DIABETIC RETINOPATHY PREDICTION USING DEEP LEARNING

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Abstract

I. Introduction

1.1 Background of the project

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a. Dataset

For this research project I'm using dataset available at Kaggle("Diabetic Retinopathy Detection," n.d.). This Retinal images were provided by EyePACS. The dataset containing large set of high-resolution retina images taken under a variety of imaging conditions. For each image, a left and right field is provided. Images are identified by a image id and either the left or right eye (for example, 1 left.jpeg represents the patient number 1's left eye).

Table 1: ("Diabetic Retinopathy - Stages" 2017)

| DR classes	Level	Description
No DR	0	Healthy Retina (Normal)
Mild	1	Retina with tiny bulges (microaneurysms)
Moderate	2	Retina with microaneurysms, higher risk of developing vision problems in the future
Severe	3	Retina with severe and widespread microaneurysms, including bleeding into the retina
Proliferative	4	New blood vessels and scar tissue have formed on your retina, which can cause significant bleeding and lead to retinal detachment
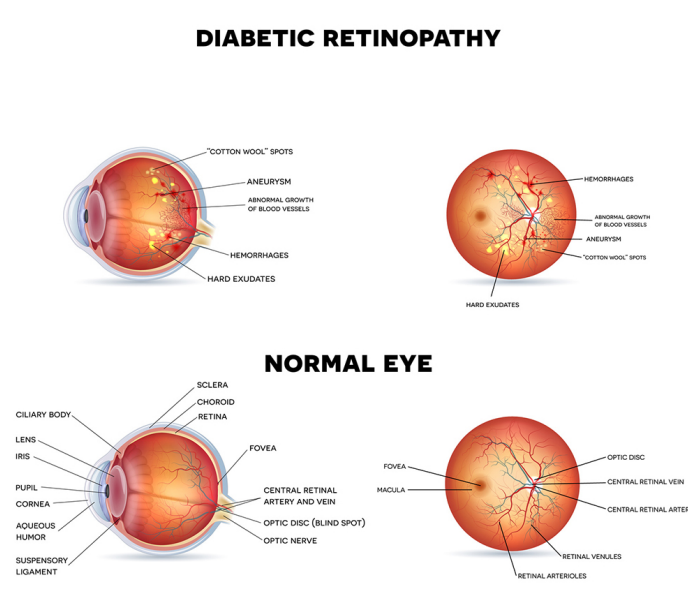
Figure 1: Normal Retina Vs Diabetic Retinopathy Retina ("Diabetic Retinopathy Vs Normal," n.d.)

b. Data pre-processing

The plot below illustrates the class imbalance in the original dataset.

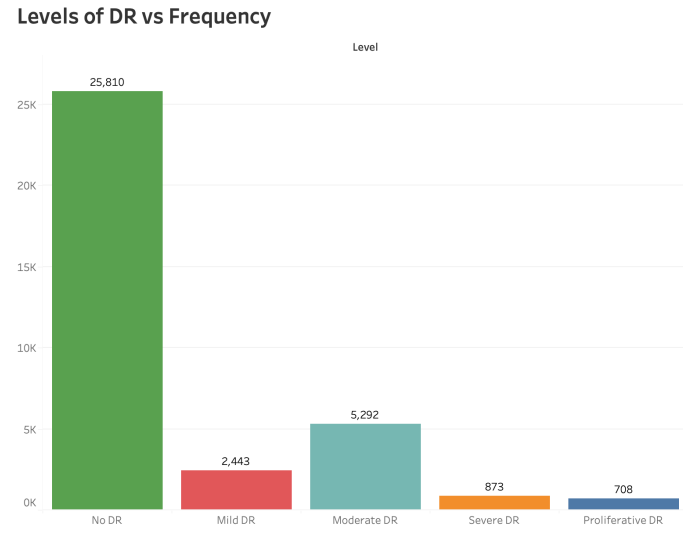The dataset consist of 35,126 set of images. The classes have an uneven distribution of images.

Figure 2: Sum of number of records for each level

IV. Requirements

V. Analysis

6. Design

7. Implementation

8. Conclusion

Bibliography and References

"Diabetic Retinopathy - Stages." 2017. https://www.nhs.uk/conditions/diabetic-retinopathy/stages/.

"Diabetic Retinopathy Detection." n.d. https://kaggle.com/competitions/diabetic-retinopathy-detection.

"Diabetic Retinopathy Vs Normal." n.d. https://www.advancedretinaassociates.com/patient-education/diabetic-retinopathy/.