Welcome To All

14-Dec-15

Introduction About Myself

- Saraswathi
- Completed M.Sc., M.Phil., M.C.A
- Doing PhD[II Year] in Bharathiar University-Part Time
- Assistant Professor in Nehru Memorial College

Thanks

- My Hearty Thanks To OMICS International to Conduct the 7th Indo Global Diabetes International Conference inside India.
- My Deepest Thanks to all the Members belonging to the Organizing Committee.
- My Sincere Thanks to all the Members belonging to this Conference.
- My Genuine Thanks to the 7th Indo Global Diabetes for giving me the opportunity to present the paper here.

Introduction About My Research

- Retrieval of Retinas in fast from the database which are affected by Nonproliferative Diabetic Retinopathy Using Feature Extraction Methods.
- Diagnosis of Different Stages of Diabetic Retinopathy is one of the parts in my research.
- Before Retinas Retrieval , Different Stages are diagnosed using some Methodologies with MATLAB

Methodologies Available For

Diagnosis Different Stages of Non-Proliferative Diabetic Retinopathy

Diabetic Retinopathy

- One of the Diabetic eye diseases.
- Group of eye conditions that affect people who have diabetes.
- Which causes progressive damage to the tiny blood vessels in the retina.
- Retina- The light sensitive lining at the back of the eye.
- Falls into two different classes: Nonproliferative and Proliferative.

Nonproliferative Diabetic Retinopathy

NPDR

- Also called as “Pre-Proliferative”.
- The early state of the disease in which symptoms will be mild or non-existent.
- Progress through three stages.
  1. Mild NPDR 2. Moderate NPDR
  3. Severe NPDR
- Different stages of NPDR are identified through Signs and Symptoms on the surface of the retina layers.

Signs and Symptoms of NPDR

- Microaneurysms- appear as small blood clots on the surface of the retina layers.
- Exudates- appear as bright lesions in the retina and have sharp edges and high contrast with the background
- Hemorrhages-appear as Bigger blood clots on the surface of the retina.

Diagnosis of Different Stages of NPDR

- Mild- Indicated by the presence of at least 1 Microaneurysm on the surface of the retina layers.
- Moderate- Indicated by the presence of Hard Exudates on the surface of the retina layers.
- Severe-Indicated by the presence of Microaneurysms and Hemorrhages on the surface of the retina layers.

Diagnosis of Mild Stage of NPDR

Steps to Diagnose Mild Stage

1. Read the Fundus Image.
2. Convert it into a Green Channel Image.
3. Adaptive histogram equalization technique is adopted to perform the Contrast enhancement.
4. Morphological filling is also performed on the green channel image.
5. The unfilled green channel image is subtracted from the filled one.

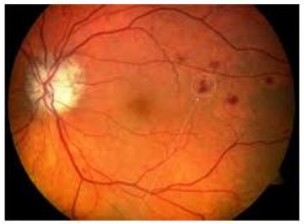
Diagnosis of Mild Stage of NPDR

Steps to Diagnose Mild Stage

6. The Previous output image Threshold in intensity to yield an image (R) with Microaneurysms patches.
7. Converts the true color image RGB to a binary image.
8. Changed the Foreground and Background Pixel Colors.

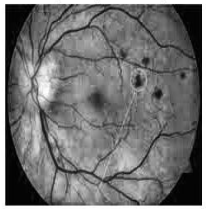
Figures of Mild Stage of NPDR

Original Image

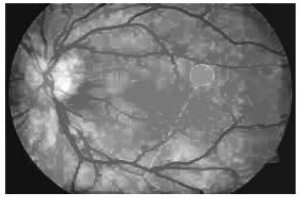


Green Channel Image

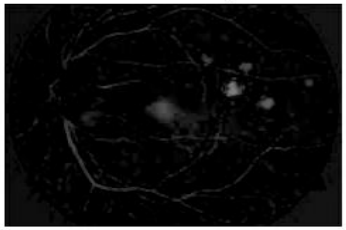
Histogram Equalization Image



Morphological Filling

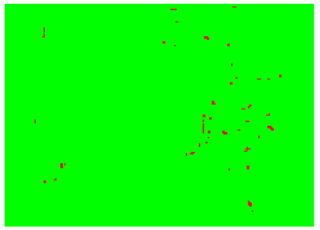


Subtraction Image



Binary Image

Microaneurysm Image



Diagnosis of Moderate Stage of NPDR

Steps to Diagnose Moderate Stage

1. Read the Fundus Image.
2. Convert Image from RGB Color Space to L*a*b* Color Space.
3. Use kmeans to cluster the objects into three clusters.
4. Repeat the clustering three times.

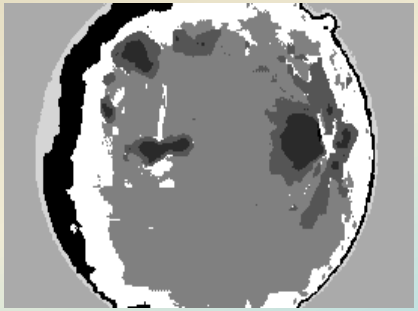
Diagnosis of Moderate Stage of NPDR

Steps to Diagnose Moderate Stage

5. Label every pixel in the image with its cluster index.
6. View Different Clusters and Got the correct result from those Clusters.

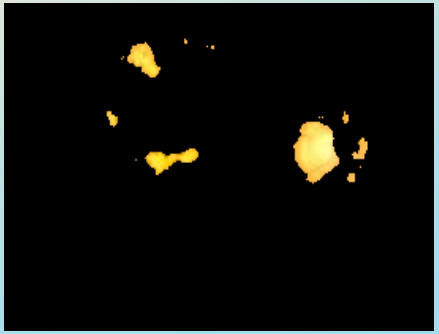
Figures of Moderate Stage of NPDR

image labeled by cluster index



objects in cluster 1

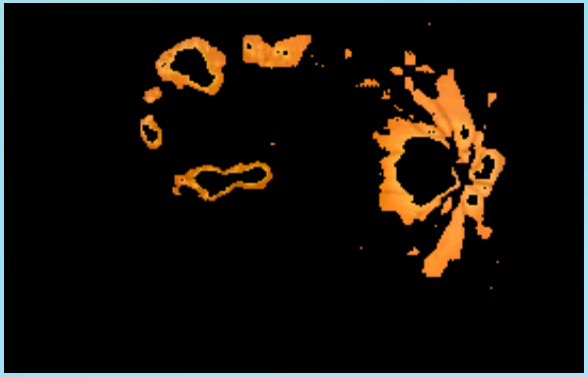
objects in cluster 2



objects in cluster 3

objects in cluster 4

objects in cluster 5



Diagnosis of Severe Stage of NPDR

Steps to Diagnose Moderate Stage

1. Read the Fundus Image.
2. Convert it into a Green Channel Image.
3. Morphological filling is performed on the green channel image.
4. The unfilled green channel image is then subtracted from the filled one.

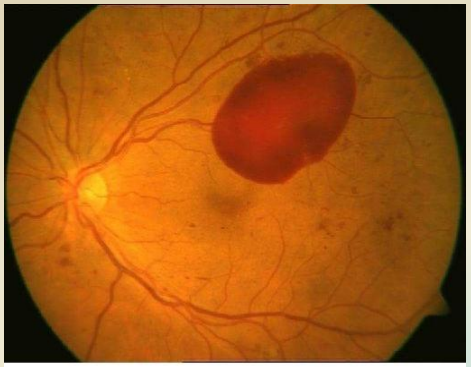
Diagnosis of Severe Stage of NPDR

Steps to Diagnose Mild Stage

6. The output image Threshold in intensity to yield an image (R) with Microaneurysms patches.
7. Converts the true color image RGB to a binary image.
8. Changed the Foreground and Background Pixel Colors.

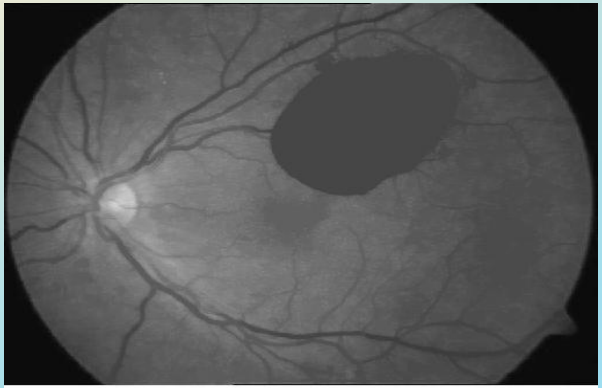
Figures of Severe Stage of NPDR

original image

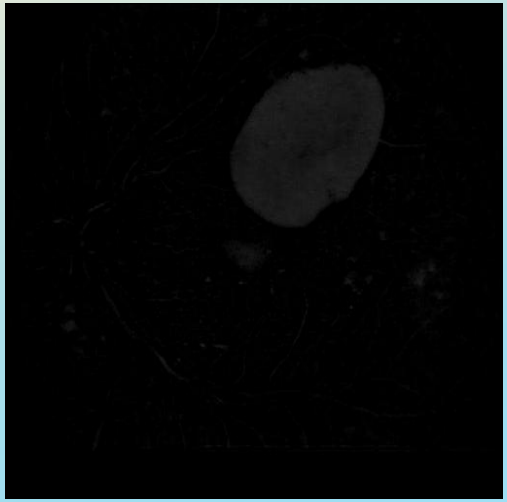


Green Channel Image

Morphological Filling

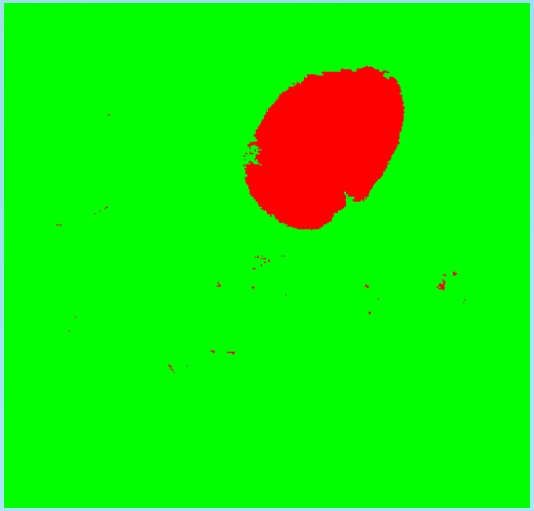


Subtract Image



Binary Image

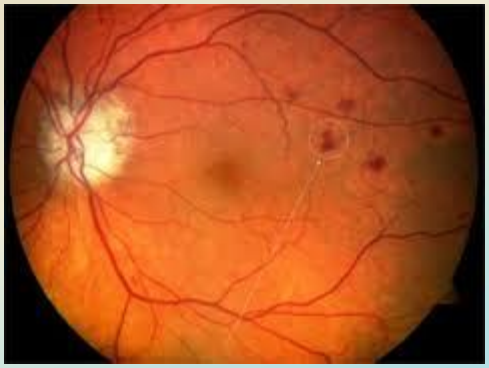
Hemorrhages and Microaneurysm Image



Figures of Different Stages of Retinas

Normal Stage Retina

Mild Stage Image

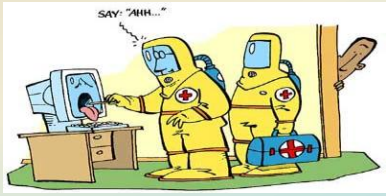


Moderate Stage image

Severe Stage image

Proliferative Stage image

Journal References



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Conclusion

- An early detection and diagnosis of NPDR will aid in prompt treatment and a reduction in the percentage of vision lost for all diabetic patients.

Future Work

- To find out the software with some speed to detect the different stages of NPDR to present the safe vision to all diabetic patients.


Thank
You