Glasses for visually Impaired

**Tell us what your idea is.**

An inexpensive, easy to use product is made which can be operated via voice commands. Real-time input is taken from a mobile camera. This data is transferred to a mobile phone application. Object detection, optical character recognition, and facial recognition algorithms are applied to process the data. Finally, instructions or text is read out to the user.

Once the app is opened user can tell whether they want to access the object detection or the optical character recognition module or facial recognition. In the object detection module, the user is told if there is an object in front of them and what kind of object it is and how far the object is, where should a person move if there is an obstacle near them. Using this module and with map API the user would be able to reach the destination without anyone assistance. For the object detection module, on the mobile screen, the accuracy with which the object is recognized is displayed.

For the optical character recognition module, text in front of the camera will be read out to the user. This module will help the user to read books or different stuff. I want to make this an app fully interactive app, so all the interaction between the user and app will be done using voice commands

For facial recognition, If a user is in a meeting or in a gathering he would be able to recognize the person. For this, I will add or train the model for specific people. Or the user will also be able to train the model by uploading the picture and assigning the name to it.

**Tell us how you plan on bringing it to life.**

Right now I have used Google Speech Recognition API. and MobileNet SSD v1 TensorFlow lite model for object detection and I have integrated both modules. I am using Object detection for the navigation of the visually impaired person.

I want to integrate Optical Character recognition in this app as well for reading purposes.

To switch between modules I am using voice commands. If a person says open object detection or something similar to that, the object detection module will be opened and the module will start detecting the object and text to speech module will start returning the speech and the user will be able to listen that if there is a person, car in front of him.

I also want to integrate some distance measurement for the object which will be used to tell the user how far the detected object is. I also want to implement the optical difference of the camera to improve accuracy. Once the app is opened user can tell whether they want to access the object detection or the optical character recognition module. In the object detection module, the user is told if there is an object in front of them and what kind of object it is. On the mobile screen, the accuracy with which the object is recognized is displayed. If a user says reading or open optical character recognition, the app will start reading the book or anything a user wants to read and that thing must be placed in front of the mobile camera.

Similarly, I also want to implement facial recognition in the app. That will help the person recognizes people in a meeting or a gathering.

### **Technologies:**

These ML technologies like object detection, optical character recognition, and facial recognition will be used to bring the concept to life. I have a sample of code for object detection integration with text to speech and speech recognition.

Google can help me guiding and giving me a more realistic direction about how to achieve my idea using Google technologies. Google would be able to prioritize the requirements. And they might help with finance if required at any stage of the project. They can help to refine my idea if required

### **By the end of December:**

I will be able to integrate multi-threading for the voice commands. So that the user would be able to switch between modules like if the object detector is running by giving some commands object detector will be stopped and the optical character recognition module will start. I will also implement a distance measurement algorithm for the detected objects.

### **By January - February:**

I will be able to develop and integrate the optical character recognition in the app for real-time input. This will help the user to read different things like newspapers, books or any other reading material.

### **By the end of March:**

I will be able to develop and integrate facial recognition in the app. This module will be used to recognize the people when the user will be in some gathering or meeting.

### **By the end of April:**

I will try to improve the accuracy of the module and will try to remove the bugs and errors from the app. This month, I will take out the complete testing of the application.

### **Prioritize of modules:**

Firstly I will try to integrate only three modules in the app just to make sure the app doesn’t take much space. Those three modules will be my priority and these modules are speech recognition, object detection, and optical character recognition.

After that, I will add a facial recognition module and integrate it with the app.

**Tell us about you.**

This is Agha Saad Fraz, I am in my Final year and pursuing Software Engineering from National University of Sciences and Technology. I am Intending to get a quality education, and experience to get into a reputed software company to achieve new levels of competence where my innovative ideas and skills are being utilized as well as enhanced.

I aspire to be a social entrepreneur in the near future. I have special interests in Sustainable development Goals and believe in innovation for purpose or impact. I feel the AndroidDev challenge would be a big leap towards my future prospects, It would connect me with like-minded individuals.

I am particularly enthusiastic about health and its repercussions. I along with my team earlier made a website to build a communication channel among the Doctors, patients, and pharmacies to share each other’s problems and solutions. You can see the website [here](https://hireadoctor.000webhostapp.com/htmls/Team.php).

I have done a bunch of projects as I work as a freelancer as well. I have developed a Music app for android. I have developed Bots for Instagram, eBay. I have developed web scrappers for different websites. I have also done Image classification using CALTECH-256