

Real- Time Object Detection for Blind People

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Abstract: *Object detection and warning can improve the mobility as well as the safety of visually impaired people specially in unfamiliar environments. For this, firstly, objects are detected and localized and then the information of the objects will be sent to the visually impaired people by using different modalities such as voice. In this paper, we present an assistive system for visually impaired people based on TensorFlow object detection model and Google Speech's model. This system consists of two main factors: environment information acquisition and analysis and information representation. The first element aims at capturing the environment by using TensorFlow object detection model and analyzing it in an order to detect the predefined objects for visually impaired people, while the second element tries to represent object's information under the form of a speech to visually disabled person.*

Keywords: Object detection, TensorFlow, modalities, Vision defects, Google Speech's model

I. INTRODUCTION

Visual impairment can limit people's capability to perform everyday tasks and can affect their quality of life and capability to interact with the girding world. Blindness, the most severe form of visual impairment, can reduce people's capability to perform diurnal tasks, and move about unaided. Good quality recuperation allows people with different degrees of visual impairment to completely benefit from life, achieve their pretensions and be active and productive in moment's society. Ample sweats have been made to prop the eyeless by instituting and perfecting technologies. By the preface of an introductory detector, the vittles to the aid of eyeless people have remarkably increased. Numerous universities and companies like IBM have given a part of their focus to the development of aids for the eyeless people. Some of the popular bones are smart nightsticks and object detectors. Recent development includes tone-driving buses and smart spectacles. In the last 30 times, colorful other strides that have been developed are the textbook or speech software's and smartphone apps. Also, the systems that are being developed on robotics and artificial intelligence will be veritably profitable to them as well.

One of the major factors in developing these specialized aids is the comity with the stoner. He shouldn't have trouble getting acquainted with the product. The features of the product shouldn't be too delicate to use. Indeed, the announcement systems used to warn the redoubt should be comfortable and dependable. Another major factor is the cost of similar products. Since they're formerly paying for treatments or other nursing cares, the price of the product should be in the range that's reasonable. Other point of these products should be the continuity. The druggies might not be suitable to charge the system. Thus, applicable measures should be taken consequently.

II. LITERATURE REVIEW

A real-time inner and out-of-door object recognition system for guiding people who are eyeless. A multiple-scale system is suggested for speeding up processing. Large content area for business signal discovery. The experimental sections examine the scaling factor and the size of the image source, determining the stylish values for the template. The system was proposed by Rohini Bharti and Ketan Bhadane in 2019, and it had a confirmation delicacy of 90, and it stopped perfecting after 3000 duplications was observed in the model. They've trained our model for the following classes Monitor, Train, Sofa, Plant, Person, Motorbike, Dog, Tables, Auto, Cat, Bird, Bicycle, Bottle, Chair, Aircraft. Abdul Muhsin, 2019[7] proposes the work enforced using python and when run gives an accurate decision for object discovery and bracket, while DNN tend to give good delicacy, but the problem is with its family of networks regarding

speed, it handed veritably slow results for 5 FPS on a GPU. Anush Goel, 2018[8] propose a system to gain textbook regions from cutting - edge backgrounds, they've come up with unique textbook localization formula which works on models of edge distributions and stroke exposure. Mugdha Surve, 2016[9] The proposed system helps to increase the mobility of eyeless person. Problems related to business signal discovery and identification have been overcome using videotape sluice in Matlab. Hanen Jabnoun 2016[10] We conclude from given paper that visual volition system is handed for eyeless person on base of object discovery and its identification in videotape scene. Operation of SIFTS crucial points derivate and features matching for object identification. Dr.B. Muthusenthil, 2018[11] developed a system to convert an image to speech using a jeer pi. Our model has entered the training to descry all common objects.

2.1 Object Detection

In sonar technology, sound propagations are used to navigate, communicate with or descry objects on or under the face of the water, similar as other vessels. This technology can be substantially divided into two types- unresistant and active. In unresistant sonar, when the vessels make sound, they hear to it. Active sonar is emitting beats of sounds and harkening for echoes. This is the medium we will be working with. This is primarily used for aural position shadowing.

Ultrasonic technology is always in exploration veritably deeply because of the vast different ideas it can harbor. Also, due to its technological improvements in colorful operations, the detector is incorporated more and more extensively. Some of the operations of ultrasonic detector are parking detectors, robot avoid object, position findings and its operations in the poisonous, dangerous and sharp surroundings. Ultrasonic detectors are veritably well-used for seeing operations in the areas of engineering, drugs and drug.

2.2 Tensor Flow

The TensorFlow Object Discovery API is an open - source frame erected on top of TensorFlow that makes it easy to construct, train and emplace object discovery models. There are formerly pre-trained models in their frame which are appertained to as Model Zoo. It includes a collection pre-trained models trained on colorful datasets similar as the COCO(Common Objects in Context) dataset, the KITTI dataset, and the Open Images Dataset. As you may see below there are colorful models available so what's different in these models. These colorful models have different armature and therefore give different rigor, but there's a trade-off between speed of prosecution and the delicacy in placing bounding boxes.

2.3 Text- to- Speech Conversion Technology

The literal and theoretical bases of contemporary high- performance textbook- to- speech(TTS) systems and their current design are bandied. The major rudiments of a TTS system are described, with particular reference to oral tract models. The stages involved in the process of converting textbook into speech parameters are examined, covering textbook normalization, word pronunciation, prosodies, phonetic rules, voice tables, and tackle perpetration. Exemplifications are drawn substantially from Berkeley Speech Technologies' personal textbook- to- speech system, T-T- S, but other approaches are indicated compactly.

III. EXISTING SYSTEM

When it comes to the daily lives of blind people, they often rely on the assistance of others. Without the help of someone, they face challenges in completing their day-to-day activities. For instance, while walking to a destination or crossing roads, visually impaired individuals encounter various objects such as walls, vehicles, trees, tables, and chairs. These objects pose potential harm to them, and therefore, they often require the help of others in many scenarios. The reliance on others can limit their independence and freedom, as they may need constant assistance for navigation and obstacle detection. This dependence on others can also impact their confidence and sense of autonomy in their daily lives. As a result, there is a need for innovative solutions that can empower blind individuals to navigate and detect objects independently, enhancing their overall quality of life.

3.1 Drawbacks:

- Increased interference from the public wanting to assist
- Cane travel can be more cumbersome and not as fluid. A cane gets stuck in cracks, and you get a poke in the stomach
- Weather negatively impacts cane travelers.
- Folded cane requires large area for storing or large bag for carrying while folded.

IV. PROPOSED SYSTEM

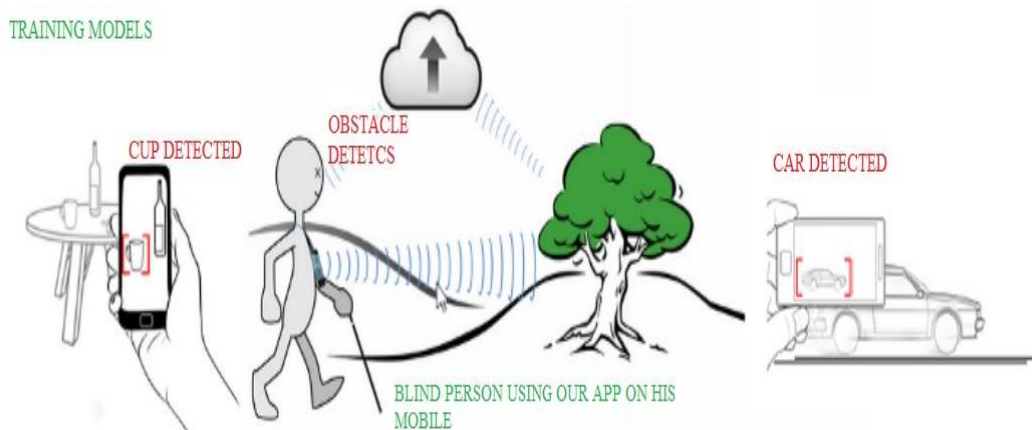
The project aims to develop an Android application for object detection to assist visually impaired individuals during their walk. The application detects objects in their path and provides auditory cues about the location and direction of objects to help them navigate safely. One of the challenges in object detection is accurately locating and separating objects from complex backgrounds. Traditional computer vision algorithms may struggle with this issue as handcrafted features are vulnerable in complex backgrounds. To address this, the article proposes the use of a deep convolutional neural network (CNN) for object detection. The deep architecture of the CNN allows for the extraction of rich and effective features for object detection. The results of the study demonstrate that the proposed model achieves good performance in detecting objects in complex scenes. This approach holds promise for improving the accuracy and effectiveness of object detection for visually impaired individuals, providing them with valuable information to navigate their surroundings safely.

4.1 Advantages

- Makes Independent
- It is safe and eco - friendly application.
- Saves time and helps them to achieve daily tasks.

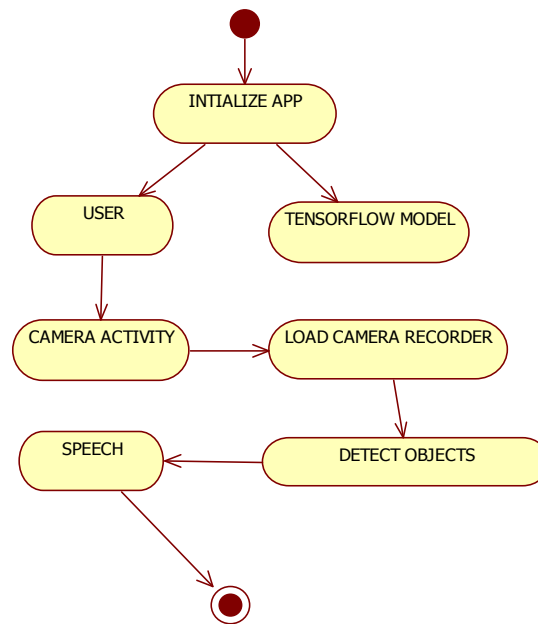
V. ARCHITECTURE

The flow for the project is given below:



5.1 Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.



VI. CONCLUSION AND FUTURE SCOPE

When it comes to the conclusion of our application, it is worth noting that it empowers users to independently identify objects in their environment and navigate around them without relying on assistance from others. The real-time object detection capabilities of our application enable users to quickly and accurately detect objects in their path, providing them with crucial information about their surroundings. This newfound independence can significantly enhance the mobility and safety of visually impaired individuals, particularly in unfamiliar environments where obstacles may be present.

Moreover, our application has the potential to incorporate additional features to further enhance its functionality. For instance, distance calculation between the user and objects can be integrated, allowing the application to provide distance-related information to the user. This could include the distance to the detected object, as well as the direction in which the object is located. This additional information can assist the user in making informed decisions about their movements and navigating their surroundings with increased confidence and accuracy.

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