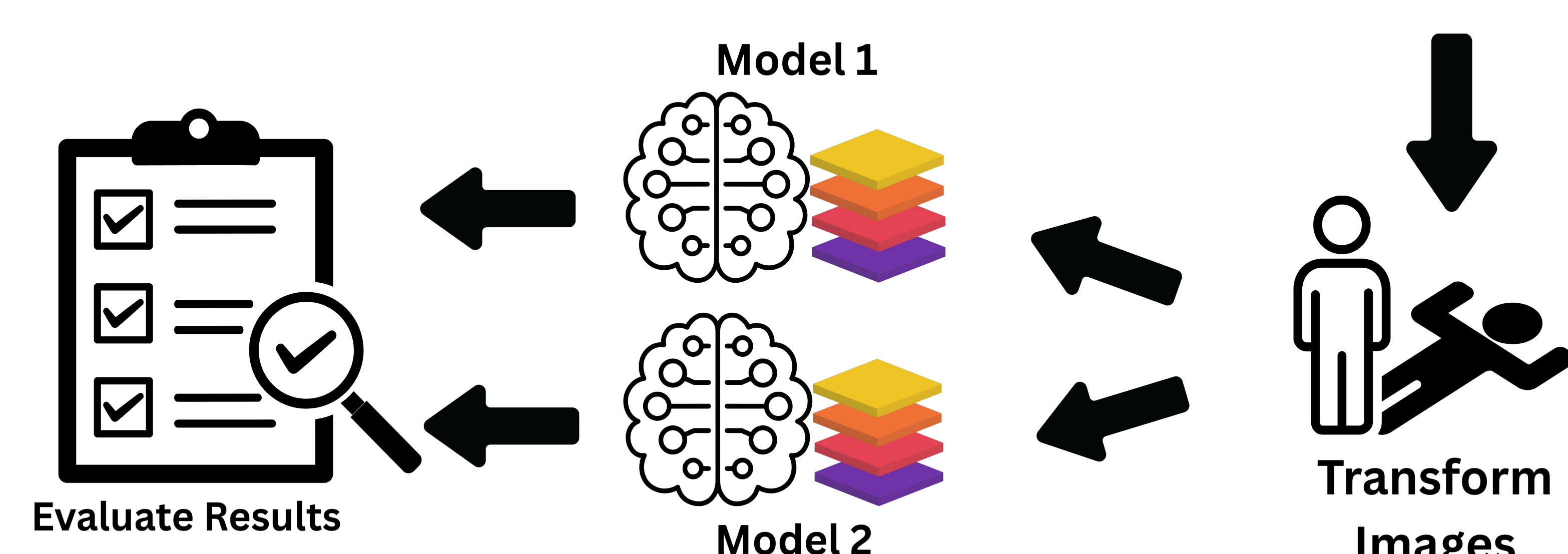
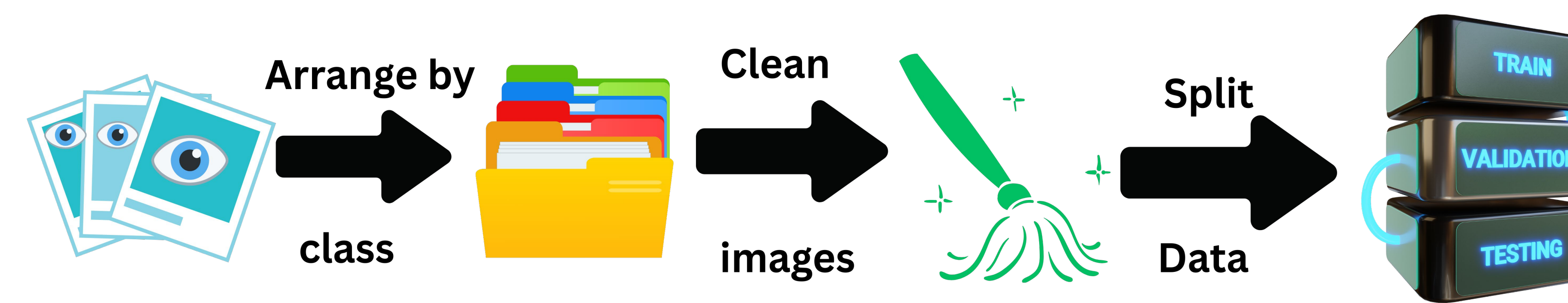
METHODOLOGY



Inappropriate Pterygium Image

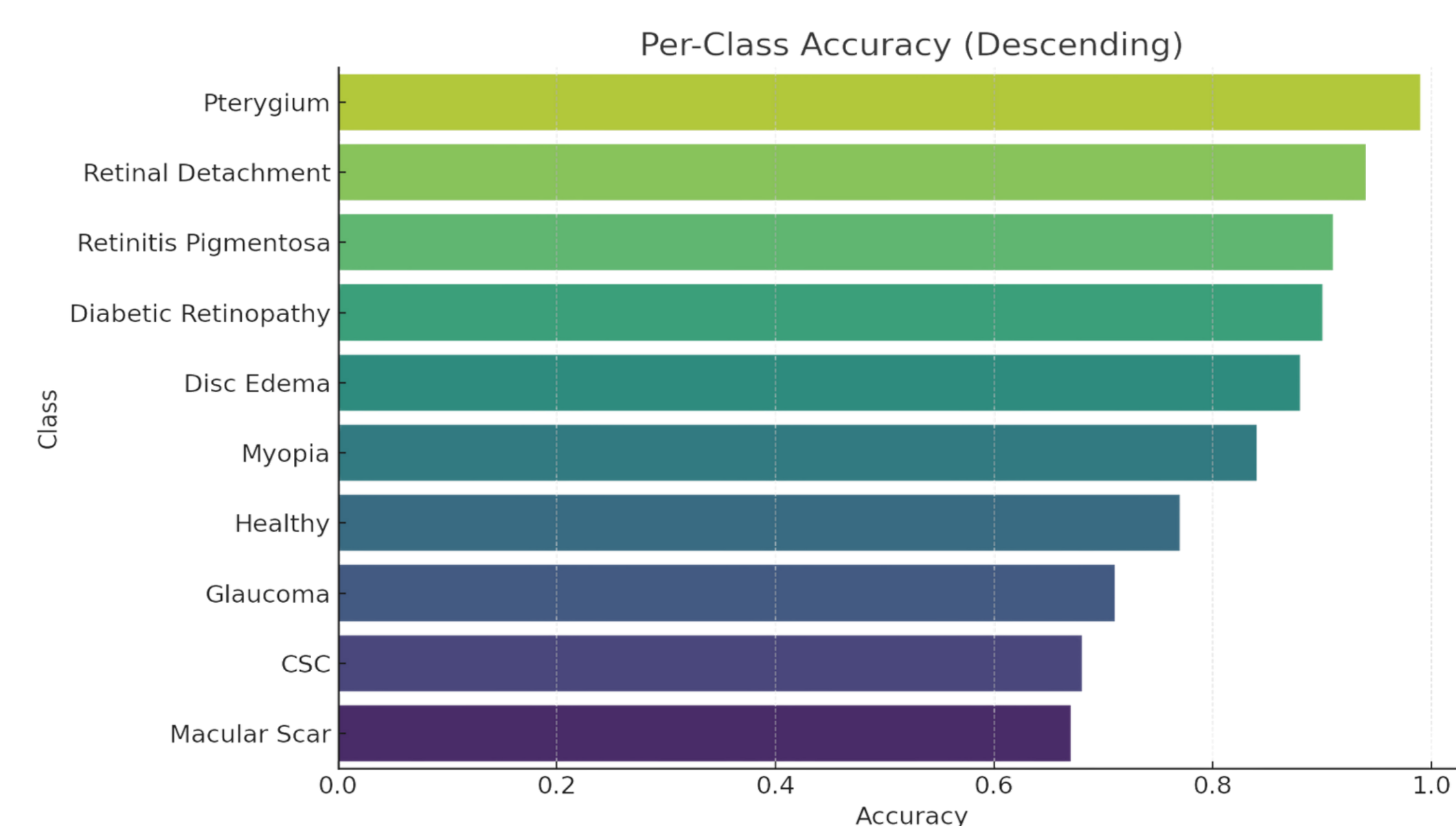


Appropriate Image

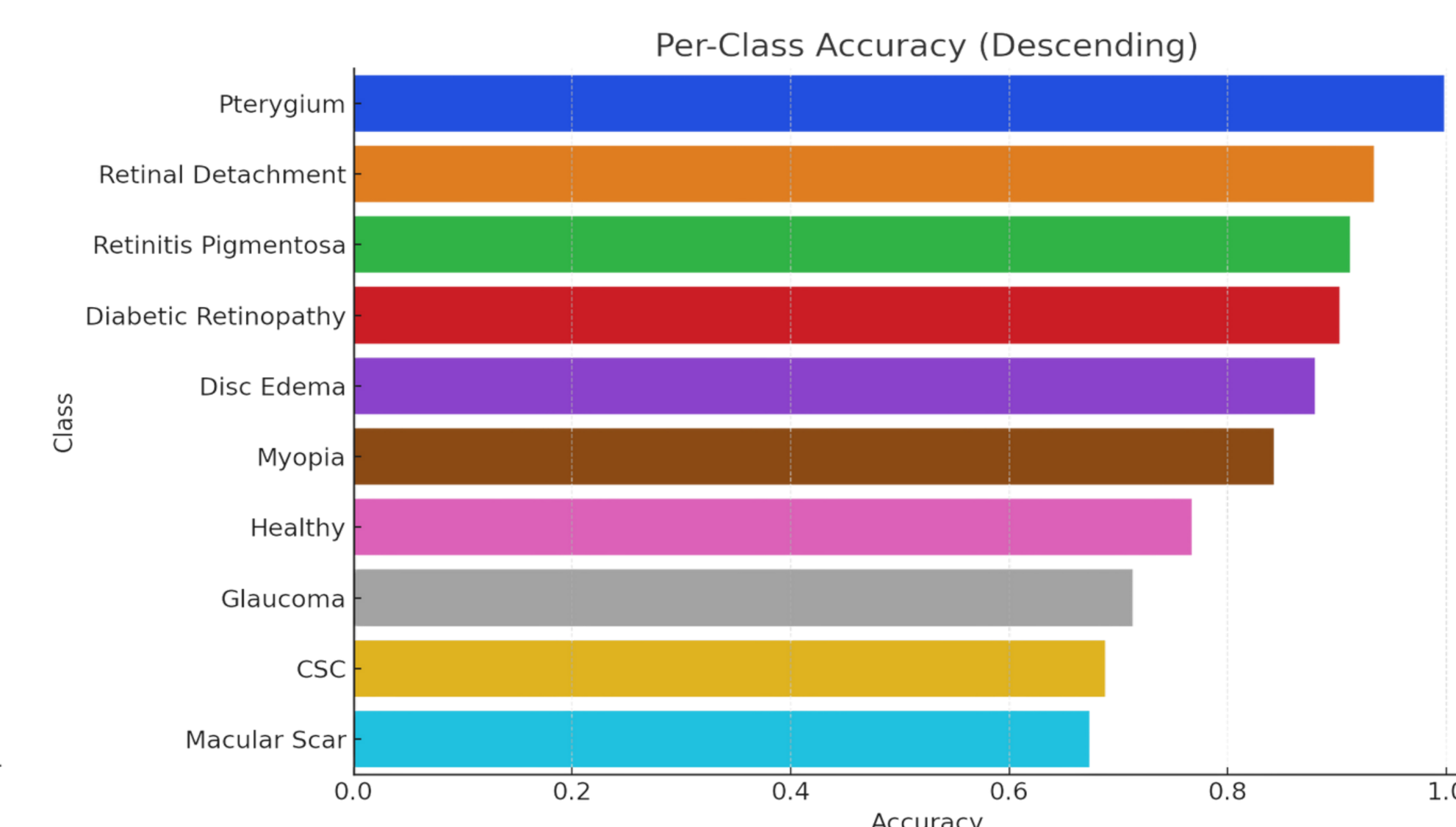


RESULTS AND GRADCAM VISUAL

DenseNet
Overall Accuracy = 80.37%



MobileNet
Overall Accuracy = 80.44%



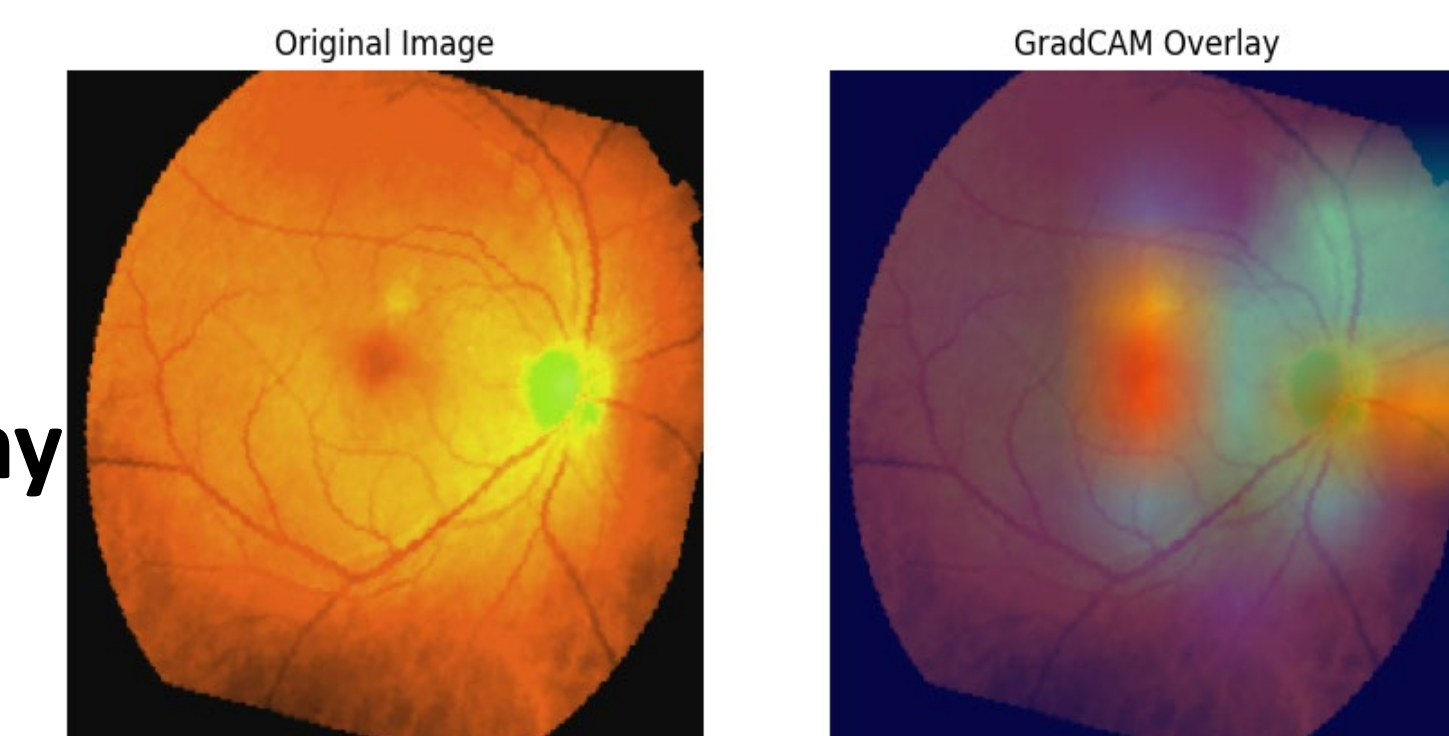
DENSENET

		Confusion Matrix										
True	CSC	4072	283	20	356	541	811	11	0	3	3	
	Diabetic Retinopathy	112	31222	416	440	298	1286	583	0	177	66	
	Disc Edema	9	309	6836	61	195	133	100	0	6	1	
	Glaucoma	183	380	137	20704	4121	836	2496	0	17	76	
	Healthy	261	432	171	3430	20768	803	999	0	23	13	
	Macular Scar	711	1350	87	1518	1539	12925	1117	0	47	156	
	Myopia	16	439	78	2143	299	501	18804	0	14	306	
	Pterygium	0	0	0	0	0	0	0	1050	0	0	
	Retinal Detachment	2	262	5	14	18	16	60	0	7167	6	
	Retinitis Pigmentosa	0	162	5	305	4	91	139	0	24	7620	
		CSC	Diabetic Retinopathy	Disc Edema	Glaucoma	Healthy	Macular Scar	Myopia	Pterygium	Retinal Detachment	Retinitis Pigmentosa	
		Predicted										

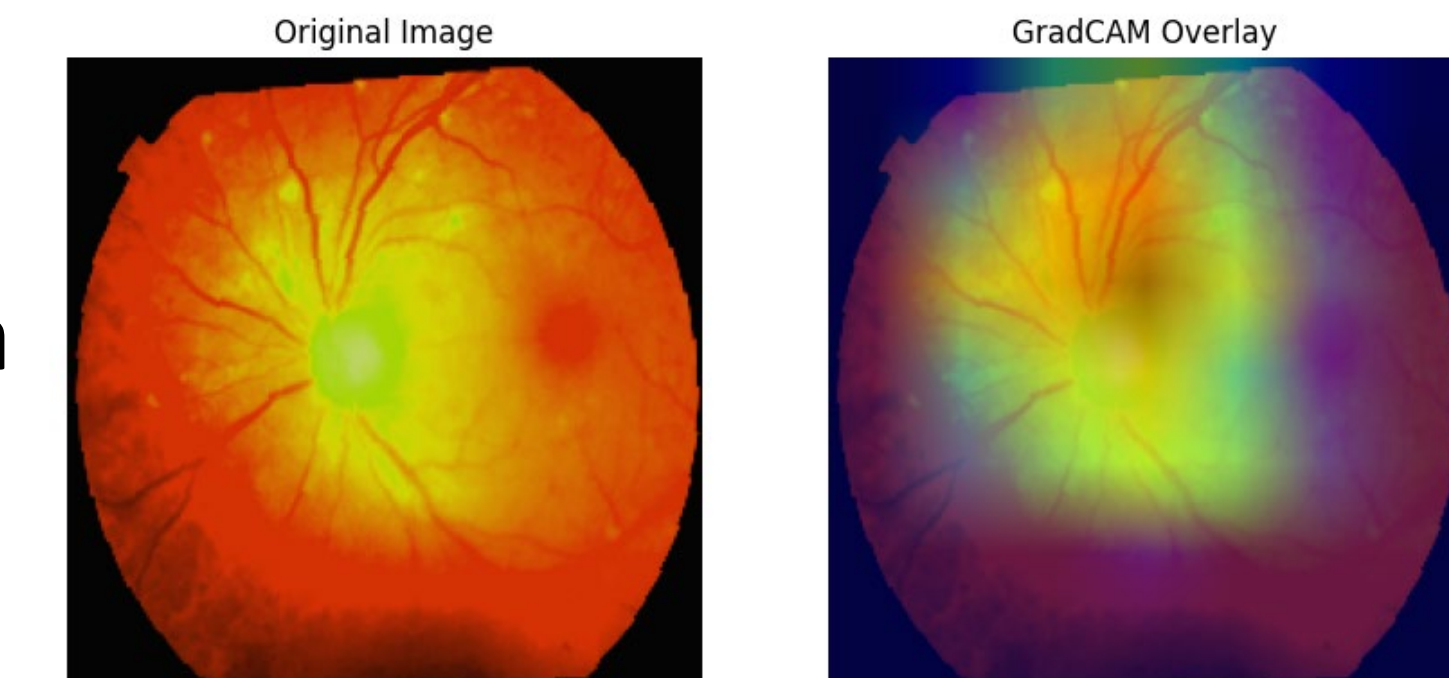
MOBILENET

		Confusion Matrix										
True	CSC	4194	269	24	316	521	758	11	0	3	4	
	Diabetic Retinopathy	111	31231	433	413	396	1291	511	0	153	61	
	Disc Edema	9	325	6733	57	302	131	85	0	6	2	
	Glaucoma	189	381	137	20650	4255	745	2484	0	14	95	
	Healthy	277	385	221	3694	20626	629	1051	0	13	4	
	Macular Scar	693	1315	132	1371	1520	13100	1135	0	31	153	
	Myopia	4	358	93	2021	300	478	19028	0	21	297	
	Pterygium	0	0	0	0	0	1	0	1048	1	0	
	Retinal Detachment	1	336	5	29	23	29	66	0	7051	10	
	Retinitis Pigmentosa	0	115	11	318	7	65	196	0	26	7612	
		CSC	Diabetic Retinopathy	Disc Edema	Glaucoma	Healthy	Macular Scar	Myopia	Pterygium	Retinal Detachment	Retinitis Pigmentosa	
		Predicted										

Diabetic Retinopathy



Disc Edema



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.