

SMART GUIDING GLASS FOR BLIND USING ULTRASONIC SENSOR

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Abstract: This device helps the blind to detect obstacles. We, propose a smart glass for visually impaired people to overcome traveling difficulties. This device is used to assist the blind to detect obstacles. This is sheltered and hearty direction support which helps many visually impaired people with no stress over any barrier on their moving way. Visually impaired people face lot of difficulty in today's world to go from one place to another. Our system focuses on helping them by providing the voice assistance based on the obstacles in their way. Also helps them to connect with the remote person for guidance in unfortunate situations. Remote person can see the video of happening in front of visually challenged person in remote as their eyes and guide them via phone. Our system is built by using ARM processor based raspberry pi board with camera and obstacle modules. Mobile application is developed for interacting with the raspberry board. Bluetooth and WiFi wireless communication is used for interfacing.

Index Terms - camera, raspberry bi, ultrasonic sensor, and GPS.

I. INTRODUCTION

About 285 million folks area unit visually impaired worldwide; thirty seven million of them area unit blind. Throughout the planet, most of the people with impairment area unit age fifty or older. concerning ninetieth of the world's visually impaired present in developing countries. The quantity of individuals unsighted by infectious diseases has been greatly reduced by recent public health effects, however age connected impairment is increasing. Cataracts stay the leading reason for sightlessness globally, except within the most developed countries. Correction of refractive errors might offer traditional vision to quite twelve million kids ages five to fifteen. Globally concerning eightieth of all impairment is avertable.

Blindness could be a state of lacking the perception because of physiological or medicine factors. Partial sightlessness represents the dearth of integration in growth of the optic tract or visual center of the attention, total sightlessness is full absence of the visual light-weight perception. because of the on top of mentioned downside Blind folks face inaccessible infrastructure and social challenges. Walking into queer close is that the strict two-faced by challenged folks, the person with complete loss of vision faces discomfort to navigate around places. The most valuable thing for a disabled person is gaining independence.

A blind person can lead an independent life with some specifically designed adaptive things for them. There is lots of adaptive equipment that can enable a blind person to live their life independently. Blind person needs to hunt and put much effort to get equipment that can take them one step closer towards independence. In order to overcome this difficulty we introduce this smart guiding glass for blind using ultrasonic sensor.

II. SYSTEM MODEL

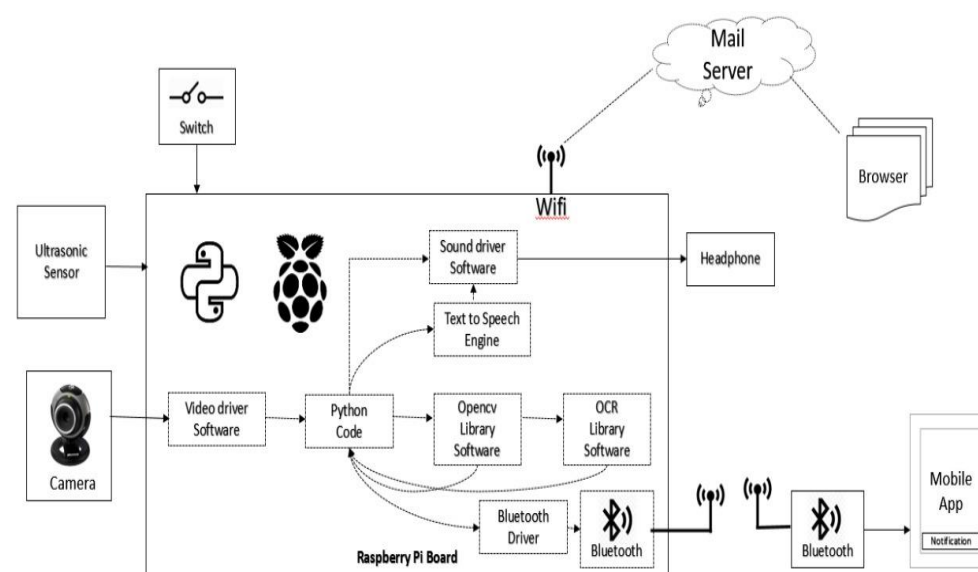


Fig 1. Block diagram of proposed model

III. LITERATURE SURVEY:

The paper as in [2] by sreenu ponnada (2018) narrates about the low weight electronic stick is built to facilitate the visually challenged in reaching the visually challenged in reaching their destination with ease. it recognizes the manhole and detects the staircase.

The paper as in [3] by Jahan razavi (2019) narrates about the device that helps the blind detect stairs. A pair of sunglasses is used in which ultrasonic sensor, buzzer are fitted to it. It is used to detect the stairs.

The paper as in [1] by Jinqiang bai (2017) describe about the smart guiding glasses for visually impaired people in indoor environment. A multi sensor fusion based obstacles which utilize both the depth sensor and ultrasonic sensor to decode the complication of detecting small obstacles and transparent obstacles. This prototype is developed with a pair of sunglasses and several low cost sensors.

The paper as in [4] by Rohit agarwal(2017) narrates the obstacles detection module which has a ultrasonic sensor, processing unit and buzzer fitted to sunglasses that helps the visually impaired people by detecting obstacles by giving a buzzer sound as output.

The paper as in [6] by Akhilesh Krishnan (2016) describes the smart walking stick which assist the visually challenged people to identify obstacles and provide assistance to reach destination. The assistor works based on echo location.

IV. EXISTING WORK:

Technology can help in minimizing many barriers that people with visual disabilities face. These technologies are known as assistive technology (AT). Many ATs have been proposed to help the visually challenged. The following section describes existing proposals or systems to be helpful for the blind.

The blind Cane is one of the assisting tools for the visually challenged and it is important [3]. It was intended for testing the visually challenged to utilize their brain to memorize a set of objects. It aids its user to understand their surroundings but, if the user walks into a new environment, they will find it difficult to memorize the locations of the object or obstacles. The blind cane cannot detect any obstacle which is present in front of the person. There is no possibility of a practical application of this cane due to its requirement of extensive training.

The Guide Cane was designed to help the visually challenged people navigate safely and quickly among obstacles and other hazards, but it is considerably heavier than the white cane. Our proposed system is used to overcome the above mentioned drawbacks.

The main problem of visually pair person to detect the object and emergency of person also not notified.

V. PROPOSED WORK:

This device is employed to help the blind to notice obstacles. we have a tendency to propose a sensible glass for visually impaired individuals to beat the traveling difficulties. It will observe the obstacles and live the space dead by mistreatment inaudible device. when receiving data from setting, it passes to the visually impaired person through a electro-acoustic transducer. A switch is connected to the system that is employed for associate degree emergency condition, it record a location video at real time and send it to their guide. This can be a really safe and strong guidance device that helps several blind travelers with no worry regarding any obstacles on their moving path. so it performs as a client device for allocating the blind individuals to travel safely.

In this project we have to solve the problem of those things to be rectified that problem. We can use voice assistance based on obstacle detection and guiding also another person by Rasperry pi .

ULTRASONIC SENSOR

Ultrasonic sensors area unit are used around world, inside and outdoors within the hardest conditions, for different applications. It counts the gap between the obstacles by emitting the sound waves from its device heads at the frequency higher than twenty rate. Then they anticipate the sound to be mirrored back, calculative the gap supported the time needed.

Specification of the device is given below

- Operating voltage: +5V
- Theoretical measure distance: 2cm - 400cm
- Practical measure distance: 2cm-80cm
- Accuracy: 3mm
- Measuring angle : 15 deg
- Operating current : 2ma



Fig:1.1 ultrasonic sensor

HC-SR04 supersonic device may be a four pin module whose pins names are Vcc, Trigger, Echo, and Ground. HC-SR04 distance device is usually used with each microcontroller and silicon chip platforms

Ultrasonic device embedded within the glass the obstacles ahead transmit unhearable waves. If the device senses obstacles the output receiver gets activated and this transformation are going to be known by raspberry pi. Thus, it prompt alerts the person as shortly because it receives the triggered output. supersonic device is usually examined.

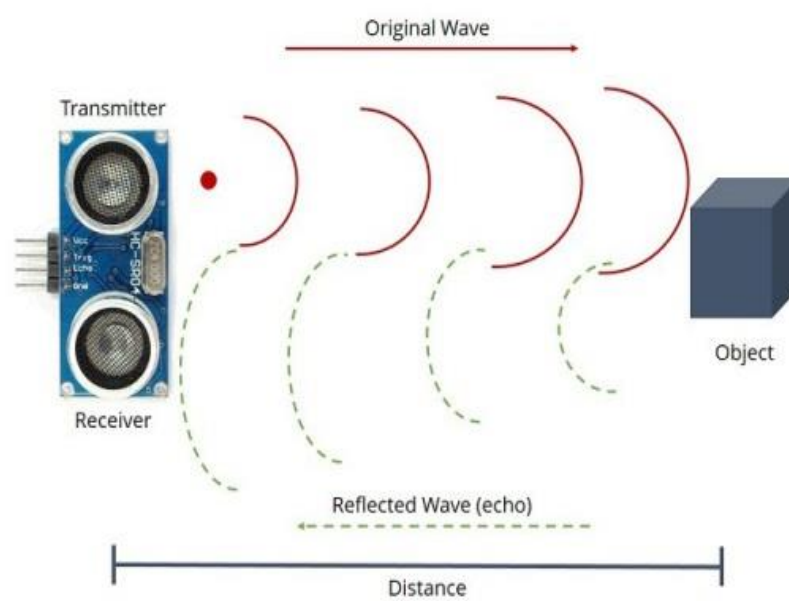


Fig:1.2 working of ultrasonic sensor

RASPBERRY PI 3:



Fig 1.3 : Raspberry pi 3

Raspberry Pi three models may be a little MasterCard size laptop. simply add a keyboard, mouse, display, power provide, small SD card with put in UNIX distribution. it's associate open supply platform wherever we will get heaps of knowledge therefore, exploiting raspberry pi we will customise the system relying on our need.

This digital computer runs our algorithmic rule, that helps to calculate the space from the obstacles supported the Input it receives from sensors. Then it additionally sends a live location video to guide once the blind colloids with emergency condition and guide can instruct them through earphone.

ROM, I/O peripherals within it .Raspberry pi has the power to move with the surface world.

WEBCAMERA:

A digital camera could be a video camera that feeds or streams its image in real time to through a laptop to a laptop network Webcams generally include a lens, a picture detector, support physical science, and should additionally embody one or perhaps 2 microphones for sound. common uses embody security police work, laptop vision, video broadcasting, and for recording social videos.

Webcams area unit typically cheaper than a customary video camera and permit for face-to-face communication on-line and creating it simple maybe things visually to the person you're reprehension.

IMAGE SENSOR:

An image sensor is a device used to detect and conveys the information to create a image. It converts when the light pass through or reflect from the objects. Signals, small amount of current burst to convey the information. The light or electromagnetic radiation are the waves.

DISTANCE MEASURE NENT

Blind person range could be near for the sensor used. But in a crowded place, it'll be a great disadvantage because of existing redundant objects in this range.

The obstacle information about closeness is given by instruction through a headphone attached to the glass. the sound from the glass varies with the distance. The more the obstacle comes closer, the more the sound becomes louder and its pitch becomes different. Thus the blind person can have an idea about the distance the obstacle, before the person gets any more close to the obstacle.

EMERGENCY HELP:

While roaming outdoor or indoor the blind person may face difficulties that can't escape on their own, so that the blind carrying stick. We are providing a method so that the blind person can ask for emergency help when needed. If the person somehow moves out from the route to an unknown place where it's very hard to find the place or the person is hurt or feeling sick, with just the help of pressing a button it generates the call automatically to the guide and send the present site in real-time and ask for help from a guide, the guide phone number default uploaded on the mobile.

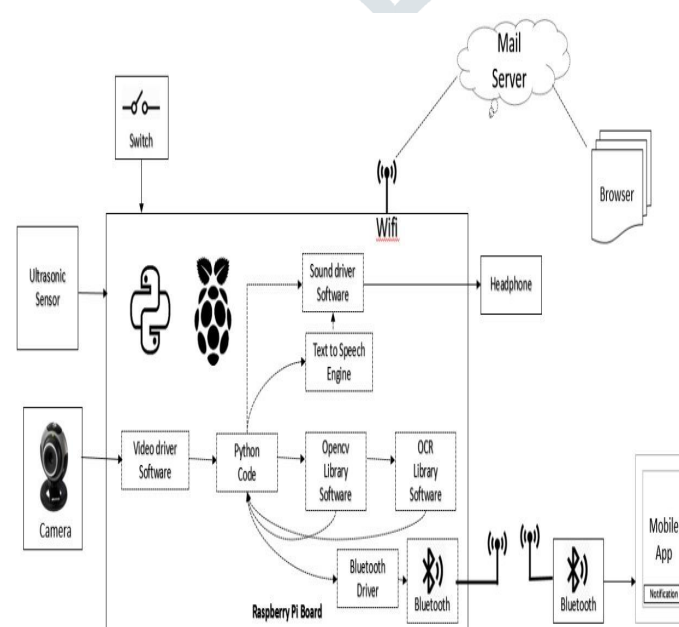


Fig 1.4 proposed model

VI. CONCLUSION

This paper proposes an device within the variety of raspberry pi. There are several features while using this device as follows:

- A device that helps visually impaired individuals as walking help
- Uses sensors to collect data of obstacles
- A device that may be used while not net property
- A device that notifies the user concerning obstacles within the variety of speech

As explained earlier, this system is meant to be placed on the visually impaired person's sunglass. This will increase the convenience with that the device is carried and conjointly the time to setup the device is incredibly less. In addition, if a GPS is put in onto the device, it may conjointly facilitate navigate the person in out of doors surroundings.

Experimental results verified that the planned navigation device was effective enough on serving to the visually impaired individuals walk from one place to a different. The sensors embedded on the device have the characteristics of low price, tiny size and simple integration. Thus, it's nice potential in shopper market, particularly electronic travel aids market the scope of this project is to device a system that may offer additional independence to the visually impaired in terms of the direction ability in unknown areas and to enhance their comfort and safety throughout once walking with none facilitate like human guides or guides dogs. The planned system needs to solve in future development.

ADVANTAGES:

This device is taken a low design time, and its production cost is low. This application is useful for both indoor and outdoor environment. This blind glass is dynamic system It take Low power consumption, this glass occupy a less space in blind. Compact and helpful to the society economical and efficient device

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