IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

EARLY STAGE DETECTION OF GLAUCOMA ILLNESS BY DEEP LEARNING APPROACH FORECASTING

Ms.G.AKALYA[1], Mrs.T.SARANYA[2], Dr. D.RAJINIGIRINATH[3]

PG Scholar[1], Department of Computer Science, SRI Muthukumaran Institute of Technology, India
AssistantProfessor[2],DepartmentofComputerScience,SRIMuthukumaranInstituteofTechnology,India
HOD(CSE/AIDS)[3],DepartmentofComputerScience,SRIMuthukumaranInstituteofTechnology,India

ABSTRACT

Glaucoma is a chronic eye disease that is the second leading cause of blindness all over the world, and a great number of people have been experiencing it. Glaucoma is a group of diseases that causedamagetotheopticnerves,whichleadstoirreversiblepartialorfullvision loss. Early detection of glaucoma is critical and highly beneficial in preventing further deterioration. Glaucoma can occur at any age and shows no early signs or symptoms, which makes it hard to detect. The final stage leads to complete blindness, and a cure has not been found as of now. So, the only way is to slow down the effects by detecting them at an early stage. And another major drawback is the limited number of glaucoma specialists in our country, which makes it even more difficult to diagnose. Due to these reasons, the project focuses on developing an Android application that takes the fund us image as an input and then predicts whether it is glaucomatous or non- glaucomatous. This system is developed using the CNN algorithm in deep learning, which includes dataset collection, sequentialmodeldevelopment,training,testing,modelconversion,andapplicationUIdevelopment.The accuracy of this model is found to be around 97%, and there are fewer false positives compared to the previous models. This project can be extended so that it can be used on multiple operating systems and be accessible through a web version. In the future, the fund us image can be extracted from the general eye image itself.

INTRODUCTION

Glaucoma is a chroniceye disease that is the second leading cause of blindness all over the world, and a great number of people have been experiencing it. Glaucoma is a group of diseases that cause damage to the optic nerves, which leads to irreversible partial or full vision loss. It can occur at any age and shows no earlysigns or symptoms, which makes it hard to detect. As it is an Android application, it is

very portable and can be used by anyone, anywhere. This system is developed using the CNN algorithm in deep learning, and then a Tens or Flow model is used in an Android application.

EXISTING SYSTEM

The existingsystemtofindglaucomadiseaseisdonemanually.Presently,itrequiresclinicaltechnicians and their appointments to analyzetheeye, and then testing is done to find the disease. As it is done manually, the diseased eye is found only at the acute stage. Due to this, the severity of the disease rises and leads to complete blindness. Glaucoma is a chronic eye disease that is the second-leading cause of blindness all over the world. It can occur at any age and shows no early signs or symptoms, which makes it hard to detect. So, the only way is to slow down the effects by detecting them at an early stage. This can be solved by automating the disease identification process using image processing techniques.

PROPOSED SYSTEM

The system proposed involves the user taking the picture of the diseased eye using a camera. The picture taken is compared with the Tflite file that is created. Tflite file is created using deep learning, here the diseases are classified into different classes by passing the image and then training the model which is present in the tflite file. After comparing the picture with the tflite file the most suitable result is displayed to the user. When the result is clicked. The system here is divided into five module as. User authentication application can be used only by the health professional. If the health professional needs to use this application, then an account has to be created by entering the details such as username, name, email id, phone number and password. The image is either selected from the gallery or captured through the camera and fed to the model. But the image has to be onlythe fund us image. It uses a deep learning model based on convolution neural networks (CNNs) to analyze the uploaded image and identify whether there are signs of glaucoma. The goal of preprocessing is to standardize the images so that they can be more easily compared and analyzed by the deep learning model.

SYSTEM ARCHITECTURE

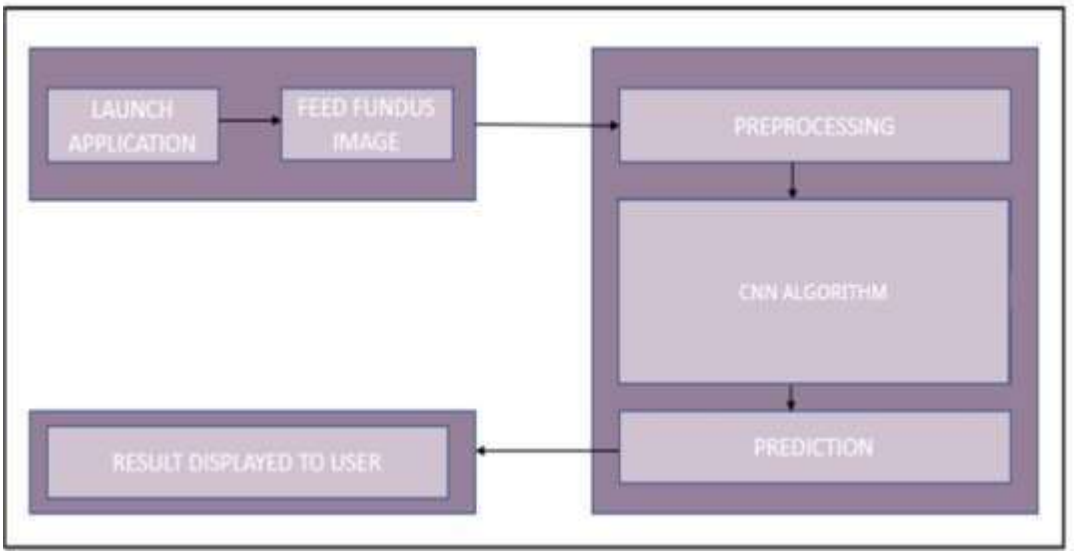


FIGURE1:System Architecture

TRAINING AND TESTING THE MODEL

Once the model has been developed, it needs to be trained on the preprocessed dataset. This involves feeding the model a set of images labeled as healthy or having glaucoma, and it eratively adjusting the model's weights and biases to minimize the error between its predicted labels and the actual labels in the dataset. In this project the available data set is divided into 8:1:1 that is 8(training data around 540 images of both classes glaucoma or healthy):1(validation data around 70 images of both classes):1(testing data around 70 images of both classes). The training process may take several hours or days depending on the size of the dataset and the complexity of the model. After the model has been trained, it needs to be tested

MODEL EXTRACTION

Once the model has been trained and tested, it needs to be converted into a format that can be used by the glaucoma detection system. This may involve converting the model from its native deep learning framework format(such as Tens or Flow) to a format that can be used by the programming language and web framework used in the application. This process ensures that the deep learning model can be integrated seamlessly into the glaucoma detection system and can provide accurate and reliable results to users

TEST RESULT

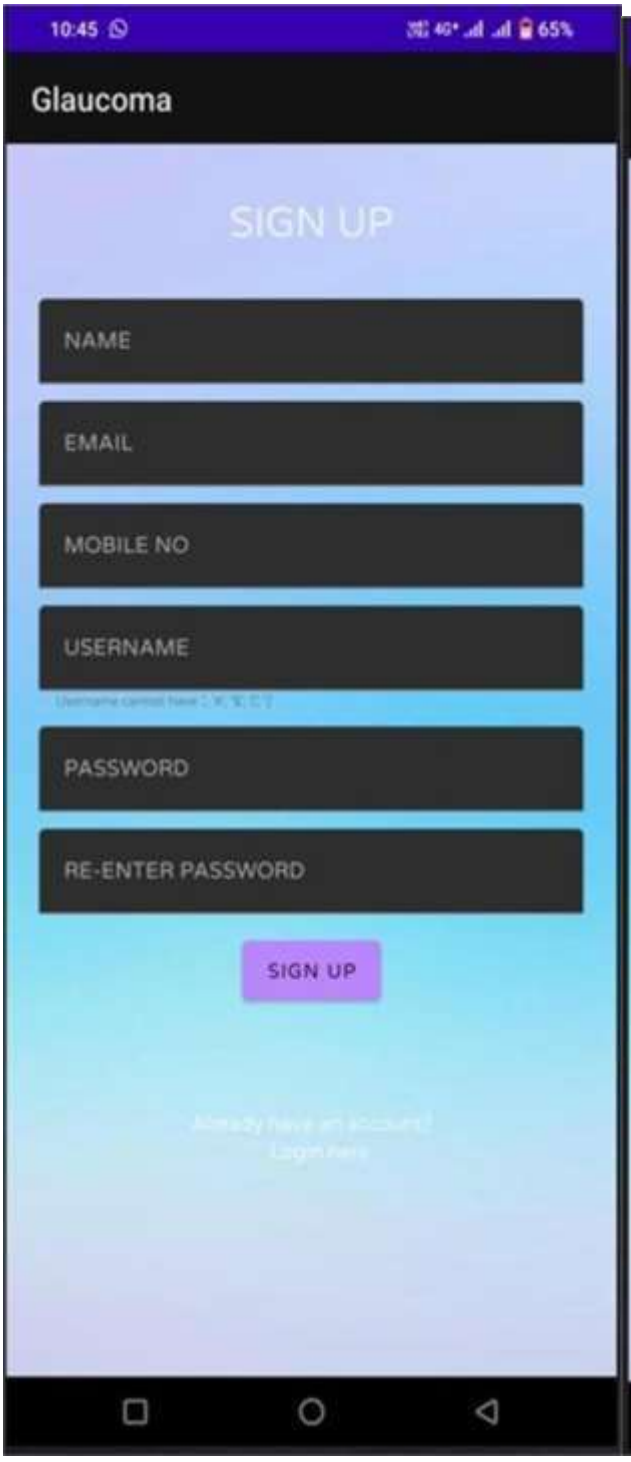
For an android application the cnn model code is tested in the test pad application where a separate project folder is created and test file is created. Then the code is pasted which provides the result. And it gave the number of error codes and legitimate code. The following is a testing done for the model which shows that all the test cases have passed successfully without any error. And the test percentage is 100%.

FIGURE2:TESTRESULT

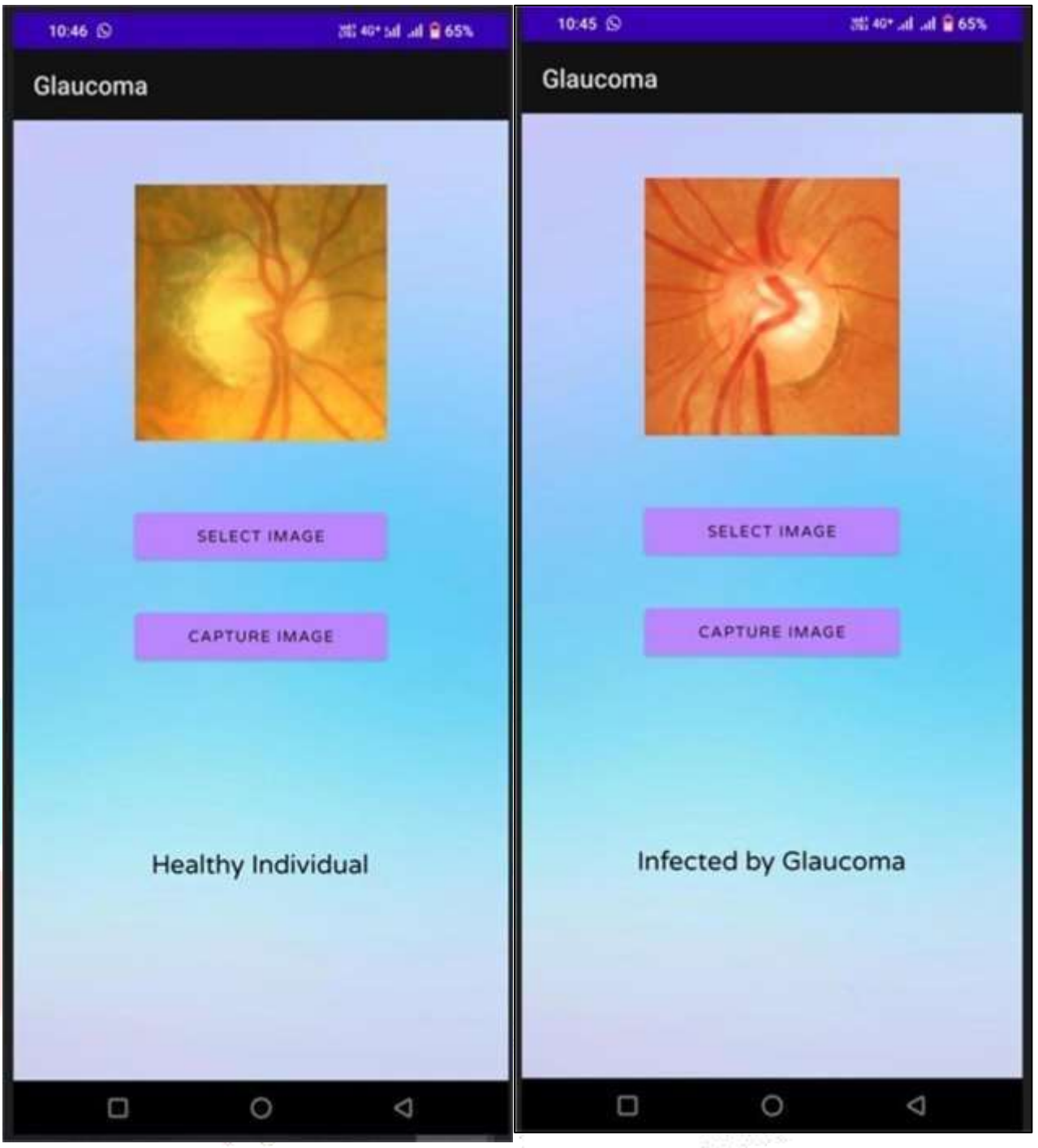
RESULT

In this module, the results of the glaucoma analysis are displayed to the user. If the CNN model detects signs of glaucoma, the user may be directed to seek further medical attention from a qualified healthcare professional. If no signs of glaucoma are detected, the user may be reassured that their eyes are healthy

SIGNUPPAGE



HOMEPAGE



POSITIVERESULT **NEGATIVE RESULT**

CONCLUSION

The development of a glaucoma detection android application using a CNN Model can greatly improve the accuracy and efficiency of glaucoma diagnosis. The glaucoma detection android application with login and sign-up functionality provides an efficient and user-friendly platform for health professionals to upload or select fundus images of patients and receive real-time results on whether the personis affected by glaucoma or not. The CNN model used in the application enables accurate detection of glaucomain fundus images through various processes such as dataset collection, preprocessing, model Theloginandsign-upfunctionalityensurethatonlyauthorizedhealthprofessionalscan access the application and upload patient data. This enhances the security and privacy of the patient data and ensures that only qualified professionals are using the application for diagnosis. Overall, the glaucoma detection android application with CNN model

provides a reliable and effective tool for early detection and diagnosis of glaucoma, which can lead to timely treatment and improved patient outcomes.

REFERENCES

1. AmerSallam,AbdulguddoosS.A.Gaid,WedadQ.ASaif,Hana'aA.SKaid,Reem A. Abdulkareem,KhadijaJ.AAhmed,AhmedY.A.Saeed,AbduljalilRadman(2021) 'Early Detection of Glaucoma using Transfer Learning from Pre- trained CNNModels'.

2. MsArkajaSaxena,MsAbhilashaVyas,MrLokeshParashar,MrUpendraSingh(2020) 'A Glaucoma Detection using Convolutional Neural Network'.

3. FaizanAbdullah, RakhshandaImtiaz,HussainAhmad Madni,HaroonAhmed Khan,Tariq M. Khan, Mohammad A. U. Khan, And Syed Saud Naqvi (2021) 'A Review on Glaucoma Disease Detection Using Computerized Techniques'.

4. Liu Li, Mai Xu, Hanruo Liu, Yang Li, Xiaofei Wang, Lai Jiang, Zulin Wang, Xiang Fan, and Ningli Wang (2019) 'A Large-scale Database and a CNN Model forAttention-based Glaucoma Detection'.

5. Mir Tanvir Islam, Shafin T. Mashfu, Abrar Faisal, Sadman Chowdhury Siam, Intisar Tahmid Naheen, And Riasat Khan (2021) 'Deep Learning-Based Glaucoma Detection With Cropped Optic Cup and Disc and Blood Vessel Segmentation'.

6. Ozer Can Devecioglu, Junaid Malik, Turker Ince, Serkan Kiranyaz, Eray Atalay And Moncef Gabbouj (2021) 'Real-Time Glaucoma Detection From Digital Fundus Images Using Self-ONNs'.

7. RahulKrishnan,Varun Sekhar,SidharthJ,GauthamSandGopakumarG(2020) 'GlaucomaDetectionfromRetinalFundus Images'.ShanmugaEaswari.S, Balamurali .S(2021)'AnIntelligentMachineLearningSupportSystemforGlaucomaPrediction Among Diabetic Patients'

8. Srisupa Palakvangsa-Na-Ayudhya, Thanan Sapthamrong, Kritsada Sunthornwutthikrai, Darin Sakiyalak (2020) 'GlaucoVIZ: Assisting System for Early Glaucoma Detection Using Mask R-CNN'.

9. Whey ming Tina Song, Ing-Chou Lai, and Vi-Zhu Su (2021) 'A Statistical Robust Glaucoma Detection Framework Combining Retinex, CNN, and DOE Using Fundus Images'.