Blind Assist Using the Voice and Camera Assistant Android App for Visually Impaired Person

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***Abstract*-As far as outdoor activities are concerned the blind face difficulties in safe and independent mobility depriving them of normal professional and social life. Also, there are issues of communication and access to information. This project is for the visually impaired people and is based on the android platform. The major module of the project scans and detects the object in the image captured by the camera of an in-built camera of a smartphone for the visually impaired. It is a dedicated image recognition application running on an Android system smartphone. Now-a-days, the mobile phone is one of the most powerful entities in the world, it helps for communication and to ease our day-to-day tasks. This android application integrates accessibility with navigation and features for safety of the user. The main aim is to guide visually impaired people to travel from source to destination. The user gives input vocally and he is guided through audio commands. We have included features like image recognition, making it easier for the visually impaired to identify the object around them. The app also includes news readers, therefore eliminating the issue of access to information. The user can get to know the day to day news which the app will read out for them. Adding to this, the app also helps the user to set alarms as well as remainders.**

I. INTRODUCTION

Android software development is the process by which new applications are created for devices running the Android operating system. Google states that "Android apps can be written using Kotlin, Java, and C++ languages" using the Android software development kit (SDK), while using other languages is also possible. All non-JVM languages, such as Go, JavaScript, C, C++ or assembly, need the help of JVM language code, that may be supplied by tools, likely with restricted API support. Some programming languages and tools allow cross-platform app support (i.e. for both Android and iOS). Third party tools, development environments, and language support have also continued to evolve and expand since the initial SDK was released in 2008. In addition, with major business entities like Walmart, Amazon, and Bank of America eyeing to engage and sell through mobiles, mobile application development is witnessing a transformation. The android application is to help the partially blind carry out their day-to-day duties in an easier fashion. The Smartphone technologies and mobile applications make it easier, helping us carry out our day to day activities. As far as these activities are concerned the blind face difficulties in safe and independent mobility depriving them of normal professional and social life. They also face issues such as communication and access to information. The ability to navigate from one place to another is an integral part of daily life for this vision plays a critical role but it would be difficult for visually impaired people. Although it would be easier to go to a familiar environment without vision, navigating to unfamiliar places without vision is very difficult. In spite of this, the visually challenged people travel to different places independently on a daily Basis.

II. RELATED WORKS

Now-a-days, the mobile phone is one of the most powerful entities in the world, it helps for communication and to ease our day-to-day tasks. This android application integrates accessibility with navigation and features for safety of the user. The main aim is to guide visually impaired people to travel from source to destination. The user gives input vocally and he is guided through audio commands. We have included features like image recognition, making it easier for the visually impaired to identify the object around them. The app also includes news readers,

therefore eliminating the issue of access to information. The user can get to know the day to day news which the app will read out for them. Adding to this, the app also helps the user to set alarms as well as remainders.

III. THE PROPOSED SYSTEM

1. Our aim is to develop an application that will help the blind carry day-to-day duties in easier fashion.
2. The main motive of this app is to make it easier for the user to learn the objects around them using image recognition.
3. Help them navigate to the required place.
4. Read the news for them, making it easier for them to update with the day to day news.
5. Help them set the alarm and remainders.

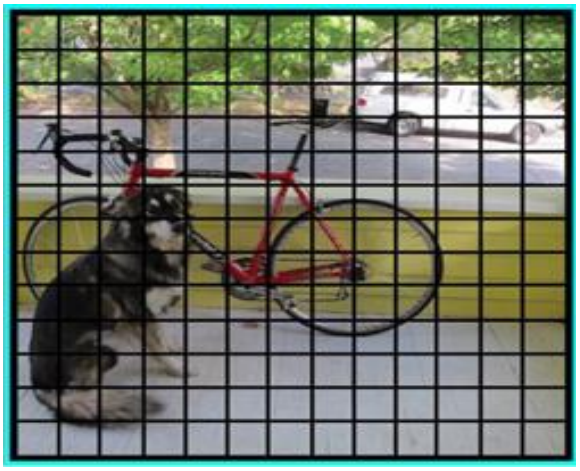
IV. THE EXISTING SYSTEM

The World Health Organization and the International Agency for the Prevention of Blindness's Vision 2020 initiative states a goal of "eliminating avoidable blindness by 2020." We are looking to do part in completing the aforementioned goal. Blind-Not is a powerfly tool looking to eliminate, on the contrary, initiate a process which helps the blind to carry out their everyday duties in a more efficient manner. The Initial software will be built on the Android platform. We are looking to include numerous modules such as Google API's, Firebase to store user data, Python Libraries, Machine Learning etc. TapTapSee is an app designed to help the blind and visually impaired identify objects they encounter in their daily lives. The user has to simply double tap the screen to take the photo of anything around them at any angle and hear the app speak the identification back. However, this app had little trouble identifying currency. Therefore, in our project we have implemented image recognition using TensorFlow, such that it identifies various objects including currency. Another application which is part of Google's android accessibility service, is designed to help the visually impaired users with just using their mobile devices. The app monitors and speaks out every movement the user makes on his or her phone. It can also read out the texts for them.
iSee is an android based application that benefits from commercially available technology to help the visually impaired people to improve their day-to-day activities. In this app, the user has to just hold the point and point anywhere he/she desires and tap on the screen. The application's algorithm runs in the background, and then communicates audibly, via a voice message, the object type, name and description. Therefore, our aim was to combine all these features together and implement in a single android application. Thereby making it easier for the visually impaired.

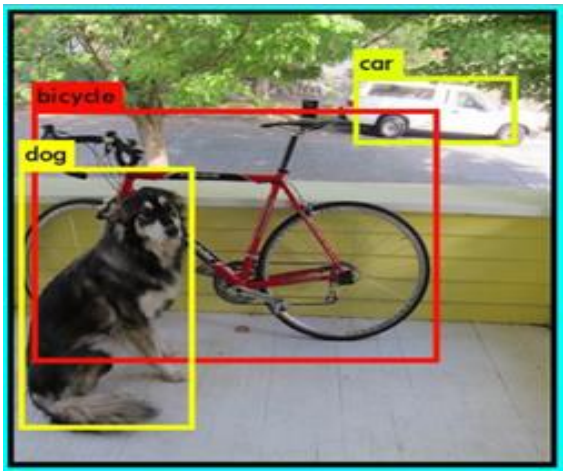
Disadvantages of Existing System
1. Although the coder designs an optimised code, the code readability is very inadequate and cannot be modified by the user even if required. Any change to the code requires change in the model itself.
2. The amount of complexity and requirement requested by the code has led to the reduced usage of this application and manual code conversion is preferred.

V. SYSTEM ARCHITECTURES

A General Framework for Object Detection:
Typically, we follow three steps when building an object detection framework:
1. First, a deep learning model or algorithm is used to generate a large set of bounding boxes spanning the full image (that is, an object localization component).



2. Next, visual features are extracted for each of the bounding boxes. They are evaluated and it is determined whether and which objects are present in the boxes based on visual features (i.e. an object classification component).



VI. RESEARCH METHODOLOGIES

Image Recognition Module
This module is implemented using TensorFlow. Image recognition helps identify the objects by taking the picture using the phone's camera. The user is supposed to just take the snapshot and the app would label the objects identified in the picture.

Navigation Module
Aim is to guide the visually impaired to travel from source to destination. The user can pin a location on the map. And then he or she is guided through the audio commands. This module is implemented using Google API.

News Reader Module
This module is voice activated. Reads every day's headlines, so that they can get updated to day to day news. Built from RSS news feed and fed into the application. It is real time based and updates fast. According to an excerpt by Mr. Paul Adam on Quora, one of the primary difficulties for the blind using an application are the numerous buttons and forms which are not labelled. These issues tend to be on the rise in most applications dedicated to the blind. Blind-Not will normalize these issues and turn to a user-friendly environment. In conclusion, Blind-Not, although, might not be the end goal but is definitely a step towards that goal.

TensorFlow Object Detection
The TensorFlow object detection API is the framework for creating a deep learning network that solves object detection problems. There are already pretrained models in their framework which they refer to as Model Zoo. This includes a collection of pretrained models trained on the COCO dataset, the KITTI dataset, and the Open Images Dataset. These models can be used for inference if we are interested in categories only in this dataset.

Rapid application development method
This method is directed by producing high quality system in most efficient time costs. Also, it allows to divide project into smaller parts and develop them separately. It's basic idea to produce high quality system quickly by use of interactive Prototyping. It emphasizes on satisfaction the business requirements. It sets strict deadlines and if project slips the schedule, the emphasis is set to reducing requirements and not on changing deadlines. The prototypes are giving to the user for evaluation.

VII. CONCLUSION

We have presented an Android application for the assistance of the visually challenged user that will guide the user in navigating from his source to destination as well as it will help him in acknowledging his contacts about his location. The app was developed and Google Maps were integrated to search different locations on map. SMS sending module is integrated to the app, on triggering SMS button SMS to registered users is sent with the user's current location. The application requires internet connectivity and GPS enabled smart-phone and thus can be easily accessed by the user. Thus, the developed application is more accurate than the existing systems. The use of the application will surely ease some of the difficulties faced by visually challenged users and can help them in achieving an independent livelihood.

VIII. FUTURE ENHANCEMENTS

The government is set to change a four-decade-old definition of blindness to bring it in line with the WHO criteria and ensure the Indian data on blindness meets the global estimates. The change in definition will bring down the number of blind persons by 4 million in India by 2020. We are looking to be part of that goal and do our part for the society.

IX. REFERENCES

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