IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 6, June 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.165

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 10, Issue 6, June 2022 ||

| DOI: 10.15680/IJIRCCE.2022.1006166|

Detection of Diabetic Eye Disease Using Deep Learning techniques, CNN

Vignesh V [*1], K Sharath [*2]

Dept. of MCA, Bangalore Institute of Technology, Bengaluru, India. [*1]

Dept. of MCA, Assistant Professor, Bangalore Institute of Technology, Bengaluru, India. [*2]

ABSTRACT: Diabetes is one of the most prevelant continual disease and as a result Diabetic Retinopathy (DR) is a growing within the population, this causes blindness from partial to full blindness if left untreated. The screening for this diabetic retinopathy(DR) is expensive most of the time, negligence due to the cost leads to cause more distruption the fact is that 57% of people in India doesn't even know they have diabetics. To deal with this we propose a CNN structure to diagnose with retinal fundus images. Deep learning is a powerful algorithm which learns by itself with a set of examples to do a desired job . Long short term memory (lSTM) is used in deep learning to learn long term memory cell. This paper is an experiment on building models which could give more accuracy on detection of the disease and it severity and making it available in the medical field so that people to make the most of it.

I. INTRODUCTION

The term Diabetic retinopathy is the prime purpose of which is not reversible and seen through naked eyes and it is the blindness throughout the world. The cause of DR is from a lot of blood glucose ranges which results in capillary damage. Specially DR creates a impact on the population who are working and has more of incidence fee through out the world. There are many reason and is very important why to find out DR in initial stages. This disease is very complicated to identify in the initial stage, because they are not visible externally. They do not show any signs at the starting stage so , it is very tough to find out the DR present in a particular person, if left uncheck it can give rise to getting blind. So early check-ups and simple screening can reduce the visible loss to 57.0% also adding the treatment fee. This is clinically graded through retinal fundus or through the imaging strategies with the pictures of fundus or optical coherence tomography. The detection of DR grading structures and treatment of can be reduced by retinal fundus so that the widespread of DR can be reduced and can check on all seven retinal fundus fields. As known ETDRS is spread globally , the cause of it because of implementation, the amount of complexity and all the technical limitations present. Along with International Clinical Diabetic Retinopathy the opportunity structures are also taken into use, because it quietly known in medical and Computer-aided Diagnosis will be able to make bigger settings.
The basic level of DR comes under the way of small regions getting swelling inside the blood vessel of retina called the micro-organisms. There will be shortage of bleeding inside the retinal nerves and if you detect this DR at the right time specific treatment can be given at the earliest. If it is not taken care at the early stages itmay move to mild stages. At this mild level hard exudates will also exist. After this stage comes the severe NPDR at this level very large number of blood vessels which are present inside the retina are restricted affection over 20 intraretinal hemorrhages, there are many intraretinal microvascular abnormailities we can see through as bulges of skinny vessels. PDR is very serious disorder and may happen when it is not identifies in early stages and left unchecked for a loner period of time. In this disorder the new blood vessels will get inside the retina and this disorder is named as noevasculrization (NV). The blood vessels in this are very sensitive which has high chances of fluid leaking. In this level many issues will arise like blurriness, decreased vision or a person can get totally blind.

II. PROBLEM STATEMENT

The diagnosis in the field of medical is done by the use of image processing. So ,to get the data from the shown images is very difficult. Through the semi- supervised learning the segmentation technique will be very useful and the result can be updated by deep learning neural network. It is seen that in deep learning medical images of latent representation. CNN can be used to repsent images with less supervision, CNN uses binary image impair mechanism. CNN can be used to solve this problem containing less supervision of images involved.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 10, Issue 6, June 2022 ||

| DOI: 10.15680/IJIRCCE.2022.1006166|

III. RELATED WORK

[1] It is seen that DR is the leading globally disorder of blindness which can be prevented. There is a lot of undiagonized and not treated cases in DR here the author has developed a data- driven deep learning algorithm. According to this algorithm it checks the color fundus images and classifies them as healthy or no healthy. To implement this almost 72,000 diabetic patient fundus reports were taken to classify. This model achieved a 0.97 AUC with a 94% and 98% sensitivity and specificity, respectively. This is fully artificial intelligence data driven model [2]the DR is found mainly in working age group which has a main disorder or blindness.In this paper the author has made use of the method that is the convolution neural network that is the CNN, this method has achieved test metric performance and has achieved a validation sensitivity of 95%, in addition to this the author has also implemented multinomial Classification model. The reason to introduce this is that CNN cannot identify the mild symptoms in patients and turn it to be healthy so using this helps to classify clearly. [3] It is observed that more than 60 million people are at risk of DR, which is considered to be a vision threatening disease. The main aim of the author is to validate the performance of a automated DR in 2 sites in India. This was conducted in 2 main centres in India which included 3049 patients having diabetes. The automated DR system showed treatment for moderate and worse and DR conditions and suggested treatment accordingly. [4]DR is such a disorder which is very much threatening if it left uncheck it can lead to serious disorder like blindness and so on. In this work model training and validation was performed. This model cinsisted of image cropping ad resizing feature. [5]here the author worked on new implementation to detect DR in early stages that is the retinal screening to facilitate this we use deep learning called as the deepDR. It is the real time image quality assessment. In this work all three grading of mild, moderate and severe levels was achieved. [6] The DR is caused when high blood vessels rush to retina and which may cause severe impact on eyes in which a person can even go blind. Early detection in DR is crucial because we need to sustain thepatientsvisioneffectively. The author has used many methos like binary classification, multiclass classification, supervised ,self supervised and transform methods were used to get the qualitative results.

IV. METHODOLOGY

In this study we are going to use the 2 datasets that is the Kaggle Diabetic Retinopathy and the DiaretDB1. For the training and the evaluation purpose we use the Kaggle Diabetic Retinopathy approach upon the DiaretDB1. In the KDR it provides 88,702 colorfundus to check for training and validation. In the time of classification the 2 classes of DR levels are put into non -refundable DR and the rest are put into the RDR. The main aim of the work is improving of the lesion detection performance, rather than improving the classification accuracy. This dataset will be consisting of 89 color fundus images, this images are handled by 4 experts for the four different DR lesion types.
It can only be considered when the confidence of labelling will be exceeding more than 75%. There will be no information around the retina sphere. The black regions were cropped and it is was resized to 512 x 512 pixels. The images of training were standardized by subtracting mean standard deviation id divided.
To train images in CNN we use the open source APTOS 2019. The blindness detection fundus image dataset. The grading scale id to label the dataset. The APTOS data is all about the collecting the images of the retinal fundus from the rural areas. This was mainly used in the areas like Bangladesh because of geographical proximicity. We can see many images related to this. To the check how well it performs in the target domain of bangaladeshi patients we use 2 different datasets. First it was performed in Bangladesh eye hospital they provided with 43 images out of 23 patients to check with. There was equal distribution of they left and right eye images. They were given with Topcon angiogram. Firstly the images will be independently graded and will be treated by the specialist. As the images were given the inference was performed on the images, with the help of the algorithm by proper per processing and the data preparation. Thus funduscope was used in the hospital to collect all the fundus images , so that every image will give a clear confidence to each image with a label to proceed for the evaluation and training and also the rating can be done well.

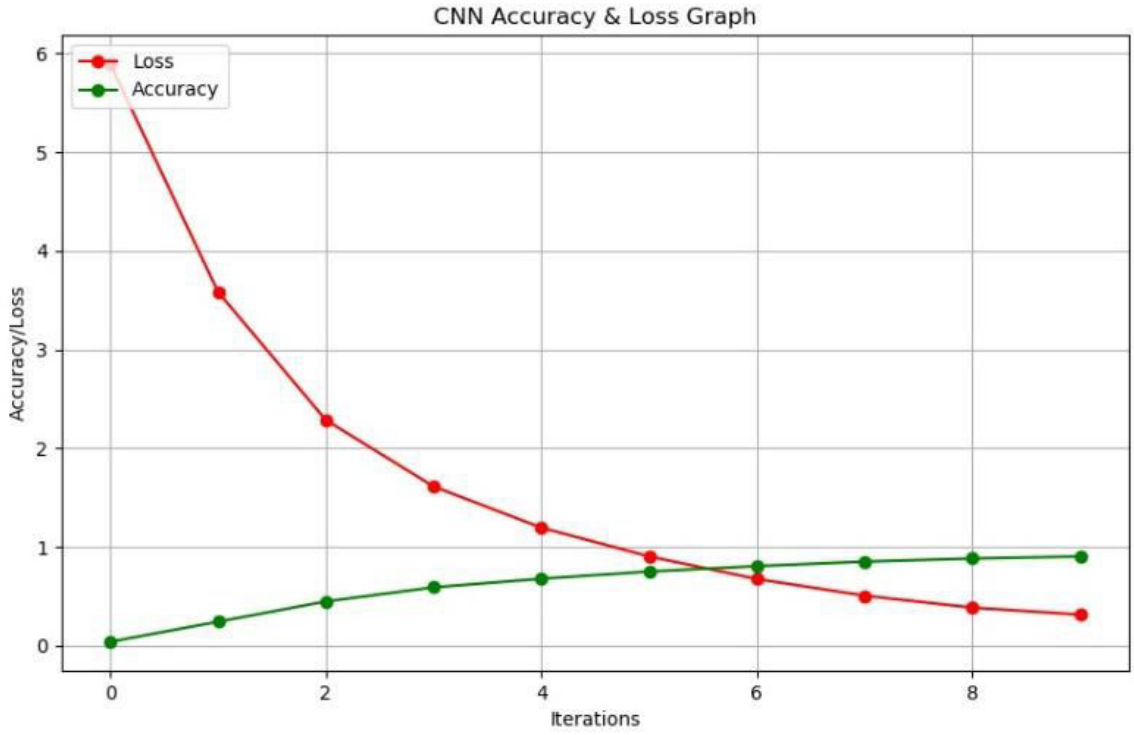
V. EXPERIMENTAL RESULTS

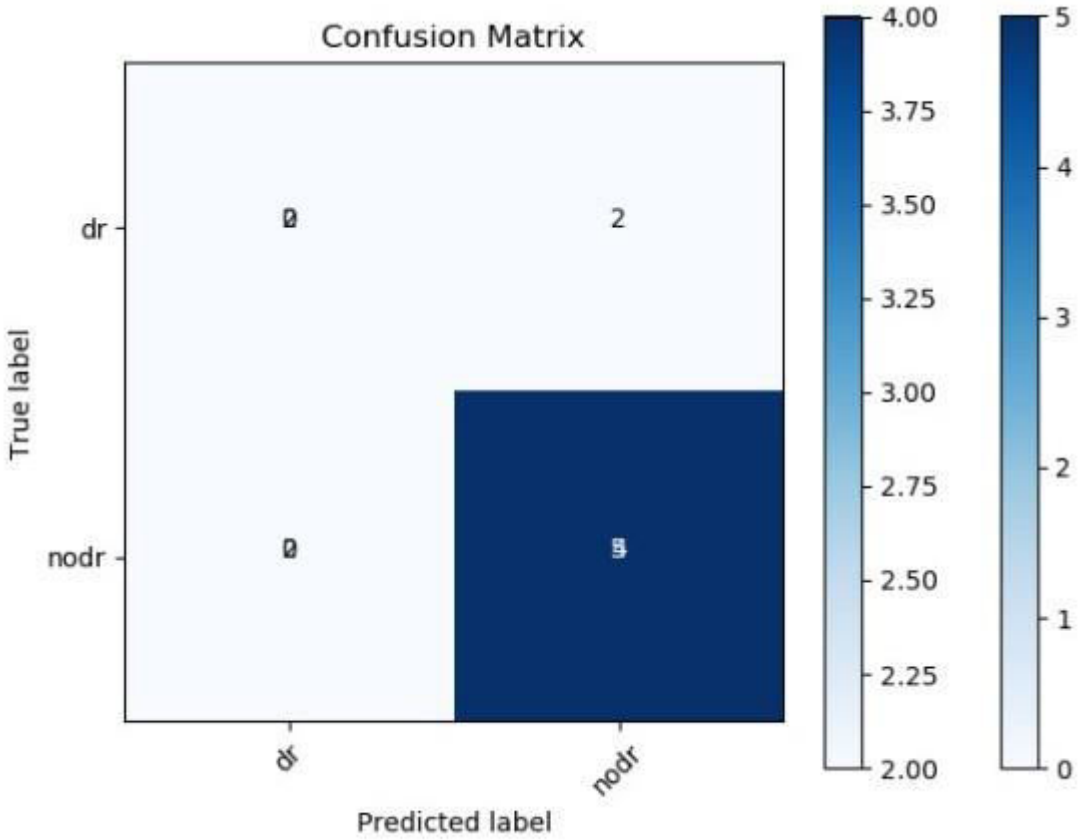
Although the outcomes on the training dataset is not the prime spotlight on this paper, we do not include deep evaluation in this paper. However, it can be noted that our CNN achieves a 96.60% accuracy of detecting the correct stage of Diabetic Retinopathy on the APTOS training set, which is impressive. However, this is an indomain checking and not in our target domain, so this result should not be focused on

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 10, Issue 6, June 2022 ||

| DOI: 10.15680/IJIRCCE.2022.1006166|





| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 10, Issue 6, June 2022 ||

| DOI: 10.15680/IJIRCCE.2022.1006166|

VI. CONCLUSION

We propose a deep understanding getting to know method that highlights areas on retinal pictures which shall indicate diabetic retinopathy to help clinical diagnosis. Our structure provide a way of means of a latest technology appearing supervised CNN structure for diabetic retinopathy type however changed to permit weakly supervised item localization. We display correct localization with excellent sensitivity whilst retaining excessive type accuracy. Along with fast structure we are hoping that our method will facilitate diagnostic queries and beneficial device for clinical diagnosis.

REFERENCES

1)Rishab Gargeya, Theodore Leng MD, MS ,2017:
2)Carson Lam, MD, Darvin Yi, Tony Lindsley ,Phd, 2018
3)PhD; Renu P. Rajan, MD; Kasumi Widner, MS; Derek Wu, BS; 2019
4)Borys Tymchenko1 a , Philip Marchenko2 b and Dmitry Spodarets3 2020:
5)Liang dang, liang Wu, Chun Cai, Yan chen 2021:
6)Mohammed Z Atwany, Abdhul Wahab H, Mohammed Yaqub, 2022:.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.165

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details