

AN OCULAR MALADY



A simple solution to a Perplex Problem

MEET THE TEAM & ROLES

TEAM NAME: HIGH FIVE (TEAM-133)

A Mohan Kumar

Designing and Research

Adithya Mathialagan

Data pre-processing and Implementation with proper documentation

Akshay C

Dataset collection and Research

Sathyanarayana R K

Designing, Research and Dataset collection

Suhas T J

Dataset Collection and Data model implementation



PROBLEM STATEMENT

Eye diseases are a significant global health problem, affecting **millions of people worldwide**.

Imagine a world where eye diseases are diagnosed and treated at an **early stage** before the symptoms appear, reducing **the risk of blindness** and improving the patient's conditions well in advance.



PROBLEM STATEMENT

- Is it possible for any normal user with **no medical knowledge** to take a picture of his/her eye and ensure their eye is healthy **FREE OF COST** ?
- Can other diseases like **Jaundice** be detected using eye images?
- It is difficult for **medical professionals** to identify eye diseases at an early stage, which can lead to a delay in treatment.

Is it possible to speed up this process?



WHY THE PROBLEM OCCURS

UNAVAILABILITY

Many people live in remote areas where eye care is **not easily accessible**, making it difficult for them to seek medical attention.

NEGLIGENCE

Most of the eye diseases often do not have any **"serious" symptoms** in the early stages. This can make it difficult for people to realize that they actually have a **problem**.

COSTS

When it comes to the problem of the eye, sufferers are generally discouraged from seeking medical attention keeping the **costs** associated with diagnosis and treatment in mind.

RISK FACTOR

Many people fail to understand that they are at a **risk** of developing an eye disease.

ILL EYE IDENTIFIER

- Categorized searching of vision impairment.

Know what you're headed for with a click of a pic !

One application to detect multiple eye diseases.

A tiny anomaly in your eye could actually turn out to be serious if you don't figure out what it is.

A Machine Learning model which tells what eye disease you can develop into based on the pic you'll upload.

LOGO



THE SOLUTION

AI-powered eye disease classifier that uses deep learning algorithms to analyze images of the eye and accurately classifies as well as detects complex eye diseases.

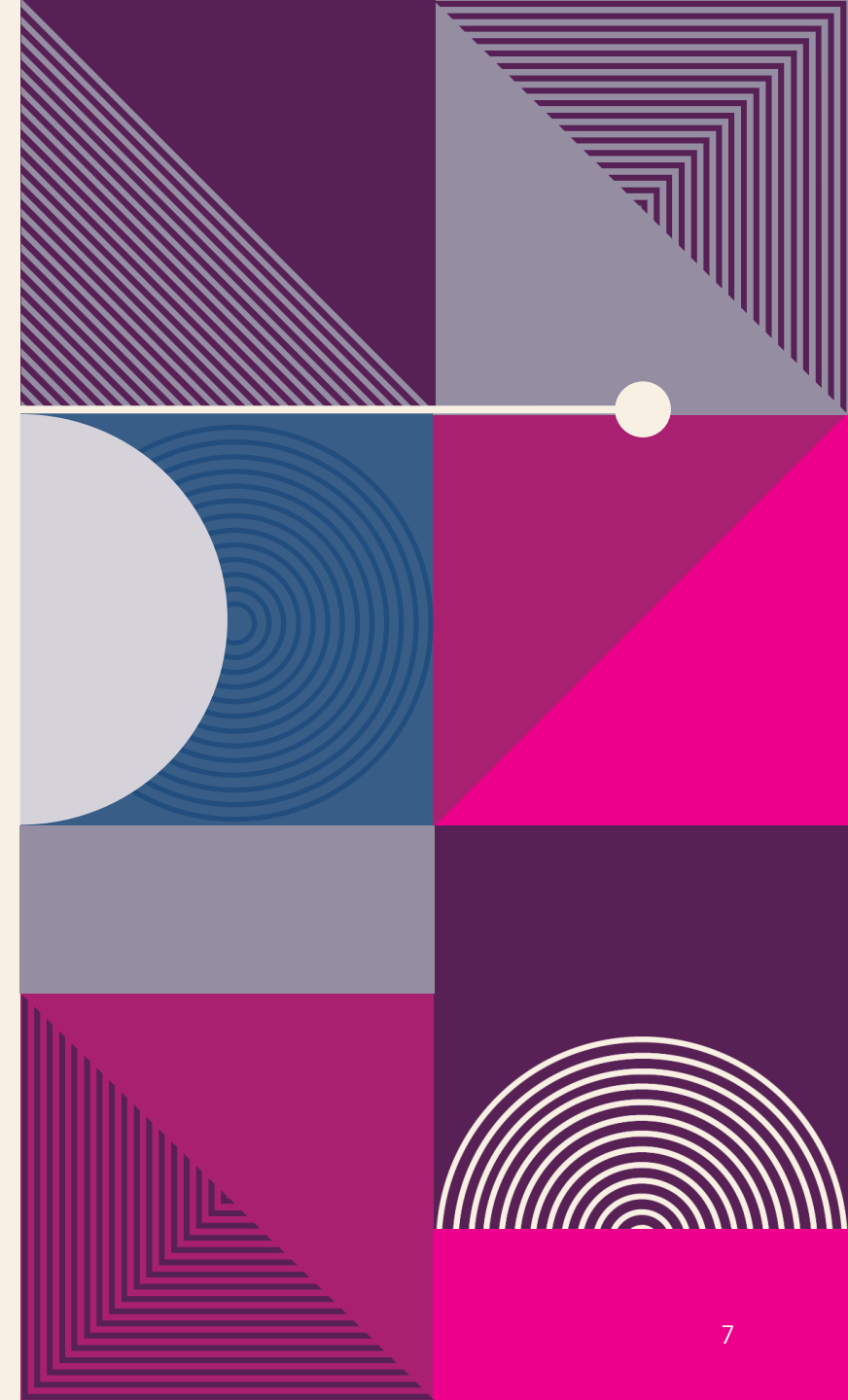
Dataset Details: We created the dataset on our own by web scraping google images as well as combining some available datasets.

It consists of 10 folders, where each folder contains around 150+ images for each type of eye disease.

The following steps were done to solve the problem mentioned in the previous slides:

1. Importing Required Modules
2. Loading the dataset
3. Understanding the Data
4. Scaling and Splitting the data into Train and Test
5. Building the Models (CNN, YOLOv3, ResNet, MobileNet)
6. Testing the Models

Please look into the Jupyter notebook for complete details.



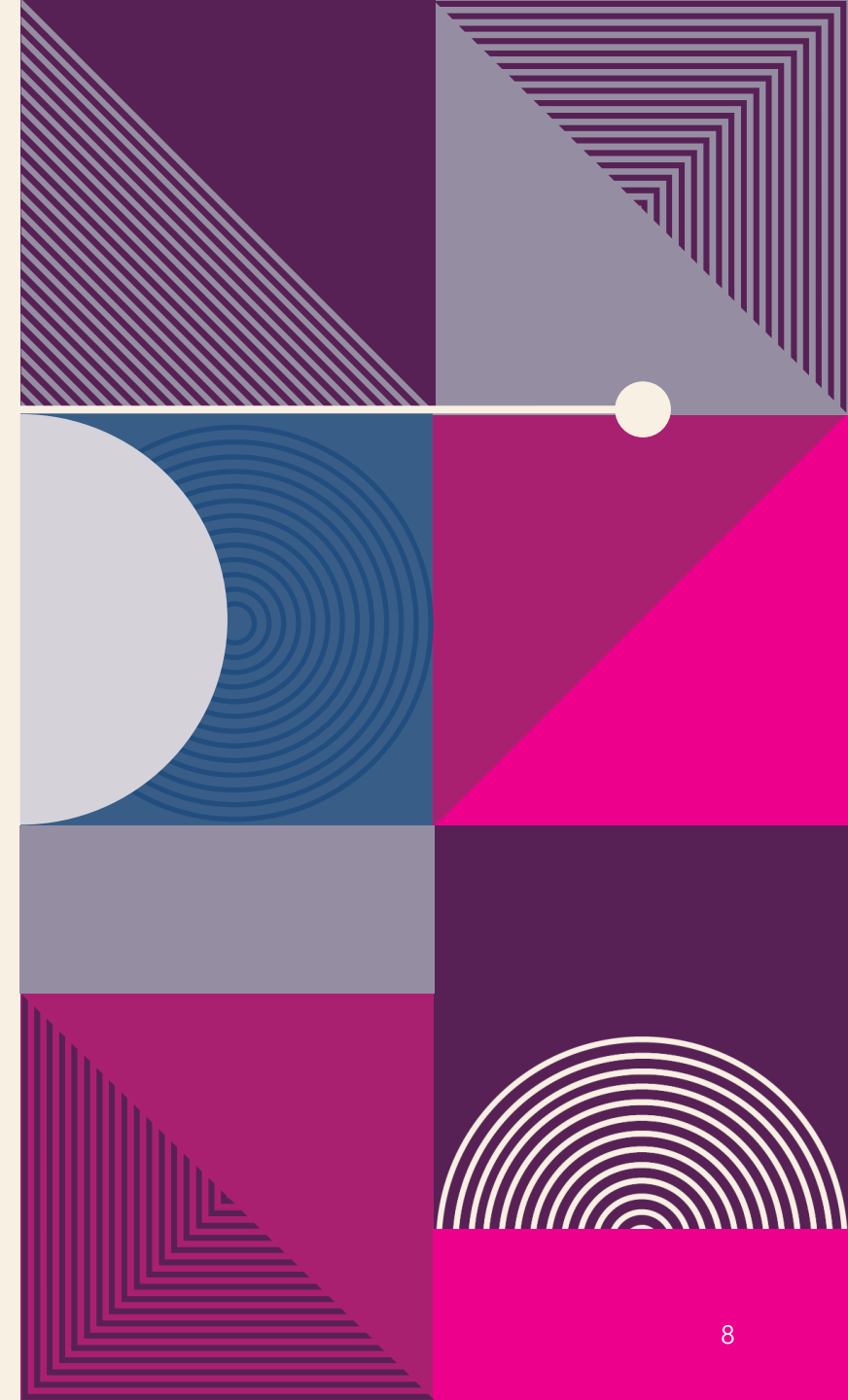
WOW FACTOR

Many machine learning (ML) based eye disease classifiers created in the past concentrate on helping medical practitioners diagnose and cure eye ONLY ONE SPECIFIC illness.

But our project is tailored for the general public who cannot afford healthcare services or remain unable to visit doctors due to negligence or fear.

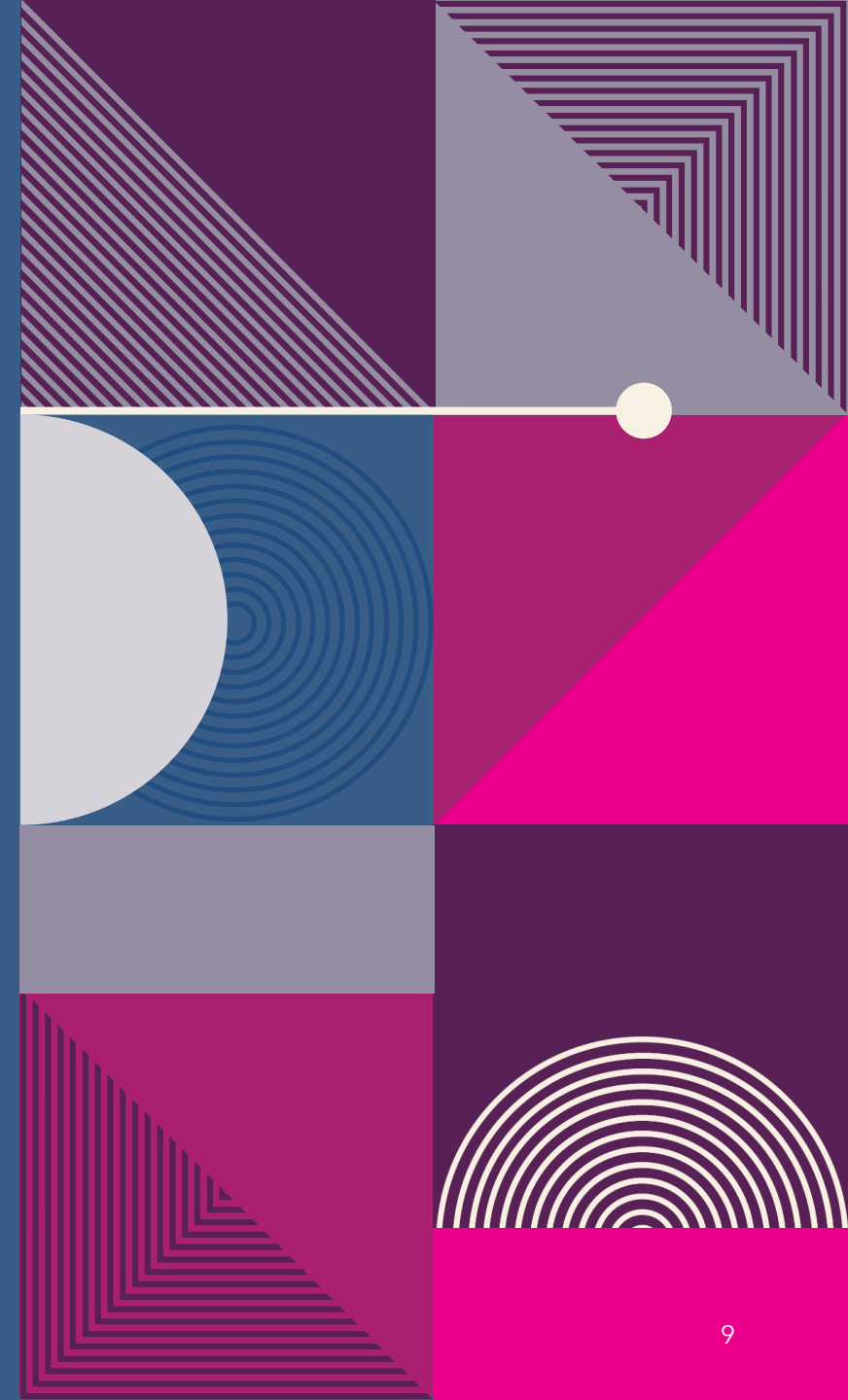
Using our solution:

- We can detect any disease in the human based on the picture of his/her eye !!
- Provide people accurate results of what's wrong with their eye without them having to feel embarrassed in revealing to anyone and detect other diseases like Jaundice using eye images.
- Medical professionals can identify eye diseases at an early stage at a much faster speed using our models.
- Any normal user with no medical knowledge to be able to take a picture of his/her eye and make sure their eye is healthy at **zero costs**.



LEARNINGS FROM HACKATHON

- We, as a team learned to work with **coordination** and learnt technical skills to accomplish the task together.
- Implementing our innovative ideas by coding helped us to enhance our **problem-solving skills**.
- While presenting the PPT, we became clear how to do it from a **user's perspective** to make it easier to understand.
- Technologically, explored cutting-edge deep learning methods like YOLOv3, ResNet and MobileNet.
- **Contributing to social causes builds our responsibility for those in need.**



FUTURE WORK

- Increasing the amount and variety of data collected, such as photographs shot in various lighting situations or from various ethnic groups, can aid in the model's generalisation.
- By adding additional modalities like depth data or thermal imagery, will make the eye disease detection more effective.
- Domain adaptation approaches can be applied to adjust the model to a new environment if the eye detection system is to be deployed in a place that is entirely different from the place it was trained on.
- Building a user-friendly application around this model inclusive of many more features for a wider audience.
- Recommending the dietary measures and necessary precautions a person can take to prevent the aggravation of the eye disease's condition.



FUN MOMENTS DURING HACKATHON



Overall, the hackathon made us enthusiastic in exploring the various challenges faced by the society and kept us driven in developing easily accessible and meaningful solutions.

As tech students, we felt great joy in serving our society by delivering sophisticated solutions through Code.

An abstract geometric design on the left side of the slide. It features a dark blue background with various geometric shapes and patterns. A white circle is positioned near the top left. Below it, a light blue semi-circle is visible. To the right of the semi-circle, there is a pink triangle with diagonal lines. Below the semi-circle, there is a pink square with a pattern of concentric lines. To the right of the square, there is a light blue triangle. Below the square, there is a pink triangle. To the right of the triangle, there is a dark blue triangle. The overall design is modern and minimalist.

THANK YOU