



# ADVANCED BLIND HELPER APP

<sup>1</sup>Dr. C. Prema, <sup>2</sup>S. Bharathraj, <sup>3</sup>J. JohnStephen, <sup>4</sup>P. KishorSanthosh, <sup>5</sup>S. Raja

<sup>1</sup>Faculty, <sup>2,3,4,5</sup>UGScholar

Computer Science and Engineering

Jayaraj Annappackiam CSI College of Engineering, Nazareth, India.

## Abstract:

Visually impaired people face a lot of challenges in their life and are at a disadvantage in our society especially the ones who live independently and doesn't have a dependent to take care of the needs. Technology is shaping the future and changing how people live. Technology has the potential to help people partially overcome some of these difficulties. Their lives can be made easier by voice-based mobile applications where the users can instruct the application to perform certain functions without actually seeing the application

**Index Terms - Object detection , Currency Detection, Message Reading, ML**

## I. INTRODUCTION

This project was conceived keeping in mind the day-to-day struggles such *Voice calling, Object detection, Reminder, Currency detection, Message reading* etc. faced by blind and visually impaired people. So, for that, I have used google speech input where the blind user has to say certain words to open those particular tasks. This application has simple working a user has either swipe right or left on the screen to open the voice assistant and talk. I have also added a text-to-speech method for listening to the working and use of applications. It is developed to help blind people interact with others with ease. It Provides the blind user the ability to perform some basic daily activities with the combination of some mere touches and taps, such as calling, object detection, currency recognition, Reminder, Reading messages. The project is designed to address the daily struggles of blind and visually impaired people such as reading, for that I have used Google Speech Input where the blind user has to say a few words to open those specific functions. This application has a simple function as the user swipes right or left on the screen to open and speak to the voice assistant. I've also added a text-to-speech method to listen to the application's functionality and usage.

## II. LITERATURE REVIEW

Visually impaired people face a lot of challenges in their life and are at a disadvantage in our society especially the ones who live independently and doesn't have a dependent to take care of their needs. Technology is shaping the future and changing how people live. Technology has the potential to help people partially overcome some of these difficulties. Their lives can be made easier by voice-based mobile applications where the users can instruct the application to perform certain functions without actually seeing the application. This paper aims to design and develop a mobile application for visually impaired to help them do the most necessary tasks daily- life demands like voice assistant to read out SMS sent to phone, send mails using a voice assistant, scan any text using device's camera to read (textbook, newspaper, documents, food menu, street address, etc), scan currency note using device's camera and get its denomination, maintain a diary to store important information by dictating to the voice assistant which can then be read out when needed . Our mobile application, blind assist is not just intended to serve visually impaired but also old people who experience problems due to vision.

### III. RESEARCH METHODOLOGY

First I have added the required dependencies that allow us to include external library or local jar files or other library modules in our Android project. Then in the XML, I designed the user interface of the application. In Main Activity java, I have created all the methods that will help the user to open certain tasks with simple voice commands. We have also implemented a swiping touch event as given in that we have left and right swipes. By left-swiping, on the screen, the user will read the feature or operations of the app. By right-swiping on the screen voice input will start. After the user gives the voice command it will automatically be redirected to that particular activity. Let's say If the user says "read message" then it will automatically open the message activity. And app will start reading the message. Methods Used Text to Speech (TTS) TTS is a method that converts speech from text. TTS is important for voice output for voice feedback for users. TTS is implemented in software where audio capability is required. When a user enters a voice command, TTS will convert that voice into text format and perform a specific action. Speech to Text (STT) Android has an inbuilt feature that is speech-to-text through which users can provide speech input to the software. In the background, speech input will be converted to text and performed the action in the form of TTS.

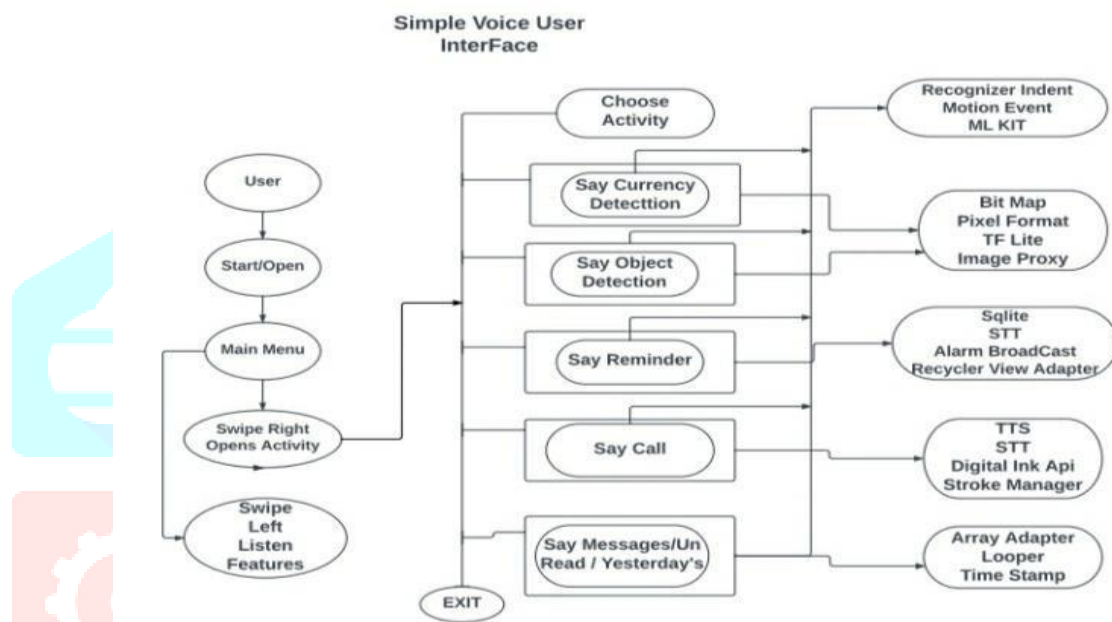


Fig.1 Architecture Diagram

### 3.1 Algorithm

#### 3.1.1 Naïve Method algorithm

Naïve method is a basic algorithm to solve any problem. In this method, the maximum and minimum number of arrays can be found separately. so we will get maximum position array to get results for classification of image based on RGB values.

##### 3.1.1.1 Code implementation

```

ModelUnquant.Outputs outputs = model.process(inputFeature0);
TensorBuffer outputFeature0 = outputs.getOutputFeature0AsTensorBuffer();
  
```

```

float[] confidences = outputFeature0.getFloatArray();
//find the index of the class with the biggest confidence.
int maxPos = 0;
float maxConfidence = 0;
for(int i = 0; i < confidences.length; i++){
    if(confidences[i] > maxConfidence){
        maxConfidence = confidences[i];
        maxPos = i;
    }
}
  
```

### 3.1.2 Y'UV444 to RGB888 conversion algorithm

- In imageUtils.java file we have used Y'UV444 to RGB888 conversion algorithm,
- The function  $[R, G, B] = Y'UV444toRGB888(Y', U, V)$  converts Y'UV format to simple RGB format.
- The RGB conversion formulae used for Y'UV444 format are also applicable to the standard NTSC TV transmission format of YUV420 (or YUV422 for that matter). For YUV420, since each U or V sample is used to represent 4 Y samples that form a square,
- YUV color-spaces are a more efficient coding and reduce the bandwidth more than RGB capture can

### 3.1.3 Matrix Transformation Algorithm

- A transformation matrix **allows to alter the default coordinate system and map the original coordinates (x, y) to this new coordinate system:** (x', y'). Depending on how we alter the coordinate system we effectively rotate, scale, move (translate) or shear the image this way.
- To apply the rotation of image to get better results.

## 3.1 MODULE DESCRIPTION

**3.2.1 Voice calling:** After swiping right on the screen the user has to say "*call*" then user redirect to caller activity. Then user either say the phone number or write the phone number on screen for calling.

**3.2.2 Currency Detection:** If user wants to know the value of currency then user can capture the note using camera and app will tell the values of currency.

**3.2.3 Object Detection:** To detect the object and recognize the name of the object. Specially designed for blind

**3.2.3 Message Reader:** In this activity, user can listen inbox messages. Basically it has 2 methods.

- User can say "read message" to read today's message.
- User can say "yesterday message" to read yesterday message.

**3.2.4 Reminder:** Voice reminder is specially designed for blind. It takes time date and task as input and set the alarm and notify the user using notification whether app runs in background.

## IV. RESULTS AND CONCLUSION

At present, mobile apps on smart phones are used to perform most of our daily activities. But the people with vision impairment require assistance to access these mobile apps through hand held devices like mobile and tablets. Google, Android applications has been developing various mobile apps for visually impaired people. Still it needs to provide more effective facilities in app by adopting and synergizing suitable techniques from Artificial Intelligence. This App introduced two environmentally-friendly designs for a blind people. We presented information about the Blind people application. This application will be more effective for blind people. It is important to develop this application for the future. The system is used by Blind people but normal people also can use it.

4.1 Sample Screenshots

Figures 2 to 15 represents the sample screenshots



Fig.2 Home page

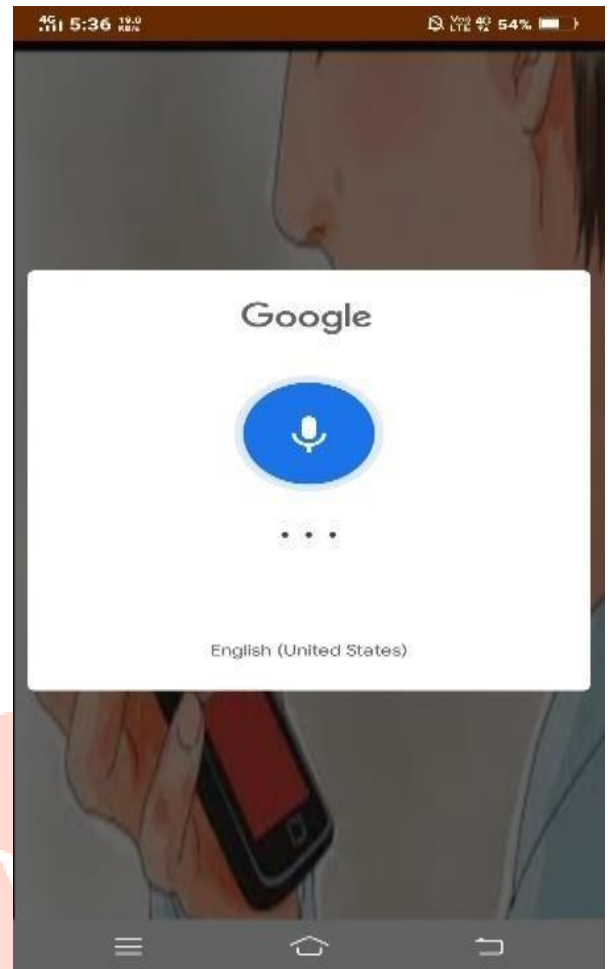


Fig.3 Right Swipe

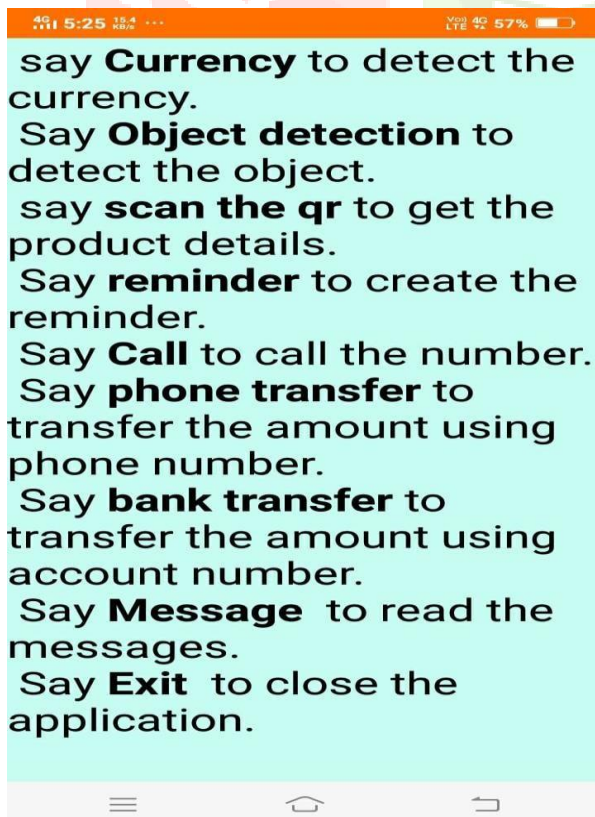


Fig.4 Left Swipe

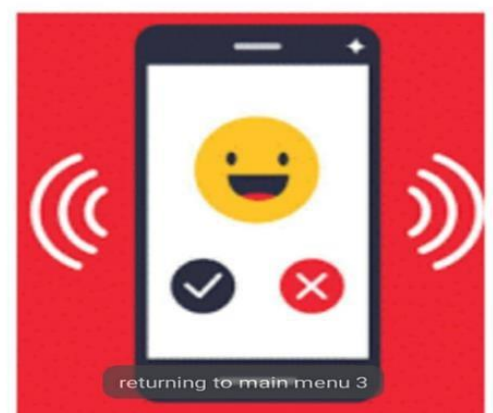


Fig.5 Calling

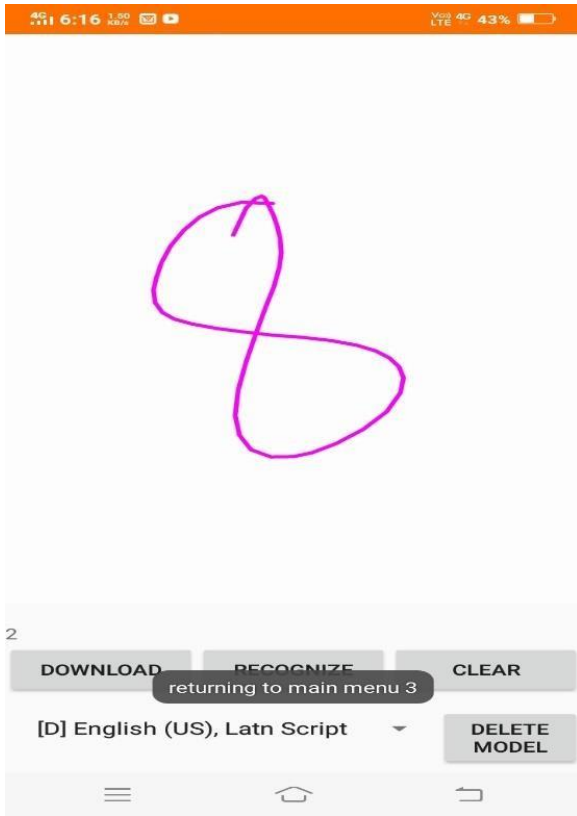


Fig.6 calling (write to Access)



Fig.7 Currency Detection



Fig.8 Object Detection

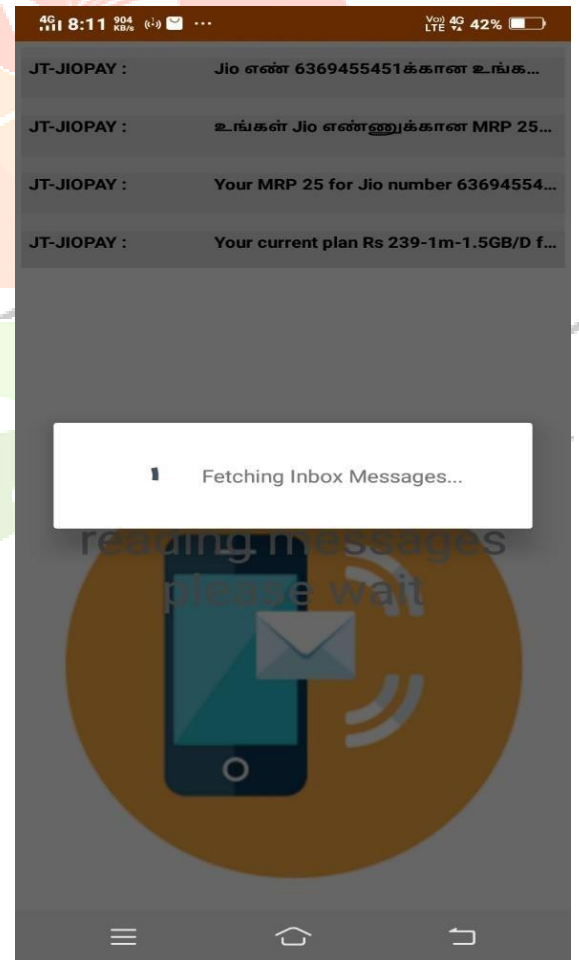


Fig.9 Message reading



Fig.10 Message reading

## V. FUTURE ENHANCEMENT

Advanced Blind Helper app is help blind person to find the currency detection , object detection, calling, message and remind the work. It will provide an instant as well as accurate response. For future enhancement, some more feature are introduce QR code Scanners like Money Transfer in mobile phone etc.

## VI. ACKNOWLEDGMENT

We would like to acknowledge our sincere thanks to the Management to four College and our family members who have supported and helped us in different stages of this project work.

## REFERENCES

1. una Al-Razgan, Sarah Almoaiqel, Nuha . A review on finding date, time and location: (2020). <https://ieeexplore.ieee.org/document/9545700>
2. Samruddhi Khamgaonkar, Nikita Warkar, Arpita. A review of navigations to the blind peoples:r (2019). <https://ieeexplore.ieee.org/document/7259447>
3. Kun Xia; Xueyong Li; Haiyang Liu. A review on wearables to assist virtually impaired(2022) . <https://ieeexplore.ieee.org/document/9837057>
4. Azin S. Janani, Sasan Ahdi , Rezaeieh. A review on the detection of liver problems: (2022). <https://ieeexplore.ieee.org/document/9893309>
5. Shreya P; Shreyas N; Pushya D; Uma Maheswar . Mobile application to read sms sent, sending mails through voice assistant (2021). <https://ieeexplore.ieee.org/document/9686476>
6. K. R. S. Al-Kiyumi; N. A. S. Al-Tourshi; F. M. S. Al-Muqbali; F. Hajamohideen. A review on finding color, object and faces(2020). <https://ieeexplore.ieee.org/document/9545700>
7. Siqi Zhang,Bo You, Xun Lang. A review on finding the stress of visually impaired peoples (2021). <https://ieeexplore.ieee.org/document/9548280>
8. SudhanshArya;YeonHoChung. A review on finding the neighbouring peoples (2020). <https://ieeexplore.ieee.org/document/8964327>
9. Gemma Carolina Bettelani; Giuseppe Averta. A review to develop Braille devices(2020). <https://ieeexplore.ieee.org/document/8977385>