

# V. E. S. Institute of Technology, Chembur, Mumbai

## VESIT-Aditya Jyot Eye Innovation Centre Project

Academic Year: 2020-2021

**Project Collaboration:** Aditya Jyot Eye Innovation Centre (Aditya Jyot Foundation for Twinkling Little eyes)

VESIT-Aditya Jyot Eye Innovation Centre is the result of a collaborative relationship between two diverse fields namely medicine and engineering, for the purpose of medical research and technological innovation. In VESIT-Aditya Jyot Eye Innovation Centre, a platform is provided for development of student-based research projects on various fields of ophthalmology, to provide better and superior health care facilities which are technology driven, for the poor and needy.

**Project Title:** Detection of Diabetic Retinopathy using fundus images

**Name of the Faculty:** Mrs. Sangeetha Prasanna Ram, Mrs. Amudha Senthilkumar

**Name of the Students:** Advait Shirvaikar, Tanmay Shrivage, Anjali Kothawade, Advait Mandlik

### **Description of the Project:**

Diabetes Mellitus is a condition in which a human body is unable to produce enough insulin to regulate metabolism of sugar for storage in human cells. This results in high sugar levels in blood that may progressively damage the blood vessels in the retina and can result in vision impairment leading to diabetic Retinopathy. The primary objective of this project was to find out the most accurate transfer learning algorithm that would identify the severity of the diabetic retinopathy and classify diabetic retinopathy and non-diabetic retinopathy images accurately. The detection of Diabetic Retinopathy depends upon identification of minute features like exudates or microaneurysms. The dataset consists of images that are captured under varying environments and at different locations. Thus, the images are not standardized. One of the most important things to look out for, when deploying a Machine Learning model is that the data is standardized, to get the best possible result. The system proposed in this project has two modules: 1. Image Processing - to facilitate standardization of all the images 2. Machine Learning Classification Module - to classify the images as our perusal Input to the models was real-time augmented images, processed as 'Intensity Equalization of the RGB images and application of CLAHE on the luminous channel of the images' and 'Grayscale and local mean subtraction'. The RGB images gave a better result during the first training, so all the Input to the models was real-time augmented images, processed as 'Intensity Equalization of the RGB images and application of CLAHE on the luminous channel of the images' and 'Grayscale and local mean subtraction'. The RGB images gave a better result during the first training, so all the subsequent models were trained on RGB images.

  
(Mrs. Sangeetha Prasanna Ram)