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Object Recognition and Voice Output with Android Smartphone

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ABSTRACT: This paper gives different essential information about features of software modules built for android framework for visually impaired users. The object recognition encourages visually impaired users to perceive different objects around his/her environment. A methodology is implemented to recognize different objects from a picture on android stage. Caught picture, with use of Android smartphone, is fed to system to extract the objects, for example car, bird, person and so forth. Then the detected objects can be informed to visually impaired person with voice output using a module, which convert a text input to voice/speech.

KEYWORDS: Android Smartphone, Object recognition, visually impairments, Speech Output.

I. INTRODUCTION

In everyday continuous life, everything is getting subject to computer based advance technologies. Due to which, a large number of the challenges is been advanced in these technologies. Processing power is getting even closer towards Human Computer Cooperation plans. To the extent, outer environment is considered unsafe for the visually impaired person. As they faces trouble commuting, denying them of regular qualified and societal life. As we realize that, the visually impaired user is constantly on edge to know what is happening in his/her environment, so a huge help is given by the android application with discourse yield to the visually impaired user.

Using a cutting edge advanced smartphone has favourable position that they give a wide scope of administrations such as advanced camera, voice recognizer, and so forth. By The Statcounter website's analysis, the Android platform has gained 75% share of total smart phone market [1]. As of late, the most smartphones being utilized are Android and iPhone, as iOS would be an expensive methodology for this framework, so the fundamental usage are made on Android framework.

II. RELATED WORK

Most of the systems that delivers the proposed work needs an active and reliable internet connection. Which can be a major drawback for system, as there could a connection failure anytime during the use of application in real-world environment.

The EyeRing project comprises of a VGA camera, AVR microcontroller, a Bluetooth module with control keys. This is a finger-worn gadget, coupled with an Android advanced mobile phone. This arrangement, in any case, is costly for the visually impaired users. As, this task is outfitted with a significant number of the instruments, makes this task complex to convey for a visually impaired user.

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LookTel is a business application on iOS platform that should recognize an object inside the camera limit see that was recently added in a local database of objects. The application is built to help visually impaired person to detect household objects. For solid outcomes, objects put away in the picture ought to be caught by a sighted individual. However, the picture is taken by a sighted individual could be a downside. Because each time the visually impaired user must rely on a sighted person.

III. PROPOSED SYSTEM

Our prototype application works on android 6 or higher. It mainly utilizes camera to detect objects. So, while using the application for the first time, user need to give access to the camera system of the device. The application does not need internet connection for now. To achieve this goal I have used state of the art object detection system- YOLO.

How it works?

This system is very easy to use. User does not have to interact with the application except when he needs to know what is in front (in Camera's Field View).

1. User have to open the app and point the camera towards the direction where he/she wants to detect objects.

2. After pointing the device, user just have to tap on screen, which will activate a TextToSpeech service. This service will provide a voice output of the objects name, which has been detected by our system.

Here are some pictures of working model of the proposed Android application

Fig 1. The smartphone has detected 'tvmonitor' is in the view of camera.

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Fig 2. The smartphone has detected 'person' is in the view of camera.

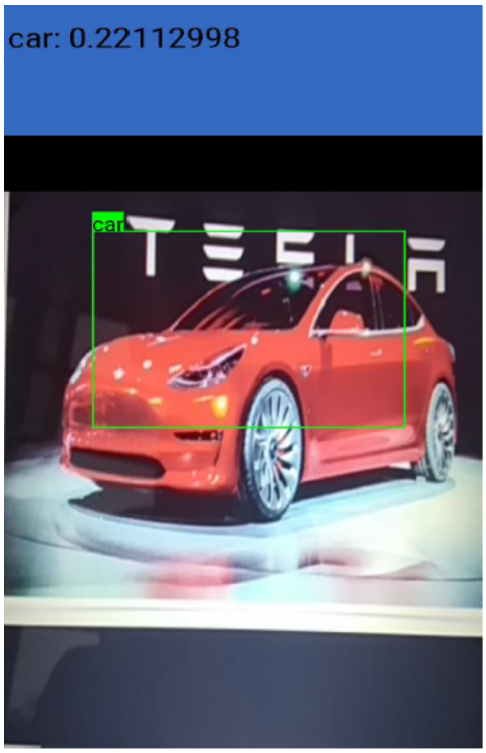

Fig 3. The smartphone has detected 'car' is in the view of camera.

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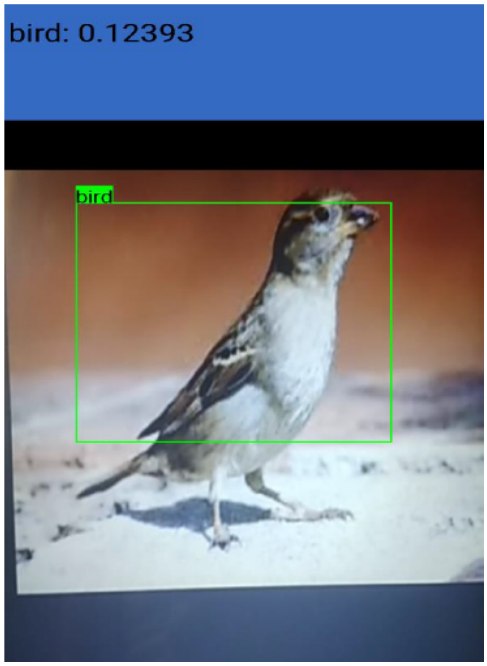

Fig 4. The smartphone has detected 'bird' is in the view of camera.

IV. FUTURE ENHANCEMENTS

This application is only a prototype. We can add various functionalities, which can revolutionize the way we use technology.

- The application can be built for all mobile platforms.
- We can add more household objects in system with manual training of a model to detect those objects.
- We can add depth sensor and programming module to decide a threshold depth value until which the objects should be detected.
- Further, we can add is a Guidance system. This system can provide a real-time path guidance to user.
- We can track the way human interacts and provide a user the relevant data.
- To provide visually impaired person more freedom, we can built an entire new system using IoT devices. Which can eliminate the use of a smartphone. This way, we can provide better solutions and improve functionality.

V. CONCLUSION

The application that I am attempting to create will propel the method for individuals that are going to utilize the advanced technologies. The application created would prompt a superior arrangement for correspondence and day by day living for visually impaired person. It would be a new methodology in the registering condition, and will prompt a fruitful and dependable methodology. As, I am utilizing all Android based integrations, which is absolutely an open source, due to which, the application will be an open source thus it can be utilized by each visually impaired person.

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