



DIABETIC RETINOPATHY DETECTION USING CNN

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ABSTRACT

Diabetic retinopathy (DR) is a significant microvascular complexity coming about because of diabetes and keeps on seriously affecting worldwide wellbeing frameworks. The rising circumstance in the creating scene proposes diabetic retinopathy may before long be a significant issue in the clinical world for detection of DR. Diabetic retinopathy or DR is an ailment because of diabetes mellitus that can harm the patient image retina and also cause blood spills. This general condition can also make various indications from gentle vision issues total visual impairment in the event that it isn't convenient treated. A PC supported determination strategy dependent on profound learning calculations is proposed to automated analyze the referable diabetic retinopathy (RDR) by characterizing shading retinal fundus photos into two evaluations. In this paper, we proposed a calculation that comprises of DR location strategy in combination with convolutional neural network(CNN) with the main aim to improve the precision of the current frameworks. There has been a requirement for extensive and mechanized DR location instruments and techniques. The primary objective is to naturally group the evaluation of non-proliferative diagnosis of diabetic retinopathy at any common retinal image.

Keywords: Retinopathy, Convolutional Neural Network, Diabetic.

INTRODUCTION

Diabetic Retinopathy is the most debilitating form of diabetes in which serious damage occurs to the retina and causes visual impairments. There are four stages of DR that is Mild DR, Moderate DR, Severe DR, Proliferative DR. Different software analysis frameworks have been created in the course

of the most recent decade. CNN calculation gives advantage over others by perceiving designs under outrageous inconstancy. Diabetic Retinopathy (DR) is the analysis based retinal wound, which brought about by the rise of glucose levels in blood, this can be at last maliciously lead to vision impedance or permanent loss of sight. As it



has been indicated by the standards of World Health Organization, it has been scientifically evaluated that over 75% of individuals who have diabetes for over 20 years will definitely have some type of DR

in the life stages. Despite these intimidating statistics, research indicates that at least 90% of these new cases could be reduced if there were proper and vigilant treatment and monitoring of the eyes.

LITERATURE RIVEW

| S. No | Journal Type with year | Authors | Title | Outcomes |
|-------|------------------------|--|---|---|
| 1 | MDPI, 2017 | Kele Xu, Dawei Feng, and Haibo Mi | Deep Convolutional Neural Network-Based Early Automated Detection of Diabetic Retinopathy Using Fundus Image | Deep convolutional neural network methodology for the automatic classification of diabetic retinopathy using colour fundus image, and obtained good accuracy on our dataset |
| 2 | AMIA, 2018 | Lam C, Yi D, Guo M, Lindsey T | Automated Detection of Diabetic Retinopathy using Deep Learning | Convolutional neural networks (CNNs) on colour fundus images for the recognition task of diabetic retinopathy staging. |
| 3 | JAMA, 2016 | Varun Gulshan, Subhashini Venugopalan, Rajiv Raman | Development and Validation of a Deep Learning Algorithm for Detection of Diabetic Retinopathy in Retinal Fundus Photographs | The algorithm was evaluated at 2 operating points selected from the development set, one selected for high specificity and another for high sensitivity. |



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|---|--------------|--|--|---|
| 4 | ISSPIT, 2019 | Sara Hosseinzadeh Kassani, Peyman Hosseinzadeh Kassani, Reza Khazaeinezhad, Michal J. Wesolowski et al | Diabetic Retinopathy Classification Using a Modified Xception Architecture | In this paper, we present a new feature extraction method using a modified Xception architecture for the diagnosis of DR disease. |
|---|--------------|--|--|---|

EXISTING METHOD

The Fuzzy C-Means Clustering method directly uses the color and domain knowledge is used. The Histogram is generated for the normalized color intensities. This Histogram increases the semantic gap between Normal Region and Abnormal Region. Histogram Ratio and Back-

Propagation Extracts the Feature Sets and complete region is extracted by mapping the Density Quantiles. Finally, The Fuzzy C Means Algorithm is employed to detect the actual Diabetic Retinopathy.

DISADVANTAGES

1. It cannot handle noisy data and outliers.
2. It is not suitable to identify clusters with non-convex shapes.

PROPOSED METHOD

In proposed method we are performing the classification of either the diabetic

retinopathy identification using Convolution Neural Network (CNN) of deep learning along with the machine learning methods. As image analysis-based approaches for diabetic retinopathy detection. Hence, proper classification is important for the proper retinopathy that which will be possible by using our proposed method. Convolutional layer utilizes the convolutional includes and processes the item between the image patches and the channel. For the initiation layer ReLU can be utilized. ReLU layer play out an edge activity to every component of the information where any worth under zero is set to zero.

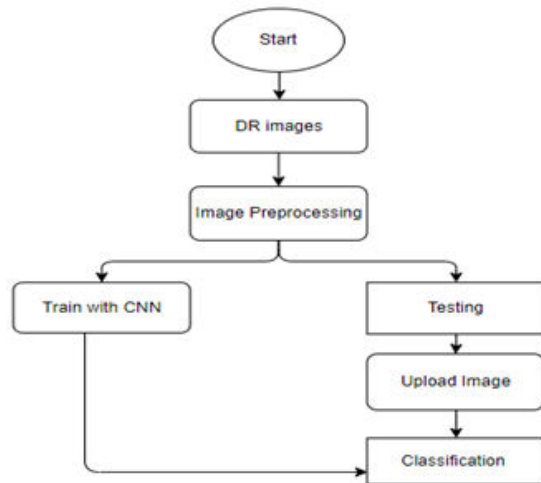


Fig.1: Block diagram of proposed method

METHODS OR TECHNIQUES USED

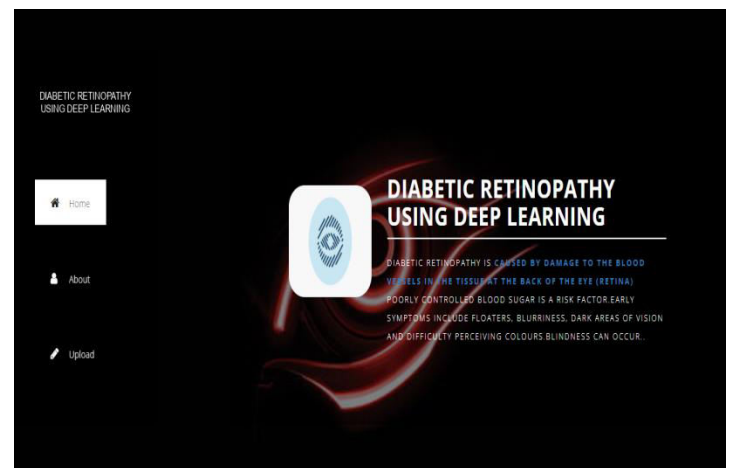
Convolutional Neural Network:

In deep learning, a convolutional neural network (CNN, or ConvNet) is a class of deep neural networks, most commonly applied to analysing visual imagery. A convolutional neural network consists of an input layer, hidden layers and an output layer. In any feed-forward neural network, any middle layers are called hidden because their inputs and outputs are masked by the activation function and final convolution. In a convolutional neural network, the hidden layers include layers that perform convolutions. Typically, this includes a layer that does multiplication or other dot product, and its activation function is commonly RELU. This is

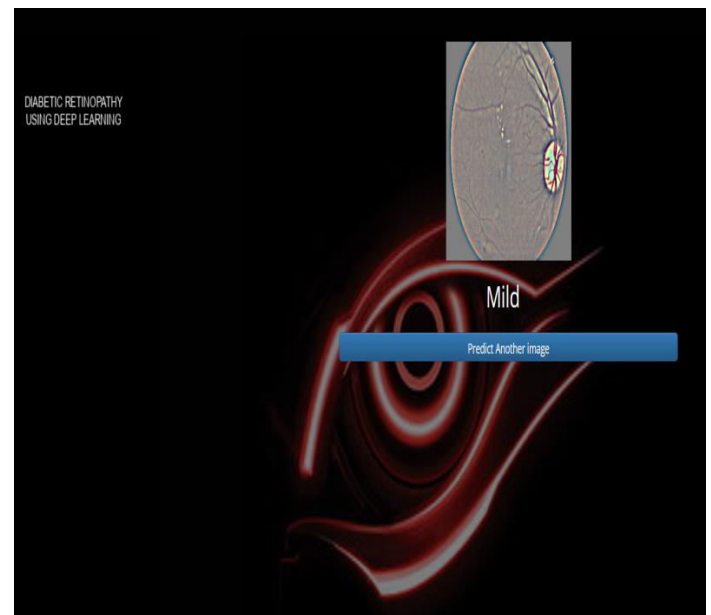
followed by other convolution layers such as pooling layers, fully connected layers and normalization layers.

RESULT

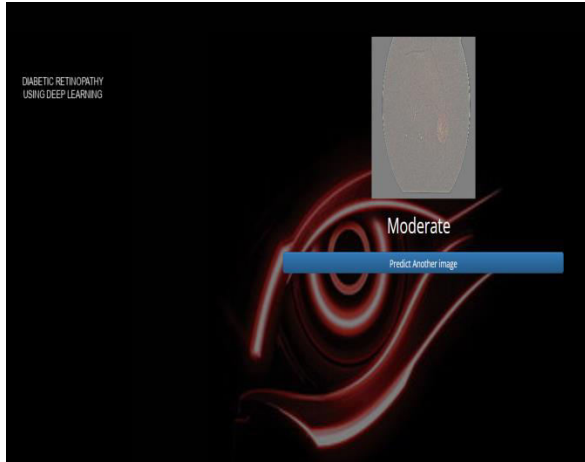
HOME PAGE: This is the home page of the Diabetic Retinopathy.



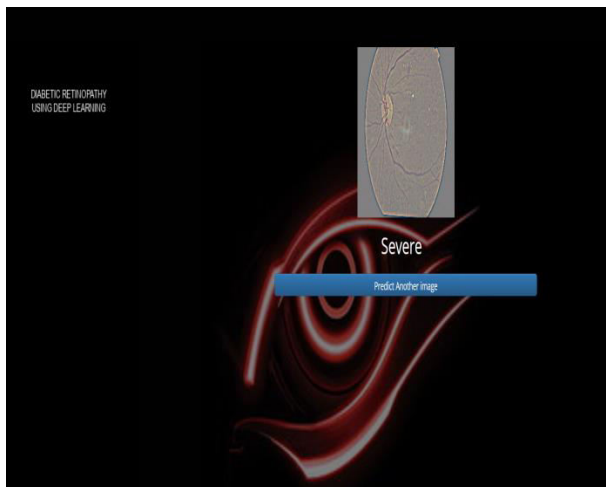
ClassifyOutput1:



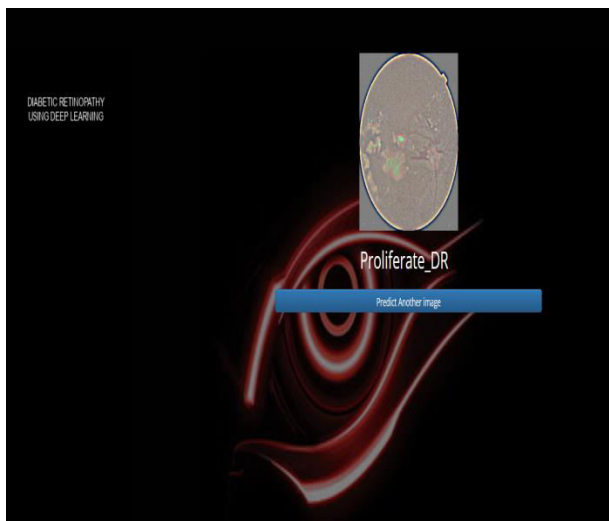
Classify Output2:



Classify Output3:



Classify Output4:



ADVANTAGES

1. Accurate classification
2. Less complexity
3. High performance
4. Easy identification

APPLICATIONS

1. Diagnostic process especially for infected patients.
2. Used in Laboratories.
3. Mainly used in analysing visual imagery.

HARDWARE&SOFTWARE

REQUIREMENTS

H/W Configuration:

1. Processor - I3/Intel Processor
2. Hard Disk -160GB
3. RAM -8Gb

S/W Configuration:

Operating System:

- | | |
|----------------------|-------------------------------|
| 1. Windows | :7/8/10 |
| 2. Server-sideScript | : HTML, CSS & JS |
| 3. IDE | :PyCharm |
| 4. Libraries Used | : Numpy, IO, OS, Flask, Keras |
| 5. Technology | : Python 3.6+ |

CONCLUSION

In this project we have successfully classified the images of Identification of



diabetic retinopathy, using the deep learning and machine learning. Here, we have considered the dataset of diabetic retinopathy images which will be of different types (Mild, Moderate, Severe and Proliferate) and trained using CNN. After the training we have tested by uploading the image and classified it.

FUTURE SCOPE

This can be utilized in future to classify the types of different Deficiencies easily that which can tend to easy to Predicated the retinopathy for diabetic in early stages and can take the initial curing of human and take measures to not affect.

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