

# Blindness Detection

## Group Members

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In this day and age; blindness is very common among young people. In 2007, the survey by CNIB Foundation estimated that more than 1.5 million people in Canada suffer from vision loss. The leading cause of vision loss in Canada is Cataracts which is followed by age related degeneration. Usually vision loss happens overtime while other times it decreases gradually. In order to catch it earlier rather than later; Machine Learning concepts can be applied. The state of the art approach varies on exactly what a user is trying to achieve. Usually, a simpler algorithm is the most effective one but our group will look into different types of algorithms. We will start off by investigating “Nearest Neighbour Algorithm” followed by other techniques we will learn in the class. We will also look into Deep Learning which will help us gain understanding of the data sets and will help us minimize and eliminate the noise data points that might affect the performance of the machine. The other interesting algorithm that we came across is “Random Forest Algorithm”. Random Forest Algorithm is based on decision trees that are collective in nature. This means that they classify according to the characteristics of the data (eg. shades, length etc). The data is taken as random and can continue to increase its performance as the classification grows. This will help us explore and model the machine learning algorithm in such a way; where we can analyze efficiency, performance and accuracy with our testing set.

The sample and test data comes from Kaagle (APTOS 2019) where they organized a competition to build a machine learning model to speed up disease detection. We will work with thousands of images collected in rural areas to help identify diabetic retinopathy automatically. A large set of retina images taken using fungus photography under a variety of imaging conditions.

A clinician has rated each image for the severity of diabetic retinography on a scale of 1 to 5:

1. No DR
2. Mild
3. Moderate
4. Severe
5. Proliferative DR

In conclusion; we also can combine two different algorithms in respect to efficiency, accuracy and precision without the hindrance of noise data points. Keeping in mind the fact that we have

to deal with space and time complexity; we will test the combined models together. The research is still in the continuous phase as we are exploring and understanding different types of algorithms that other resources have to offer.

### **RACI Chart**

R= Responsible, A = Accountable, C= Consulted , I = Informed

Member Name	Ramanpreet Singh	Amandip Padda (PM)	Ihab Mohamad
Documentation	R	A	I
Version Control	R	A	I
Data Collection	I	R	R
Python Development	A	R	A
Marketing	I	I	R
Risk Assessment	A	R	R
Prototypes	R	A	A
Testing	I	I	A,R

\* PM = Project Manager

### **References**

Paul Mueller, John. (2021). Machine Learning for Dummies (2nd ed). Willey.

Batta, Mahesh. (2020). Machine Learning Algorithms - A Review. International Journal of Science and Research (IJSR).