A Survey on Detection of Real Time Objects with Face Recognition and Navigation for Visually Impaired People (E-Suite)

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Abstract: **Everyday visually impaired people cannot move safely anywhere because they cannot understand the obstacles and as well as real time objects as normal people. In their daily life impaired people are struggling to be safe and protect themselves from different type of moving vehicles, assault and violation the dignity of people on a daily basis. The face recognition describes biometric technology that goes way beyond recognizing when a human face is present, and the face detection device is used to identify the presence of people's faces within digital images. The main purpose of the system is to assist the blind people.**

Keywords: **Image Processing, Machine Learning, Visually Impaired, Face Recognition.**

1. Introduction

The paper presented consists of a device to help visually impaired people in their daily life, rather than modifying old cane stick by interfacing sensors on it, we have presented a novel way using mobile device named E-suit. The device consists of ultrasonic sensors to detect obstacles as well as Arduino MP3 shield is used for voice navigation. It consists of Raspberry PI module and camera for the detection of real time object and face recognition of family and known ones. It also provides security to visually impaired person. Overall, the device improves reliability, safeness and better mobilization which almost meets the requirement of visually impaired people. The main purpose of this project is to make visually impaired people independent and confident with hands free cane.

2. Literature survey

Kentaro Iwatsuka [1] in the paper designed a guide dog system with character recognition ability. The main aim of this proposal is to guide and assist blind people. A guide dog helps a visually impaired person (VIP) to act accordingly to the surrounding environment. However, it cannot do complex task such as reading words. They had built a system that can recognize and read characters to support them. Generally, the character recognition systems segment is from the general background by using some information. This time, here the designed system focuses exclusively on recognition and reading a room number. Hence they used a method of character searching by template matching. The main drawback of this system is that without template matching, the device is not capable of recognizing the character. This system needs to be set within certain limits, because the distortion of the character is one of the causes, the rate of recognition is not sufficient beyond 50cm.

Selman Tosun [2] designed a system to overcome the problem faced by the VIP's in the modern crowded places. They face many hurdles in their daily life such as object detection. To overcome this problem this system is designed with an application to detect the Real Time Objects. This application helps the VIP's to detect the object by using two techniques, i.e. machine learning and image processing. The goal of this device is to develop a mobile programme that helps the people with visual disability to move accordingly to their distance .This device consist of camfind scanner .When we scan the objects by this camfind scanner it will detect the object with the help of LWC sense which works with barcode reading system and the name of the object is displayed on the screen of the device and it transfer the voice command system, using this the name is displayed on the device and the voice sent will be searched in web and detect the object. The main purpose of this system is to give information to the visually impaired people by sound and the objects detected at particular intervals is on mobile screen marked by rectangular pattern.

Peter A. Zientara [3] has designed a device for Shopping purpose which assist and address the problem faced by VIP's (Visually Impaired Peoples) in Shopping times and to provide them a more personally satisfying in shopping and store experience. They have developed a shopping assistance on a vision-based automatic device that is useful and helps the users to select the appropriate and desired items or objects from a typical grocery store shelf itself. The main drawback of this designed system is, it is helpful for VIP's only in the Shopping purpose and not in the transportation or recognizing the

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obstacles that are caused to them.

Laurino Britto Neto [4] designed a system targeted at aiding the blind and low-vision people for a real-time face recognition system. In this system they had used a Microsoft Kinetic Sensor as a wearable device, which performs the recognition and detection of face and it uses a temporal coherence along with a simple biometric procedure to generate a sound along in which it is associated with the identified person, virtualized at his/her estimated 3Dlocation. In this approached system they have used a variation of the K-nearest neighbour's algorithm over histogram of oriented gradient descriptors dimensionally reduced by principle component analysis. The drawback of this system is that, they have not introduced the de-blurring technique. The main limitation of Kinetic-based systems which is not suitable for outdoor environment.
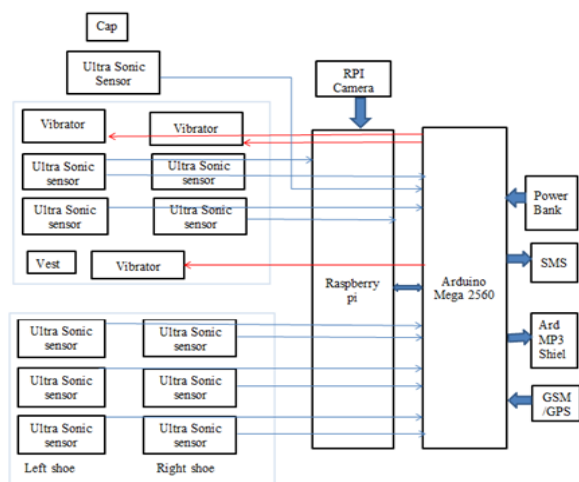
3. Block diagram

Fig. 1. Block diagram of E-Suite

In this proposed method, wearable smart electronic system used as aid for VIPs. The novelty of the system is providing awareness of obstacles that happens in their day to day transportation life. In addition, the system architecture provides improved efficiency compared to similar systems. Likewise, the system is endowed with different types of obstacle recognition, object recognition and facial recognition and also to direct the way to VIP's. In the present work it is been also presented an architecture for facial identification and spoofing detection oriented to people with visual disabilities.

4. Conclusion

The paper presented, consists of a device to help visually impaired people in their daily life, rather than modifying old cane stick by interfacing sensors on it. Here a new approach using mobile device named E-suit is used. The device consists of ultrasonic sensors to detect obstacles as well as Arduino MP3 shield is used for voice navigation. It consists of Raspberry PI module and camera for the detection of real time object and face recognition of one's family and known persons. It also provides security to visually impaired person. Overall, the device improves reliability, safeness and better mobilization which almost meets the requirement of visually impaired people. The main purpose of this project is to make visually impaired people independent and confident with hands free cane.

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