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Third -Eye Aid for Blind

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Abstract -

Visually impaired people face lot of difficulties in their daily life. Many a times they rely on others for help. Several technologies for assistance of visually impaired people have been developed. Among the various technologies being utilized to assist the blind, Computer Vision based solutions are emerging as one of the most promising options due to their affordability and accessibility. Thus a solution for such people is proposed by an efficient technique like machine learning algorithm. In order to access machine learning technique, the necessary data input are obtained using a technique called Image Classification. The proposed system captured as images using camera and then converted into audio signals for assisting blind People. Raspberry Pi 3B+ is used to implement artificial vision using python language on the Open CV platform.

Keyword- Blind assistant, Image to audio conversion, Machine Learning, YOLO V3, Python.

I. INTRODUCTION

BLINDNESS is a problem that plagues millions of people everywhere. Blind people face many types of hurdles in performing every day routine works. Even in their own homes they must exhibit efforts to navigate from one place to another and to locate objects. According to the World Health Organization (WHO), 253 million people live with visual impairment, 36 million of which are blind and 217 million people have moderate to severe vision impairment. The conventional methods adopted like cane helps in avoiding the obstacles in their way but they do not help them identify and locate the objects. Hence, assistance is required for the blind that helps him/her in locating objects in an indoor environment.

In this research work we focus on how to help blind people. For this we use well known technology of image processing and computer vision that focuses on detecting objects in computerized pictures. Object detection can be used for a variety of purposes, such as recovery and surveillance. Other essential concepts used in object detection, like using the OpenCV library of python 2.7 progressing in the exactness and effectiveness of object detection, are displayed. For assisting blind people, we use YOLO V3 algorithm which can detect object based on deep neural networks to make precise detection. We also use open CV under python using raspberry pi 3B+.

The dataset has seven features. In this work I have try to prepare four models to detect object and signboard to help visually impaired person to manage their everyday activities. This model will assist blind people by giving speech command to detect items using image processing technique and provide audio output to help to navigate barriers around them.

II. RELATED WORK

To overcome the travelling difficulty for the visually impaired group, this paper presents a novel ETA (Electronic Travel Aids)-smart guiding device in the shape of a pair of eyeglasses for giving this people guidance efficiently and safely.

In the last decades there has been a tremendous increase in demand for Assistive Technologies (AT) useful to overcome functional limitations of individuals and to improve their quality of life [1]. To overcome "user need oriented" critical drawback, in this paper an original "task oriented" way to categorize the state of the art of the AT works has been introduced: it relies on the split of the final assistive goals into tasks that are then used as pointers to the works in literature in which each of them has been used as a component [2]. With the advances in vision sensors and computer vision, the design of wearable vision assistance system is promising. Typically, the performance of visual sensors is affected by a variety of complex factors in practice, resulting in a large number of noise and distortion. In this paper, we will creatively leverage image quality evaluation to select the captured images through vision sensors, which can ensure the input quality of scenes for the final identification system [3]. This work introduces a wearable system to provide situational awareness for blind and visually impaired people. The system includes a camera, an embedded computer and a haptic device to provide feedback when an obstacle is detected. The system uses techniques from computer vision and motion planning to (1) identify walkable space; (2) plan step-by-step a safe motion trajectory in the space, and (3) recognize and locate certain types of objects, for example the location of an empty chair. These descriptions are communicated to the person wearing the device through vibrations. We present results from user studies with low- and high-level tasks, including walking through a maze without collisions, locating a chair, and walking through a crowded environment while avoiding people [4]. Cane is a tool that used by blind people or someone who has visually impaired which is caused by an accident or an illness. Cane helps the blind people to check whether there are any obstacles around them. This research designed a prototype named Smart Guide Extension that can detect obstacles, holes and give information about eights wind direction using Arduino. The obstacles and holes module uses 2 PING Sensors, while the 8 direction of the wind information uses CMP compass sensor 511. All the information will be informed through the sound [5]. A Stereo Image Processing System for Visually Impaired is a system that includes a wearable computer, stereo cameras as vision sensor and stereo earphones, all mounted on a helmet. The image of the scene in front of visually handicapped is captured by the vision sensors. The captured images are processed to enhance the important features in the scene in front, for navigation assistance. In order to incorporate the distance information, stereo cameras are used. But, the system uses a stereo camera hence making the system complex and cost ineffective. Real-Time Visual Recognition with results converted to 3D Audio is a system which comprises of several modules. Video is captured with a portable camera device (Microsoft Kinect, or GoPro) on the client side, and is streamed to the server for real-time image recognition with existing object detection models [6]. This paper introduces a technique for automating the methodology of detecting and tracking objects utilizing colour feature and motion. Video Tracking is the methodology of finding a moving object over the long distance using a camera in this paper an algorithm is developed to track the real-time moving objects in different frames of a video using colour feature and motion [7]. This paper proposed an object detection system for the blind using deep learning technologies. Furthermore, a voice guidance technique is used to inform sight impaired persons as to the location of objects. The object recognition deep learning model utilizes the You Only Look Once(YOLO) algorithm and a voice announcement is synthesized using text-to speech (TTS) to make it easier for the blind to get information about objects. As a result, it implements an efficient object-detection system that helps the blind find objects in a specific space without help from others, and the system is analyzed through experiments to verify performance [8]. This project tries to transform the visual world into the audio world with the potential to inform blind people objects as well as their spatial locations. Objects detected from the scene are represented by their names and converted to speech. Their spatial locations are encoded into the 2-channel audio with the help of 3D binaural sound simulation [9]. In this paper we introduce a novel set of rotated Haar-

like features. These novel features significantly enrich the simple features of Viola et al. and can also be calculated efficiently. With these new rotated features our sample face detector shows off on average a 10% lower false alarm rate at a given hit rate. We also present a novel post optimization procedure for a given boosted cascade improving on average the false alarm rate further by 12.5% [10]. These systems intend to help by providing their user with some critical information about their environment using senses they can still use. In this paper, we discuss a system that uses existing technologies such as the Optical Character Recognition (OCR) and Text-to-Speech (TTS) available on an Android smartphone and use them to automatically identify and recognize texts and signs in the environment and help the users navigate. The proposed system uses a combination of computer vision and Internet connectivity on an Android smartphone not only to recognize signs, but also reconstruct sentences and convert them to speech. This paper discusses the design flow and the experimental results of the project [11]. This project focuses on the field of assistive devices for visual impairment people. It converts the visual data by image and video processing into an alternate rendering modality that will be appropriate for a blind user. The alternate modalities can be auditory, haptic, or a combination of both. Therefore, the use of artificial intelligence for modality conversion, from the visual modality to another [12].

III. CONCLUSION

Hence on above literature Survey we can help blind person using above methodology with mixture of machine learning and image processing that help blind people to detect obstacle in their path such as range notification system, path finder, real time localization system, ultrasonic electronic system and novel indoor system and they get motivation to blind people.

Also there is a scope to develop a different system which will be more efficient and reliable to blind people.

IV. REFERENCES

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