

Computerized System for Macula Localization & Detection in Human Retinal Image using Image Processing

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Dedication

As our loving parents have supported us throughout the project so, we would like to dedicate this project to them. They have given us motivation to tackle every task with passion and determination. Without their support, we would not be standing at this stage where we have successfully completed our project.

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First, we would like to thank Allah almighty (SWT) for His countless and endless blessings. Without his elegance, it would be impossible for us to complete the project. Secondly, we would like to thank our supervisor who have always been with us in every difficulty we face during the project, helped us a lot to understand the image processing techniques and have always appreciated us on our effort. His belief in us made us to aim high and to push ourselves beyond our limits during the project and in our lives.

Abstract

Macula Localization & Detection System can automatically detect the Macula in human retinal images or in other words in fundus images. The ophthalmologist uses a Fundus Camera to take the images of patient's eyes and then these images are stored on a computer system, after that our Macula Detection & Localization System is used to select those images to detect Macula in real time. It is really difficult and time consuming for the ophthalmologist to do manual screening and to look for further anomalies in the patient's eye because there is not only a Macula present in a human retinal image but there are several other things like Optical Disk, Vessels and Bright/Dark Lesions. Lesions are abnormalities caused by diseases and are present on or around any type of tissues in the retina.

The basic purpose to make this system is saving ophthalmologist's time and cost. There is no need for him/her to take a lot of time just to look manually at patient's one eye then the other. In few cases, it is almost impossible to locate it manually because of any disease or blood clotting over the region of Macula in human eye. Thus, Macula Detection & Localization System can automatically localization it in no time and can mark its location on the image such that to make it easy for the ophthalmologist to see where it actually lies. Our system also holds the record of all images once processed in the system so to further increase the speed.

The system has five main steps, selecting an image (taken by a Fundus Camera) then apply some filters to clear objects present in the image (one of them can be macula) after that extract features of each object (objects are called blobs in image processing) and then match these features with the extracted features of macula from some sample images. Finally, saves the resulted image with a mark on macula location.

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