

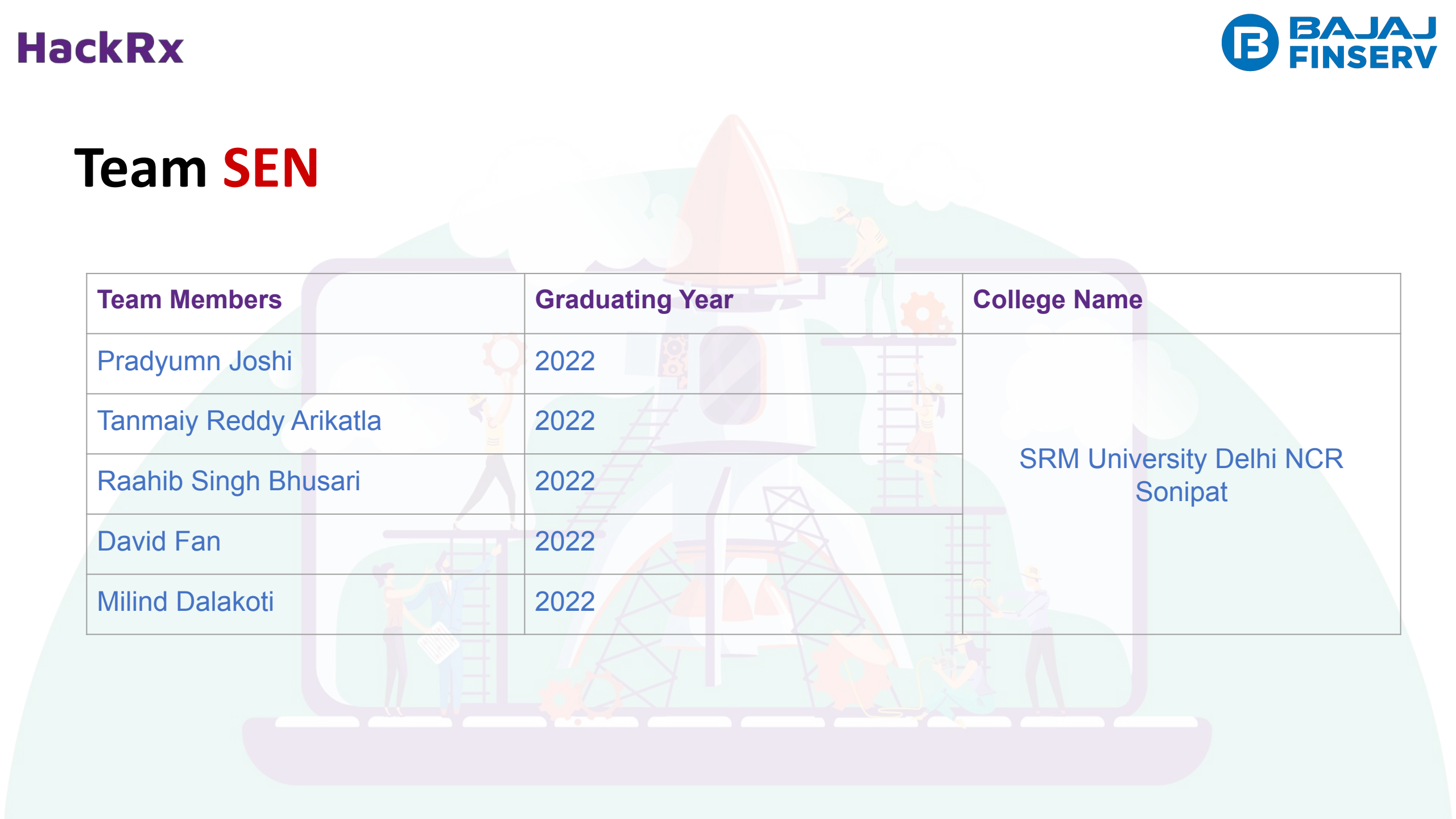


# Face Detection Algorithm

Team **SEN**

SRM University Delhi NCR Sonipat

## Team **SEN**



Team Members	Graduating Year	College Name
Pradyumn Joshi	2022	SRM University Delhi NCR Sonipat
Tanmai Reddy Arikatla	2022	
Raahib Singh Bhusari	2022	
David Fan	2022	
Milind Dalakoti	2022	

## About our Team

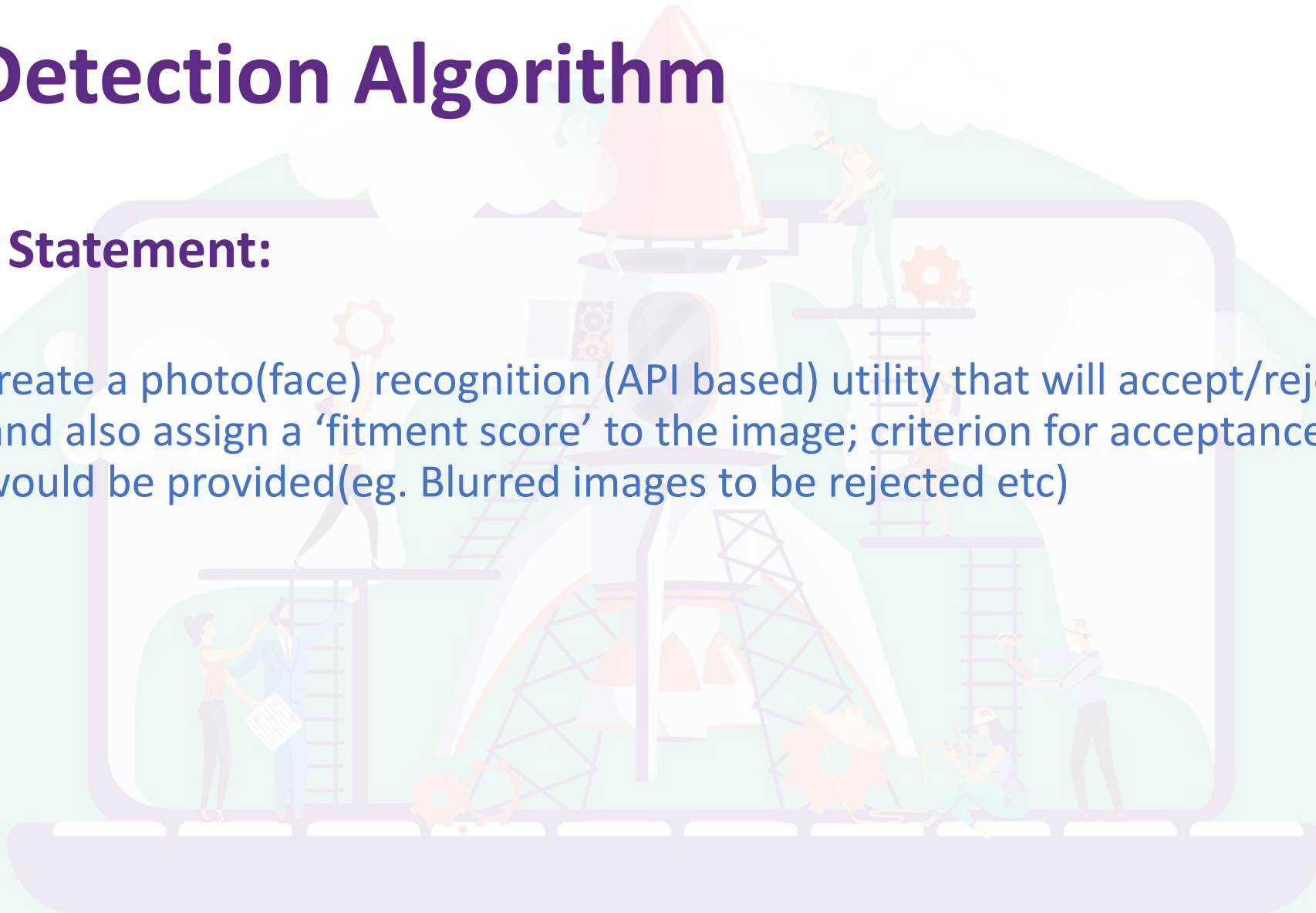
- **Projects we've worked on:** Face Detection using OpenCV, Discord Bot, Sports Person Classifier, Chatbot using Watson Assistant, Object Detection using IBM Watson Studio, TranslatorBot using IBM Node Red, Database App using Java
- **Hackathon experiences:** Challenge ACI Hackathon by GRIET, Analytics Vidhya Job-A-Thon
- **Awards:** IBM Cloud Application Developer(Mastery Awards), IBM Practitioner Awards



# Face Detection Algorithm

## Problem Statement:

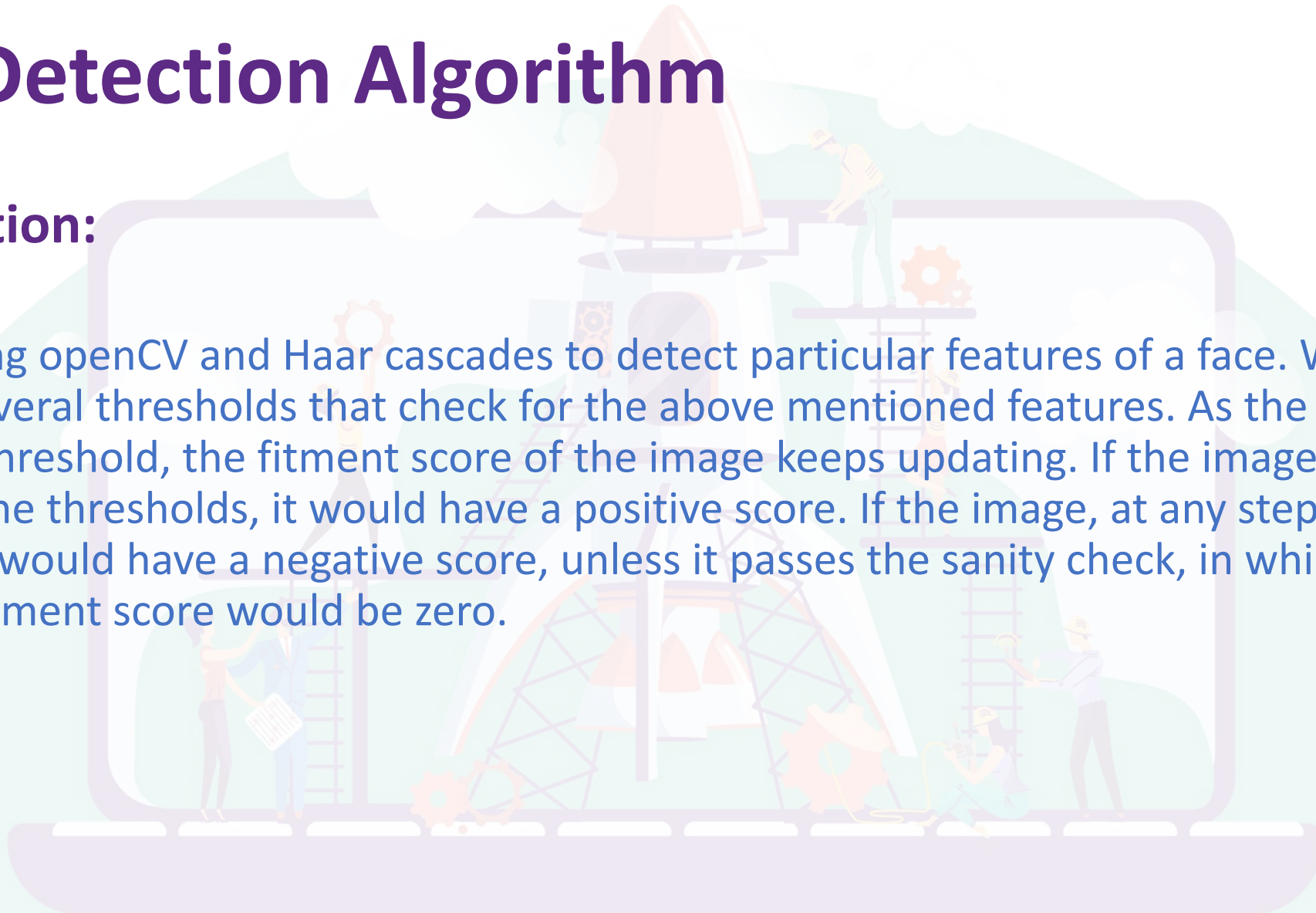
Aim is to create a photo(face) recognition (API based) utility that will accept/reject an image and also assign a 'fitment score' to the image; criterion for acceptance/rejection would be provided(eg. Blurred images to be rejected etc)



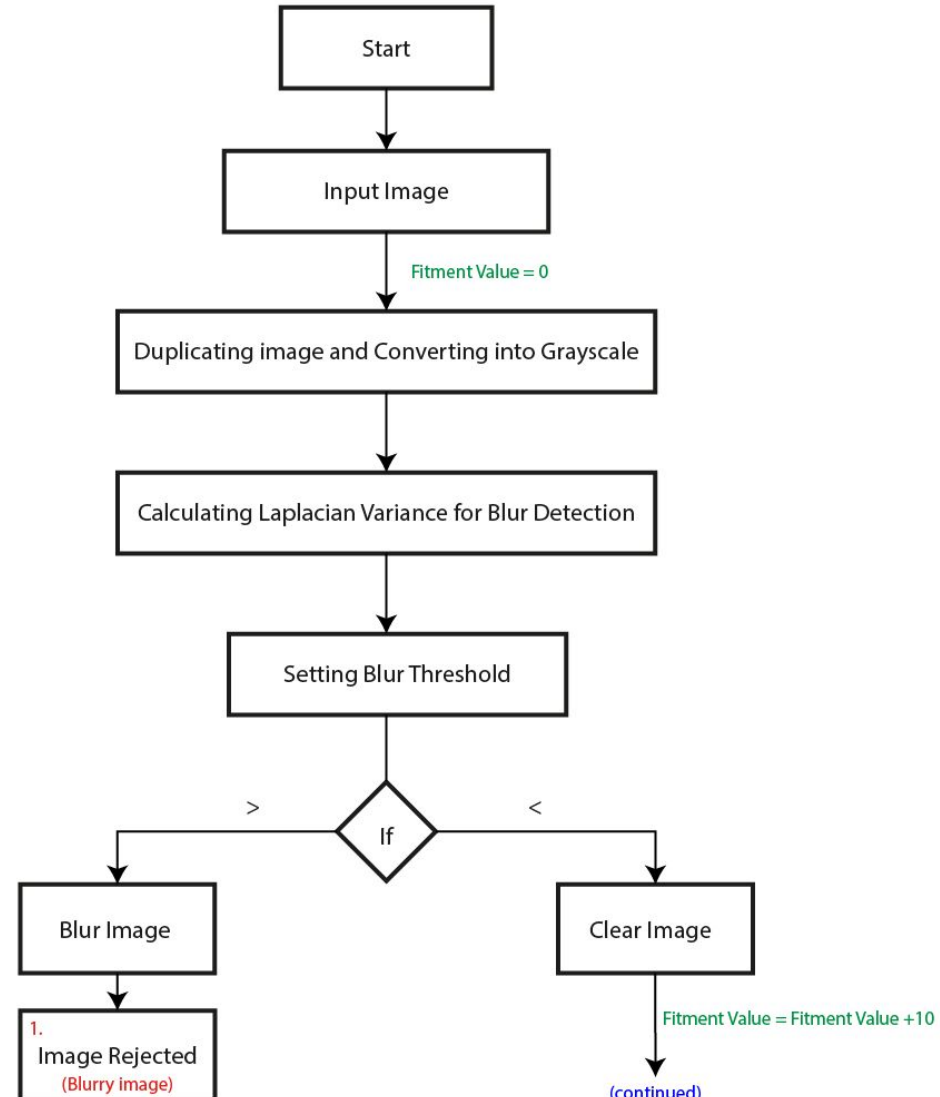
# Face Detection Algorithm

## Our Solution:

We are using openCV and Haar cascades to detect particular features of a face. We have set several thresholds that check for the above mentioned features. As the image clears the threshold, the fitment score of the image keeps updating. If the image passes all the thresholds, it would have a positive score. If the image, at any step, gets rejected, it would have a negative score, unless it passes the sanity check, in which case, it's Fitment score would be zero.

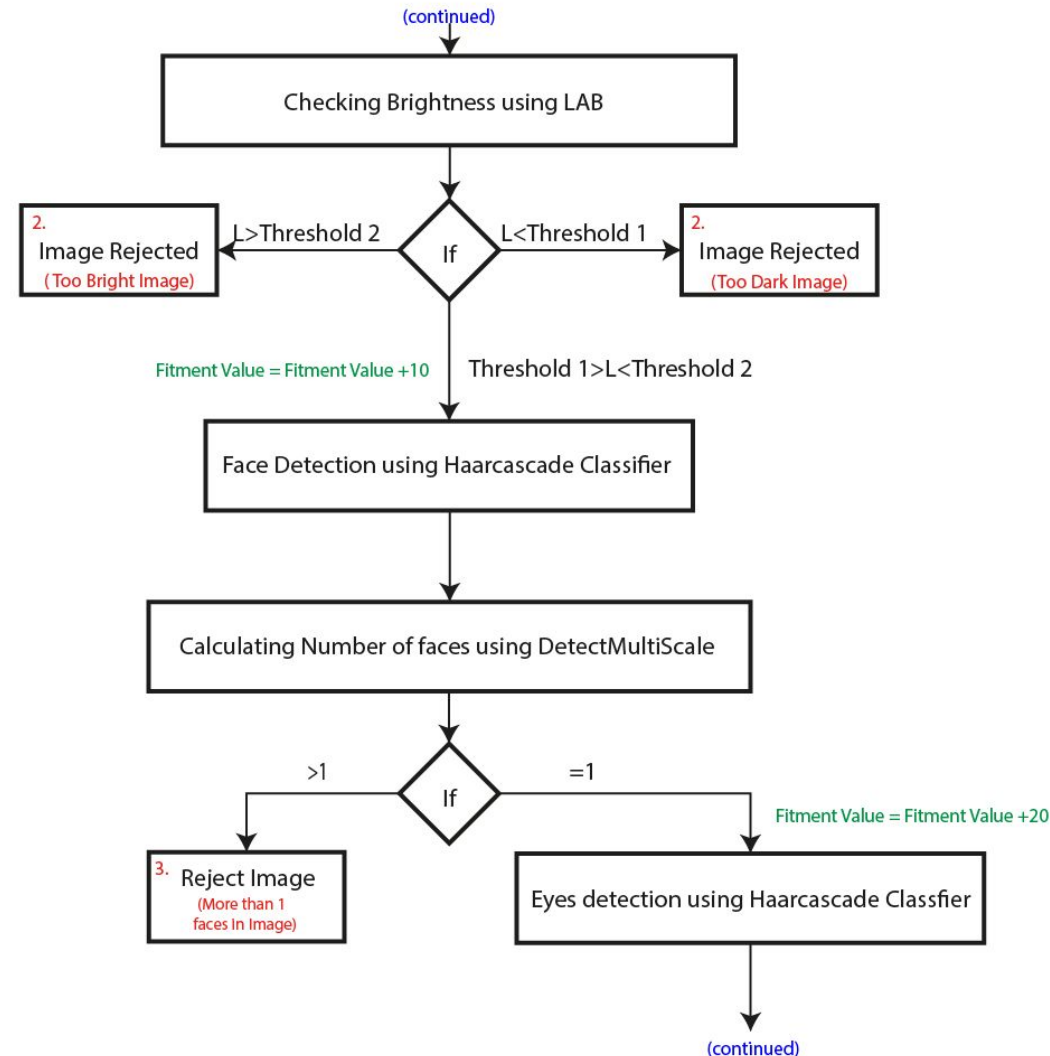


# HackRx Process Flow



# HackRx

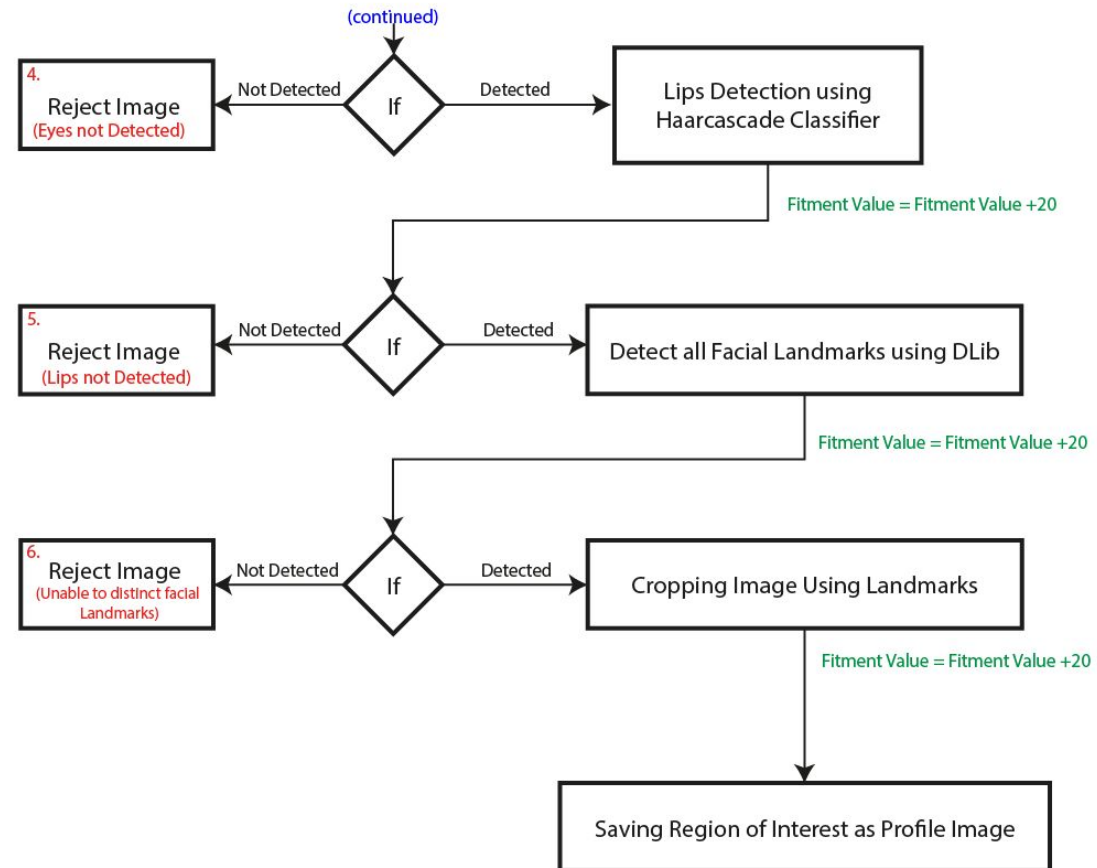
## Process Flow(Cont.)





# HackRx

## Process Flow(Cont.)





# Objectives Covered

- Identify if picture has an any obstructions in face area (e.g.: mask, sunglasses, hand covering face)
- Identify in picture if face region is blurred.
- Identify number of people present in picture.
- Differentiate avatar/cartoon images from real human faces.
- Reject picture that have a face, but face is part of a poster, or id card..
- Identify very small face regions from picture and enlarge to create a thumbnail.



## Tech Stack

### Backend

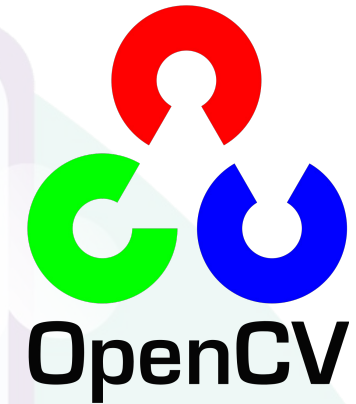
- Flask
- Nodejs
- Opencv
- Dlib
- Imutils



Flask



node



OpenCV

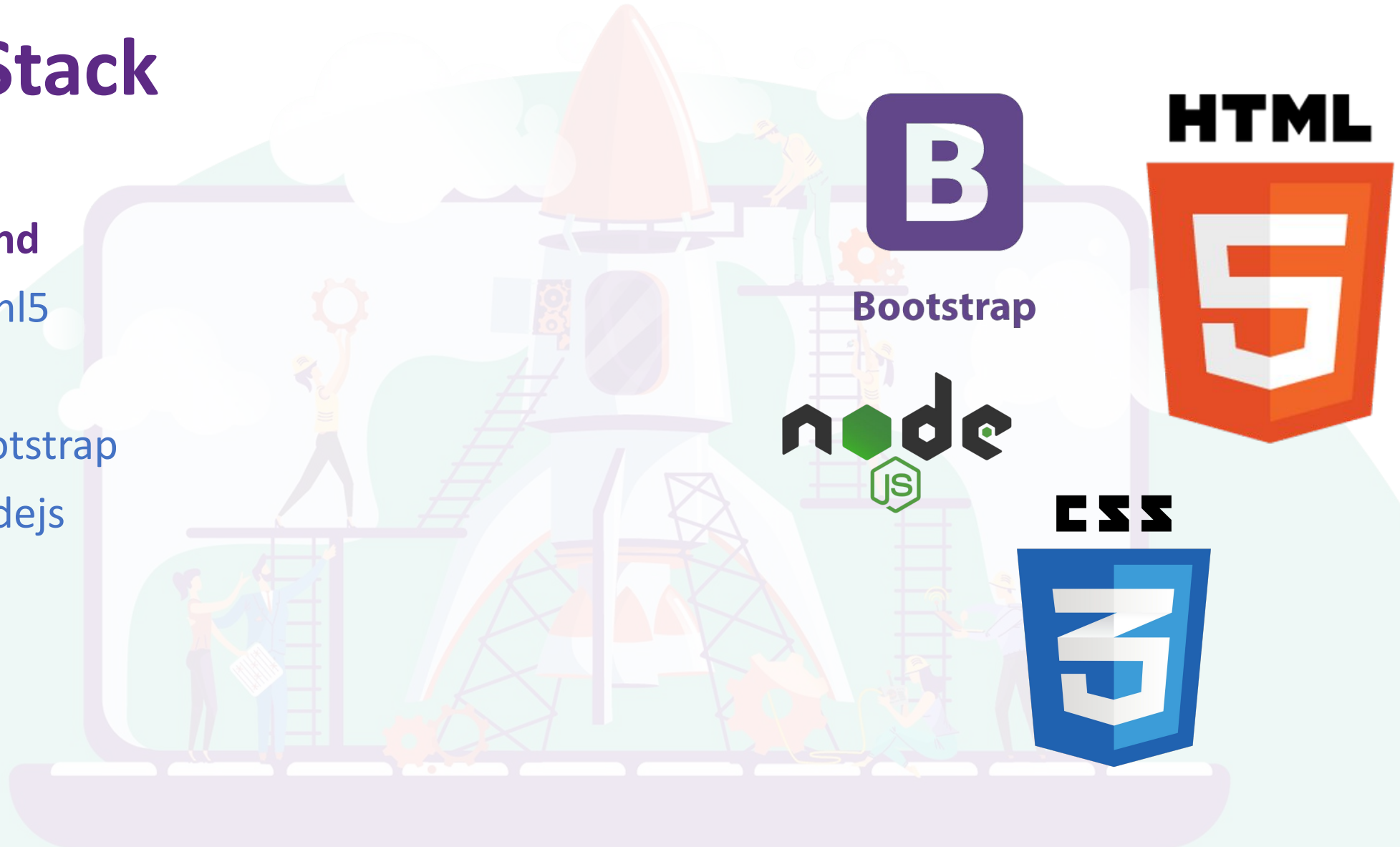


Dlib

## Tech Stack

### Frontend

- Html5
- Css
- Bootstrap
- Nodejs



## Tech Stack

### Cloud Service Providers

- Heroku

### Database

- MySQL



**HEROKU**



# How is our solution different?

The USP of our approach is simplicity and accessibility. Since the range of the doctors in the database is huge, we have to cater to all of them. We aim to create a program that is easy to use, not only for the user but also the administrator. Our plan is to keep it as simple as possible, so that any modifications, whenever needed, don't take a lot of time and effort. Another reason to keep it simple is since our product would be used by a wide variety of people, who would have ranging technical skills, we want to make sure everyone can benefit from our application.





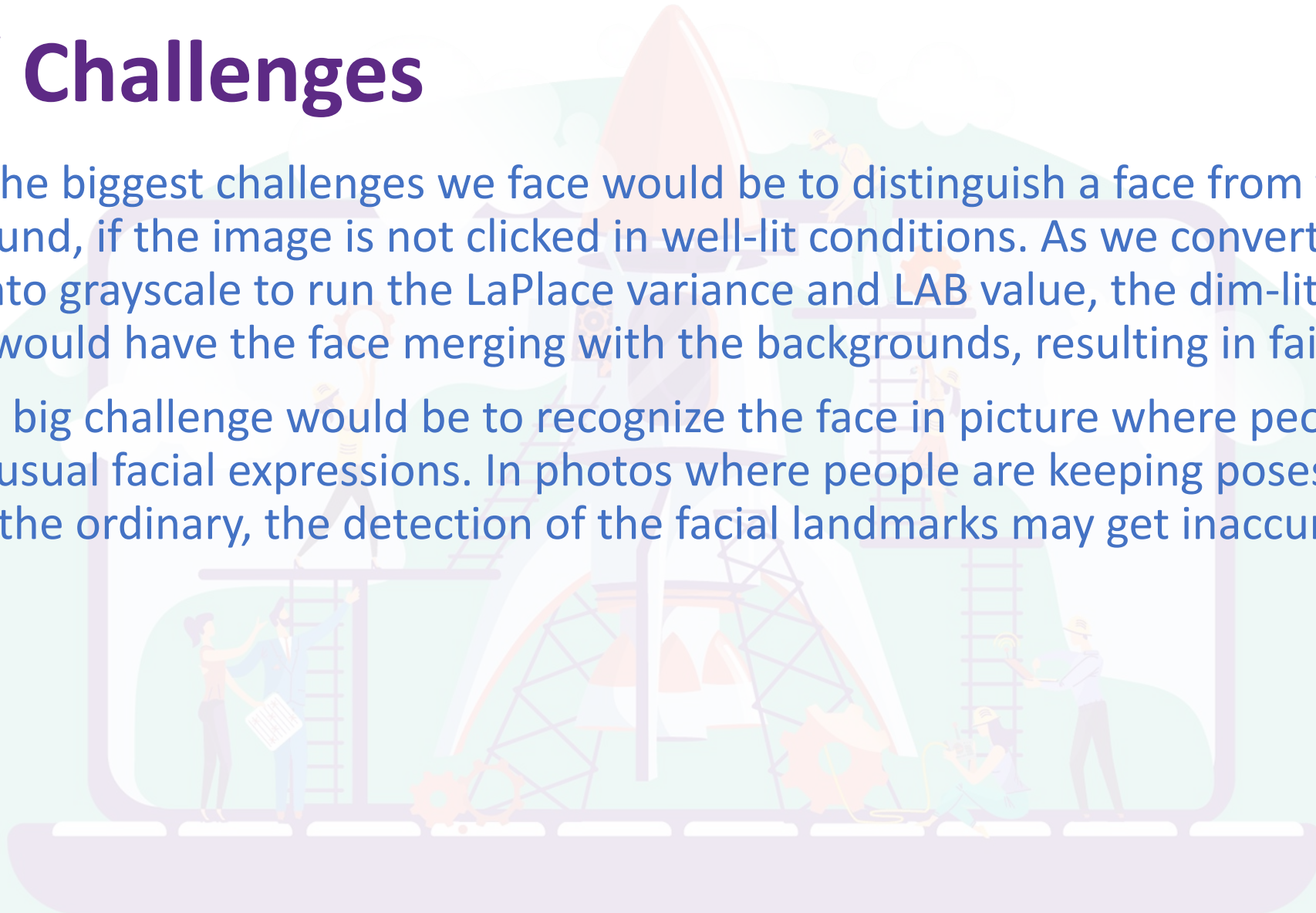
# Future possible enhancements

Please mention possible enhancements that you foresee in future

- Database Management: One of the biggest challenges in any application is database management, so we want to store the images which have accepted, according to the field of speciality of the doctors. This would help in retrieving the images efficiently.
- Real-Time Verification : We aim to take our software and the security a level higher. We plan to do so by verifying the profile image uploaded by the doctor with a real time image captured from their phone/laptop camera, which will ensure the proper verification of doctor.

## Risks/ Challenges

- One of the biggest challenges we face would be to distinguish a face from the background, if the image is not clicked in well-lit conditions. As we convert the image into grayscale to run the LaPlace variance and LAB value, the dim-lit images would have the face merging with the backgrounds, resulting in failure.
- Another big challenge would be to recognize the face in picture where people have unusual facial expressions. In photos where people are keeping poses beyond the ordinary, the detection of the facial landmarks may get inaccurate.





A stylized illustration of a team of seven people working together to build a rocket. The scene is framed within a large, rounded rectangle that resembles a laptop screen. The rocket is white with a red nose cone and is positioned in the center. Several team members are on ladders of different heights, working on the rocket's structure. One person is at the top, another is on a ladder to the left holding a gear, and others are on ladders to the right and at the base. The background is a light green hill with white clouds. The overall theme is teamwork and achievement.

# Thank You

Team **SEN**