VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 010

PROJECT REPORT ON

"DETECTION OF EXUDATES IN RETINAL IMAGE"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING

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2016-2017

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CERTIFICATE

Certified that the project work entitled "**DETECTION OF EXUDATES IN RETINAL IMAGE**" *is a bona fide work carried out by*

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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2016–2017. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.

17/5/17.	D.V.M 17/5/17	
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ABSTRACT

There are many people who are suffering from blindness because of diabetic retinopathy. Globally, an estimation shows about 40 to 45 million people are totally blind, 135 million have low vision and 314 million have some kind of visual impairment. The incidence and demographics of blindness vary greatly in different parts of the world. In most industrialized countries, approximately 0.4% of the population is blind while in developing countries it rises to 1%. It is estimated by the World Health Organization (WHO) that 87% of the world's blind live in developing countries.

Diabetes is known as the mother of all diseases and it directly affects the retina which is a main part of the eye so it is called as diabetic retinopathy. Diabetic retinopathy is a vision threatening complications, about 25 thousand people are blind in US due to diabetic retinopathy. It is estimated that diabetic retinopathy is responsible for 5% of all world's blindness cases. Early diagnosis of diabetic retinopathy and providing proper treatment can prevent blindness. The main sign of diabetic retinopathy are exudates. If exudates are detected, then diabetic retinopathy can be detected at an early stage.

This project describes about the median filter algorithm. At first, color fundus image is taken as input. Then image is converted to grayscale by thresholding. In the thresholded image, mean filter of 30x30 mask size is applied. After masking, upper bound of the image is calculated by adding constant to the filtered image and lower bound can be calculated by subtracting another constant from the smoothened image and have assumed the constant as 40 and 45. Any pixel outside this limit would be considered as unwanted data such as fovea, blood vessels, and dark lesions. The pixels that have intensities higher than the upper bound or lower than the lower bound are defined as unwanted data. For the detection of exudates, the background is subtracted from the gray scale image to obtain the foreground of image. Now in the foreground image only exudates and optic disks are remain. Then optic disk is removed by erosion and dilation. Finally, exudates are detected.