Application For Collection Of Eye Specific Data

Guide:

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Abstract

Medical health systems have been concentrating on new techniques for speedy diagnosis. As the amount of image data in imaging centre of ophthalmology is increasing, analysing and processing these data is in need. The aim of this study is to develop a general User Interface for recording diagnostic data to facilitate auto-prediction of eye diseases. It is to ensure error-free data entry by developing a user - friendly interface. Furthermore, Machine Learning algorithms were used to analyse patient data based on multiple parameters and clinical observations. This data will be structured according to hierarchies designed by medical experts. Furthermore, the system is designed to evolve by adding new features and classifications for both symptoms and diagnosis. As many of individuals doesn't care much about their vision for this reason, there is a need for a system thereby digitise the examination by capturing images of an eye on regular basis and to facilitate auto-prediction of eye diseases so there by redirecting to the corresponding specialised and localised doctors there by preventing the misdiagnosis upto some extent.

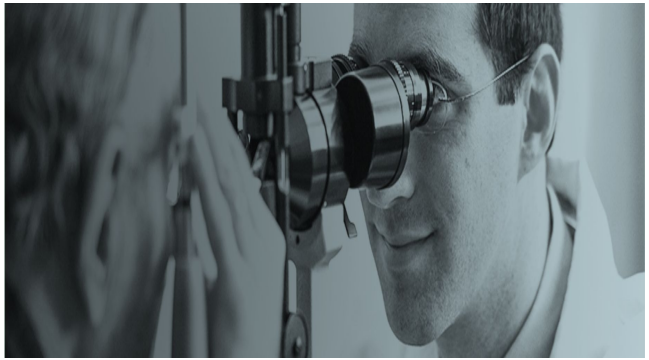
Key Words: vision problem, image acquisition, Machine learning, Artificial Intelligence, Intelligent data analysis.

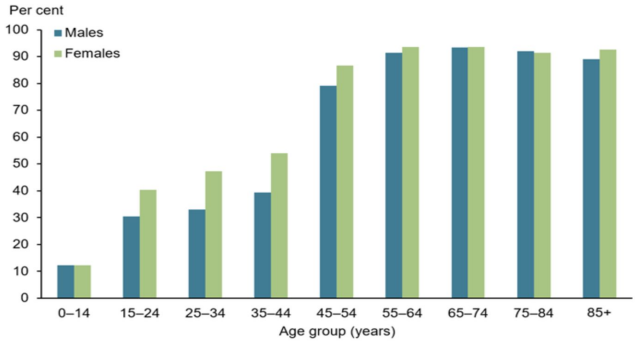
Problem Statement

To design a prototype for the first stage rapid diagnosis of eye diseases by collecting the required information from the patient , Store them for future assessments to improvise conventional treatment methods for vision problems.

Motivation

- Information availability
- Image acquisition
- Steep curve of eye problems
- Conventional diagnosis methods
- Cognitive Technologies





Objectives

- To reduce the Diagnosis time
- To reduce the Misdiagnosis Errors
- To improvise performance of conventional diagnosis methods
- To design a User interface for collecting patient data

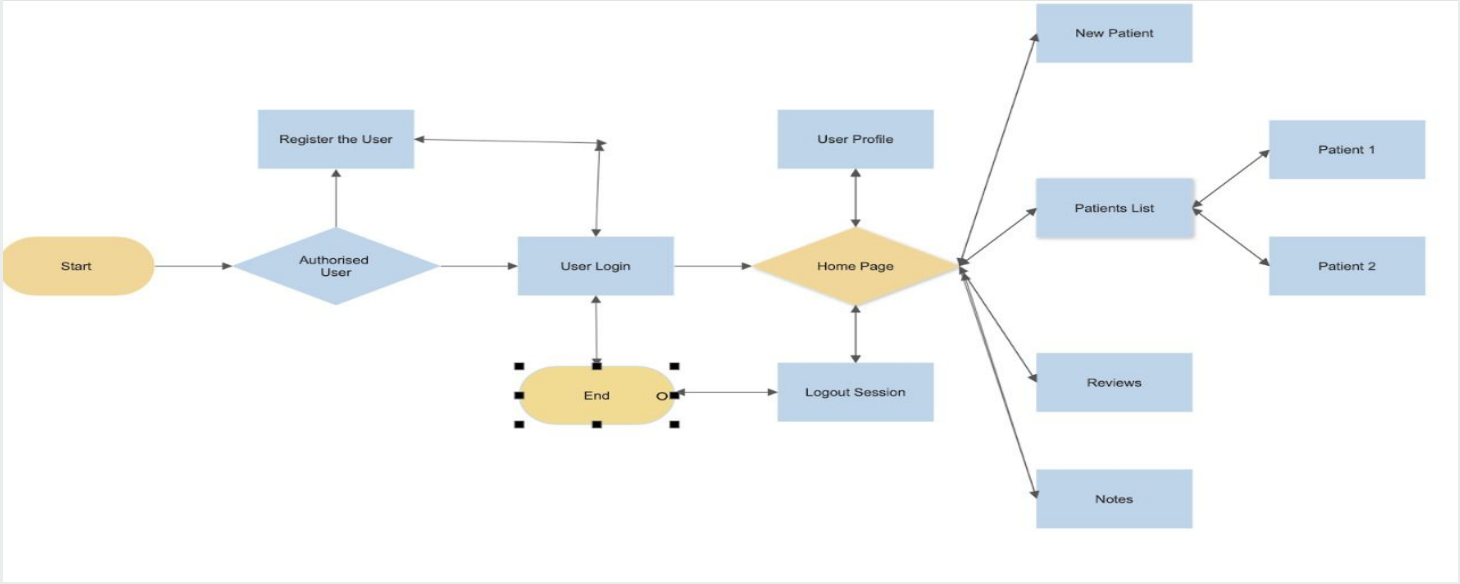
Challenges

- Diagnostic Accuracy
- Integration of Portals connecting doctors and patients
- Timing Entries of eye image acquisitions
- Retain Error free data and Storage

Scope

- Utilised to distinguish the symptoms of the patient who is experiencing with no immediate cooperation from specialists
- Productive Feedback from the specialists
- Endorsing the right medication and treatment
- To make use of data for testing and training for students to be professionals

Prototype


Start
Authorised User
Register the User
User Login
End
User Profile
Home Page
Logout Session
New Patient
Patients List
Patient 1
Patient 2
Reviews
Notes

Literature Survey

Image Acquisition and Techniques to Perform Image Acquisition by Vikas Kumar Mishra, Shobhit Kumar and Neeraj Shukla

- Proposed an Image Acquisitional Models can be used to design IOT devices
- Integrating Ophthalmology and Machine Learning Algorithms
- D-Eye :-
  UllmanIndirect
  Eye Examination
  Eyecare - Ampler Grid Eye Test

Paper 2

Intelligent data analysis for medical diagnosis: Using machine learning by Nada Lavra, Igor Kononenko, Elpida Keravnou, Matjaz Kukar and Blaz Zupan

Extensive amounts of knowledge and data stored in medical databases request the development of specialized tools for storing and accessing of data, data analysis, and effective use of stored knowledge and data. This paper focuses on methods and tools for intelligent data analysis, aimed at narrowing the increasing gap between data gathering and data comprehension. Machine learning system to be useful in solving medical diagnostic problems.

Paper 3

Image processing in bio-medical area by Isuru Suranga Wijesinghe, Jayaruwan Mannapperuma, Chamath kumarasinghe, Dhananji Liyanage

- Analyse the image
- Process the image
- Collecting error free data
- Storing the data
- Verifying the images
- Helps to improvise the treatment

Paper 4

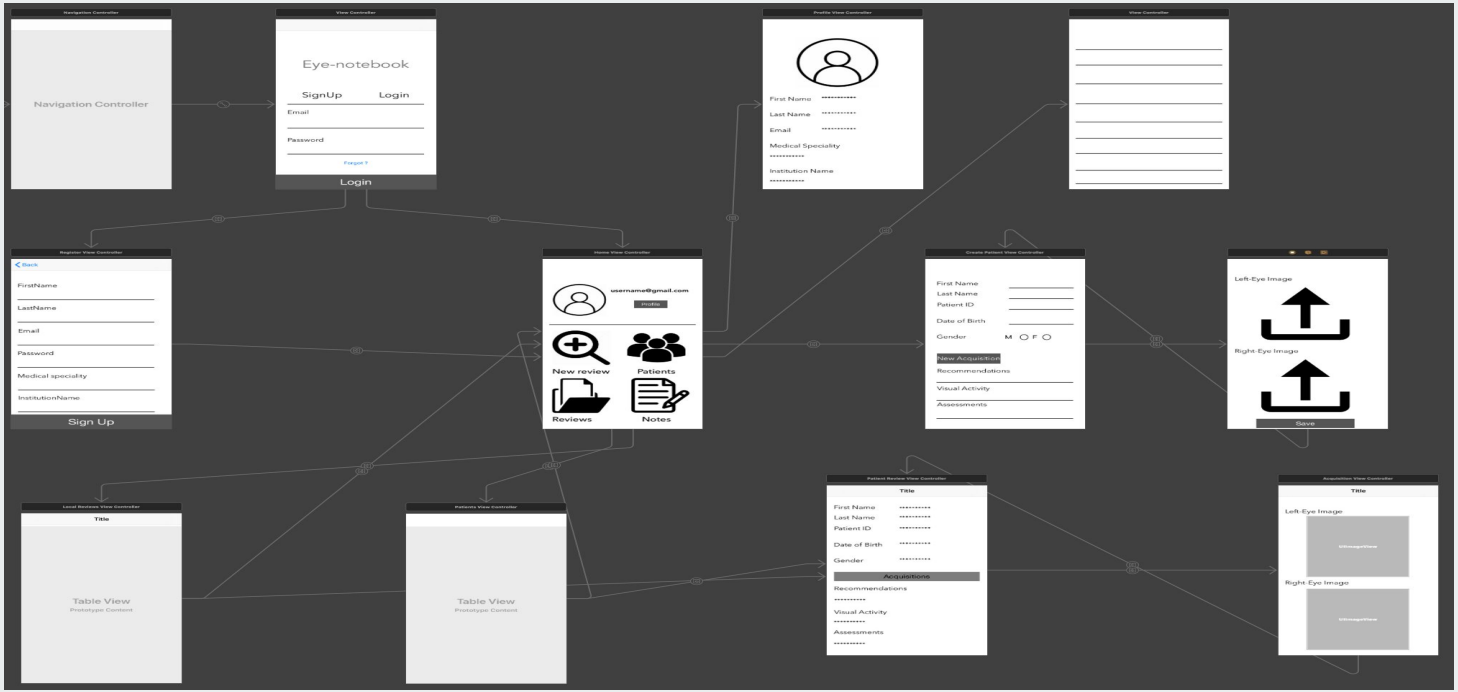
Quantitative Measurement of Eyestrain on 3d stereoscopic Display Considering the Eye foveation Model and edge information by Hwan Heo, Won Oh Lee, Kwang Yong Shin, Kang Ryoung park

- Eye following alludes to the way toward estimating where we look,otherwise called our place of look.These estimations are done by an eye tracker,that records the situation of the eyes and developments they make.
- Here we can place the camera lens on the retina for capturing the eye images in different angles.
- The focal point of the eye is followed according to the situation of the corneal reflection.
- This relative separation between the two zones permits the count of the heading of the look.

Screen -Based Eye Capturing through Glasses

- There are two chief sorts: screen-based and glasses.
- They are utilized across assortment of fields and research zones.
- Here we using the cell phones are fitted close to the eyes and permit respondents to move openly.

Prototype Design

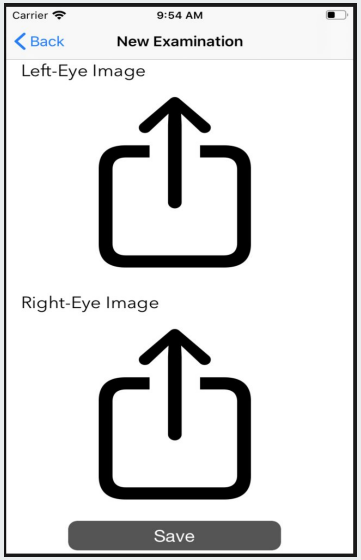


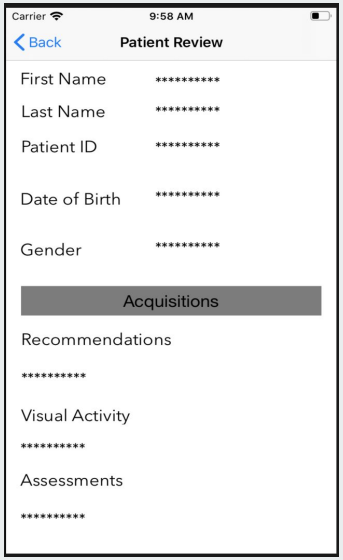
Methodology

- At first the Organisation is needed to hold and maintain the database to store the Eye specific data along with the respective Image Acquisitions
- From the corresponding domain the doctors or medical professionals are needed to register and login with their credentials
- The application allows to provide the doctor information and his/her profile details of their qualifications and domains.
- For an individual the application allows to add the basic and generic information that is necessary for further go and list the patient on to the patient list of the corresponding doctor.

- After entering information, the application provides the feature that allows the doctor to add the image acquisition of the Eye (left eye, right eye) along with the information that is provided.
- The acquisitions along with the corresponding data that will upload to the central database that is maintained by the respective organisation.
- The data with the provided information is used for further analysis to get knowledge and to provide solutions based on the respective cause.
- The data that is stored is also used to improvise the existing solutions and can be organised and examine to extract the knowledge.

Implementation:





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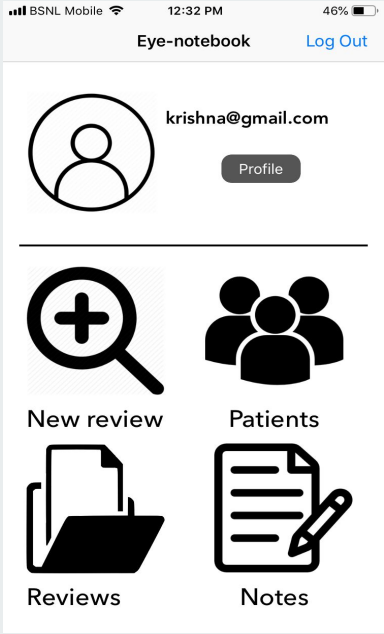
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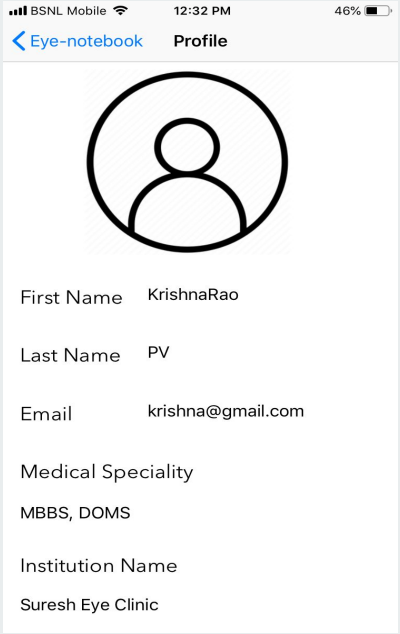
Patients
Reviews
Notes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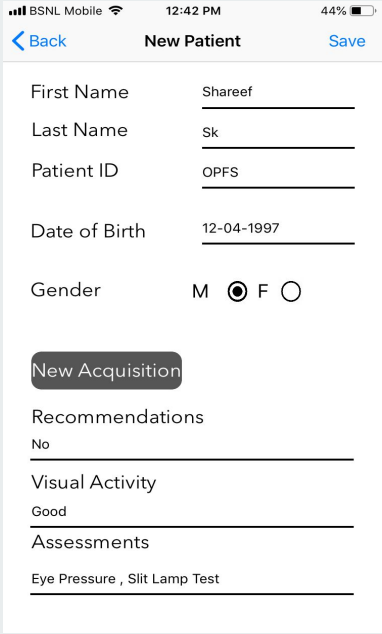
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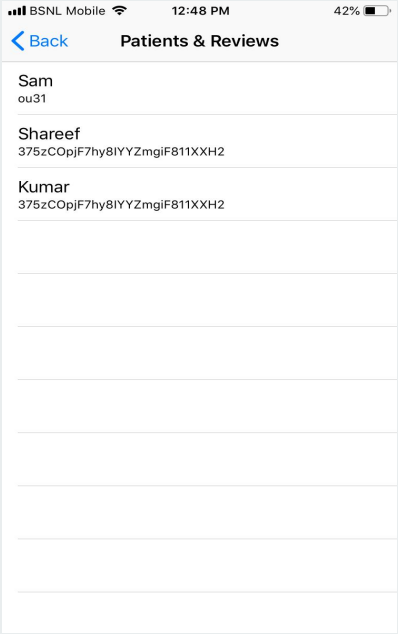
Assessments
Eye Pressure , Slit Lamp Test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Back **New Examination**

Left-Eye Image

Right-Eye Image

Save

BSNL Mobile 12:49 PM 42%

Patients **Patient Review**

First Name Shareef

Last Name Sk

Patient ID OPFS

Date of Birth 12-04-1997

Gender Male

Acquisitions

Recommendations

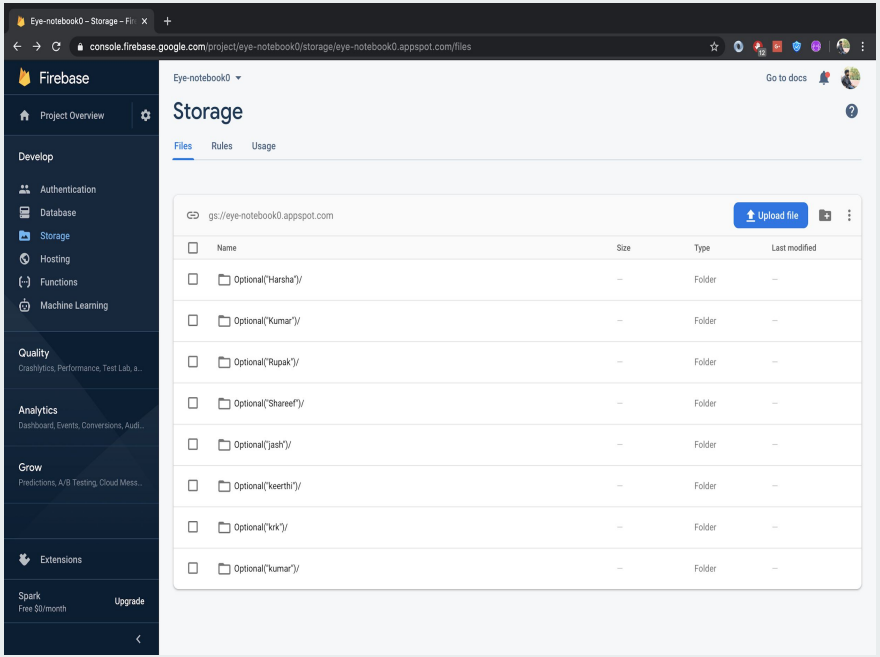
No

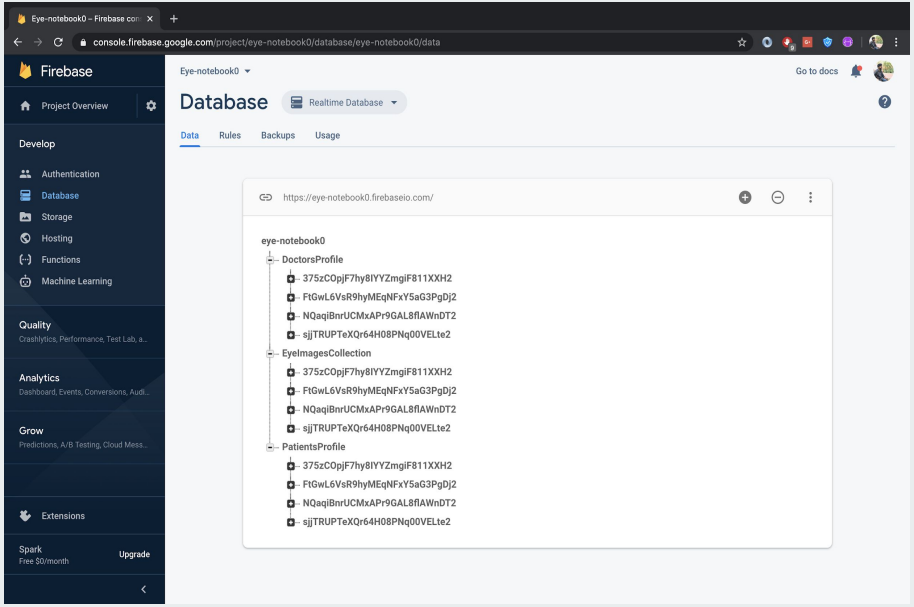
Visual Activity

Good

Assessments

Eye Pressure , Slit Lamp Test

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Project Overview
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Grow
Predictions, A/B Testing, Cloud Mess...
Extensions
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Free $0/month
Upgrade
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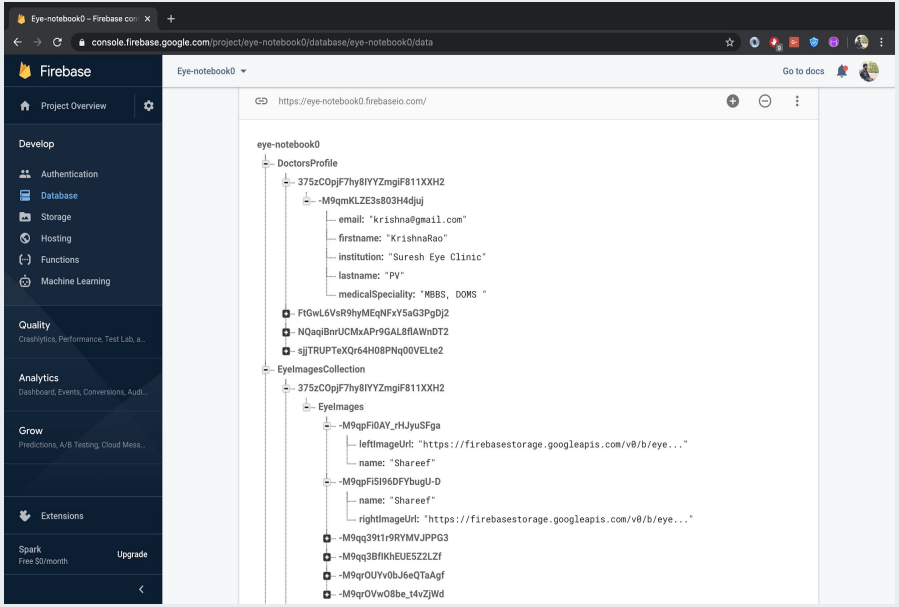
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Advantages :

- Knowledge is shared
- Misconceptions are reduced
- Decision making can be accurate
- Analysing the condition

Result and Analysis

- Gathering and maintaining the data.
- Data accumulated is used for doctor’s reference and the research.
- It makes the treatment easy.
- It helps the organization for the future reference.
- The data in the database is used as a reference for the students who are pursuing in this field.

CONCLUSION AND FUTURE WORK

- A typical software is installed on a powerful computer i.e ML Server which can be accessed through internet.
- Collecting data from various data sources like hospitals,physical diagnosis,localised patients.
- The input data is uploaded into the ML Server and it is stored in a corresponding structure format.
- Depending on the complexity of the data analysis and processing speed of the server the data is been classified.
- The analysed patient data based on multiple parameters and clinical data is displayed with progress of what's the occurrence of diseases and symptoms.

CONCLUSION AND FUTURE WORK

- Based on the regular basis examining on the patient data to facilitate auto-prediction is done.
- The output can be accessed via internet and redirecting the data to the corresponding specialised doctors.
- Precautions are provided to the patient to avoid suspected cause.
- Ophthalmologists should know about the AI and Machine Learning resources available to them to improvise their knowledge.

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Thank
you