IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 3, March 2018

Diabetic Retinopathy Identification using Object Detection Method

Prof. Gauri R. Rao[1], Alankrita Srivastava[2], Pooja R. Patil[3], Dhruv Datta[4]

Associate Professor, Department of Computer Engineering, Bharati Vidyapeeth University College of Engineering, Pune, Maharashtra, India[1]

Student, Department of Computer Engineering, Bharati Vidyapeeth University College of Engineering, Pune, India[2,3,4]

Abstract: Diabetic retinopathy, also known as diabetic disease for eye. In this disease, damages occur to retina of patient. 90% of the cases can be reduced by large number by identifying and providing proper treatment patient's. So, there is need of such approach in which diabetic retinopathy identification can be done easily. So, proposed approach uses python and different object detection techniques to determine if the provided image is affected by diabetic eye disease or not.

Keywords: Diabetes, Diabetic retinopathy, Object Detection, Retinopathy, Eye Disease.

I. INTRODUCTION

The diabetic retinopathy is increasing as compared to past few decades. It affects the 80% of population who had diabetes for more than 20 years. As longer a person has diabetes, there are huge number of chances of getting diabetic retinopathy.
This leading diabetic retinopathy starts damaging the retina. This retinal damage results into the blindness, which may lead to permanent retina damage. Also, the problem is that, diabetic retinopathy does not have early warnings or signs. In general, persons vision starts getting blur, making them the things hard such as read or drive. In some cases, their situation may get worse or better.

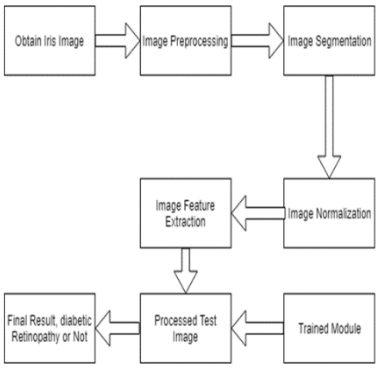
So, there is need to find a solution that will help to detect diabetic retinopathy condition of patient.

[2] describes that, the patients with diabetes are at risk of diabetes retinopathy therefore, they should get their eyes checked up at a regular interval for the diagnosis of diabetic retinopathy. Since Proliferative diabetic retinopathy does not show any symptoms until they are in last stage of vision loss.

[3] When a large amount of glucose or fructose gathers in blood, the vessels start crumbling due to insufficient distribution of oxygen to cells. Any blockage in these vessels leads to a severe eye injury. Due to the blockage in the vessel, the metabolic rate slows down and leads to structural abnormality in vessels which intern DR.

II. SYSTEM ARCHITECTURE

System architecture is as follows :



- System architecture consists of :
- Obtaining Iris image:
  Get the iris image of patient.

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 3, March 2018

- Image Preprocessing:
  While iris image is obtained from patient, it is possible it may contain different noise content.

  To detect clearly, it is necessary to remove noise content from the image, so different techniques can be used such as,

- Gaussian Noise Removal
- Salt and Pepper Noise Removal

- Image segmentation:
  Image segmentation is the simplest and the most sorted technique for extracting information from an image.

  This is generally considered as the first step in image analysis.

  The Segmentation process subdivides an image into its constituent parts or objects, such that level of subdivision depends on the problem to be solved.

  Segmentation is stopped when the Region of interest in a specific application has been isolated.

  Generally, one of the most difficult tasks in digital image processing is the autonomous segmentation method.

- Feature Extraction:
- From image, different features are extracted that can be used for identifying diabetic retinopathy.
- Provide test image to trained module:
- In this, the test image is provided to trained module to identify the region where retina is damaged due to diabetic
  retinopathy.
- Final Result:

Final result consists of only two values,
1. Diabetic retinopathy test successful,
2. Diabetic retinopathy test failed.

III. METHODOLOGY

This process of identification of diabetic retinopathy consists of many steps, some of them are,

- Training:
- Obtain dataset of iris images
  In this step, dataset that having different types of iris images which are diabetic retinopathy positive.
- Image Preprocessing:
- Noise Removal:
- Gaussian Noise Removal:
  In python, image processing provides a function to remove Gaussian noise
- Salt and pepper noise:
  By applying different filters, salt and pepper noise from the image is removed.
- Image Segmentation:
  In this step, sure foreground and sure background are identified, so that image can be segmented.
- Module Training:
  By performing image preprocessing, the dataset module is trained on dataset. This will help to find the region which is infected and which is not.
- Testing:
- Obtain iris image:
  In this step, iris image from patient is obtained to test it for diabetic retinopathy.
- Image preprocessing:
  As mentioned above, image preprocessing is also performed on test image.
- Applying trained module:
  From trained module for diabetic retinopathy, the test image is tested against it. It will show, if image contains the region that is infected or not.

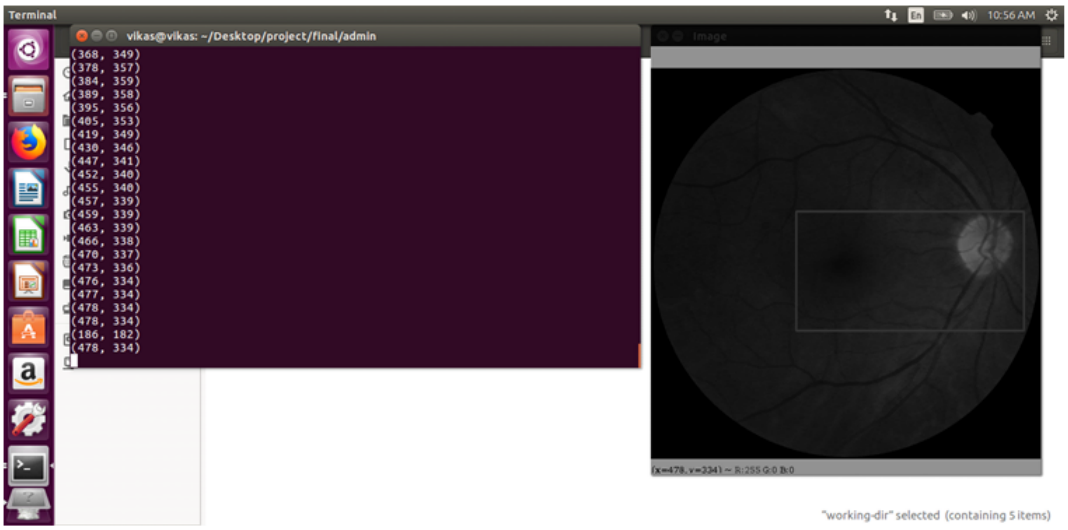
IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

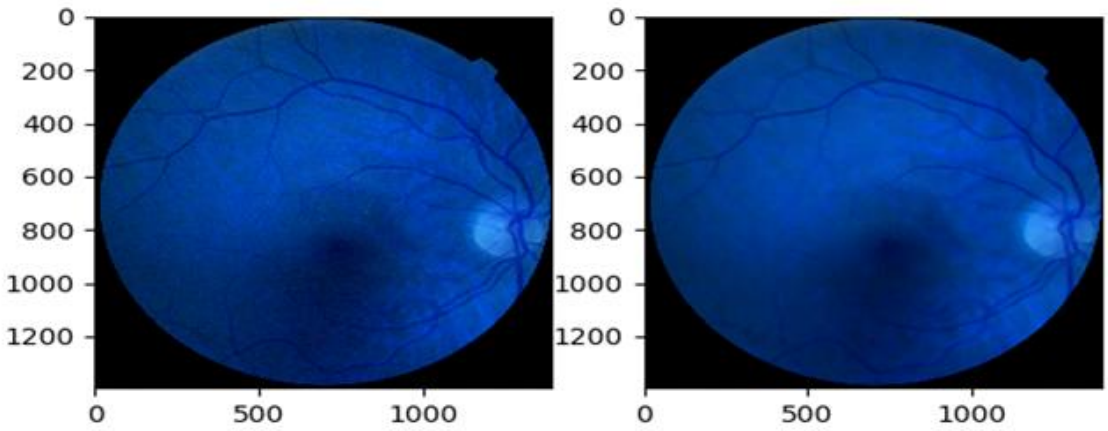
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 3, March 2018

IV. RESULT AND ANALYSIS

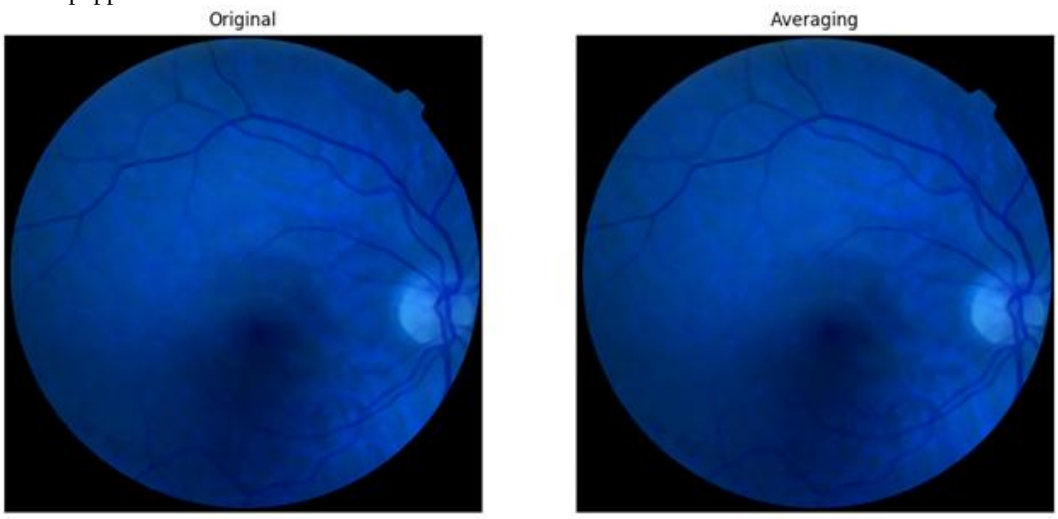
- Train Module



- Gaussian Noise Removed



- Salt and pepper noise removed

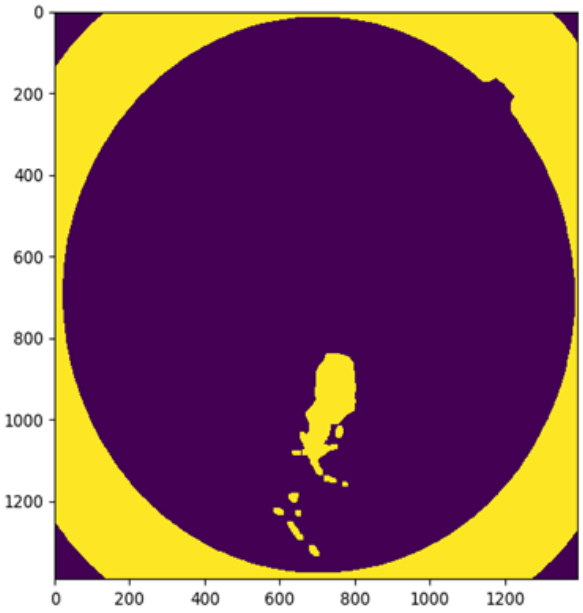


IJARCCE

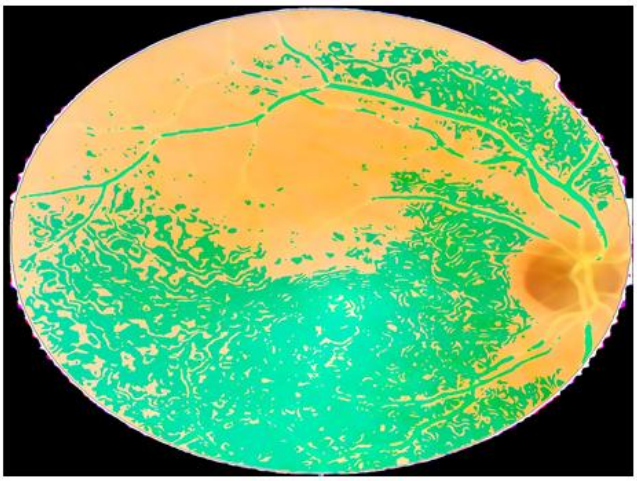
ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 3, March 2018

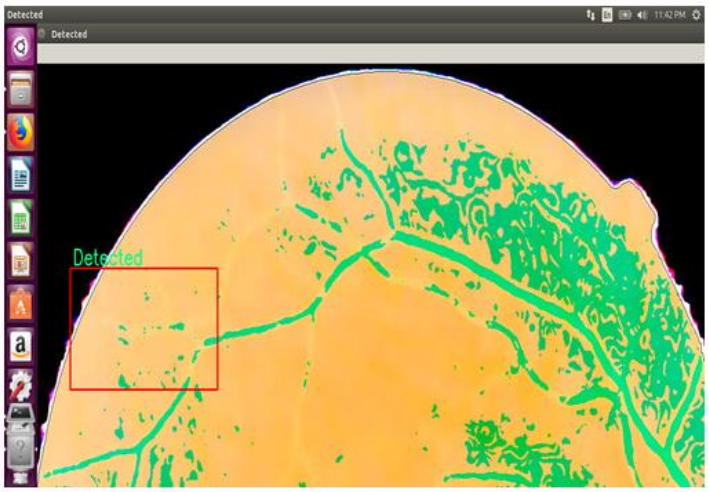
- Unknown region found



- Test image after preprocessing



- Detected
- Not detected



ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 7, Issue 3, March 2018

V. FUTURE SCOPE AND CONCLUSION

Diabetic retinopathy detection system can be used to identify the patients retinal damage and it will help to different eye specialists to treat patient accordingly. It will reduce time required for manual testing, which will be more efficient and less time consuming. In short, it will enhance operational speed. In future, by obtaining large dataset, module can be trained for getting more accurate results. This will help users to get accurate results. Also, we can find, how much retinal damage is in test image and according to that, system should suggest treatment.

REFERENCES

[1]. Anupriyaa Mukherjee, Diksha Rathore, Supriya Shree, Asst Prof. Shaik Jameel, “Diagnosis of Diabetic Retinopathy”, http://www.ijera.com, Vol. 5, Issue 2, February 2015, pp.21-24
[2]. Javeria Amin, Muhammad Sharif, and Mussarat Yasmin, “A Review on Recent Developments for Detection of Diabetic Retinopathy,” Hindawi Publishing Corporation Scientifica Volume 2016, Article ID 6838976
[3]. Detection of diabetic presence from iris by using support vector machine "International journal of Engineering Sciences & Research Technology Prof. N.D. Pergad* , Miss. S. B. More
[4]. “Diabetic Retinopathy Detection using Image Processing: A Survey " Muhammad Waseem Khan International Journal Of Emerging Technology & Research
[5]. "Using image processing methods for diagnosis diabetic retinopathy" Ali ShojaeipourI, Md.Jan Nordin2, Nooshin HadavP 2014 IEEE International Symposium on Robotics and Manufacturing Automation
[6]. "Diabetic Retinopathy Detection using Image Processing: A Survey" Anupama Pattanashetty, Dr. Suvarna Nandyal IJCSN International Journal of Computer Science and Network, Volume 5, Issue 4, August 20