

DIABETIC RETINOPATHY DETECTION

(Group 8)

DATASET --

The dataset consists of a large set of high-resolution retina images taken under a variety of imaging conditions. A left and right field is provided for every subject.

Our task is to create an automated analysis system capable of diagnosing the disease based on these images.

The images in the dataset come from different models and types of cameras, which can affect the visual appearance of left vs. right. Some images are shown as one would see the retina anatomically (macula on the left, optic nerve on the right for the right eye). Others are shown as one would see through a microscope condensing lens (i.e. inverted, as one sees in a typical live eye exam). There are generally two ways to tell if an image is inverted:

- It is inverted if the macula (the small dark central area) is slightly higher than the midline through the optic nerve. If the macula is lower than the midline of the optic nerve, it's not inverted.
- If there is a notch on the side of the image (square, triangle, or circle) then it's not inverted. If there is no notch, it's inverted.

Images may contain artifacts, be out of focus, underexposed, or overexposed. A major aim of this project is to develop robust algorithms that can function in the presence of noise and variation and to reduce the amount of false negatives.

PLANNING --

We intend to use Support Vector Machines with a Gaussian Kernel in order to efficiently diagnose the disease with maximum achievable accuracy. Also, since the dataset is skewed, it is necessary to use evaluation metrics like precision, recall and f-score.