

Blind Assistant

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Abstract—The Paper presents a model to facilitate blind folks with proper aid. the most aim is to decorate blind folks with necessary steerage for effective motility . Through this system a sense of artificial vision will be provided that will facilitate in providing resolution to visually defected person. varied detectors such as camera sensor,IR detector and inaudible detector with raspberrypi along kind the base of the system. The paper exhibits a theoretical model and a system idea to offer a sensible electronic aid for blind folks. The system provides object detection ,real-time help .The system contains Sharp IR sensing element, inaudible sensors , , stereo cameras and Audio feedback system.The aim of the system is to supply a value optimum and economical aid for blind that provides a way of artificial vision by providing data concerning the environmental state of affairs of stable and movable objects around them.

Index Terms—Ultrasonic sensor,Camera sensor,IR sensor,Rasoberry-pi.

I. INTRODUCTION

Vision is that the most vital a part of human physiology as eighty three p.c of knowledge human being gets from the surroundings is thru vision. The 2011 statistics by the World Health Organization (WHO) predicts that there area unit 285 billion folks in world with disability , thirty-nine billion of that area unit blind and 246 with low vision.The most issue two-faced by a sand-blind person is downside in reading the text and detection the thing before of them. This is a system for blind peoples to try and do their activities while not the assistance of others.This system is developed by mistreatment Raspberry Pi and A battery backup. Thus, the user may use this device anyplace and able to use anytime.The inaudible sensing element starts operating once there area unit any obstacles before of the blind user and alerts them the voice output.

II. EXISTING TECHNOLOGY

1) **Smart stick for blind** : This paper presents a system that provides help for visually impaired people.The system consist various sensors like Proximity sensor,Ultrasonic sensor and it provides feedback via vibratory circuit.

2) **Smart guiding system for blind** : This paper proposes a model with an aid for the blind people.The main aim of the system is to provide a safe mobility within the environment.the system make use of various sensors such as water sensor,smoke sensor and ultrasonic sensor.It alerts the user by using the buzzer.

III. SYSTEM DESIGN

The design consists of two units:

- Obstacle detection unit.
- Image Processing unit.

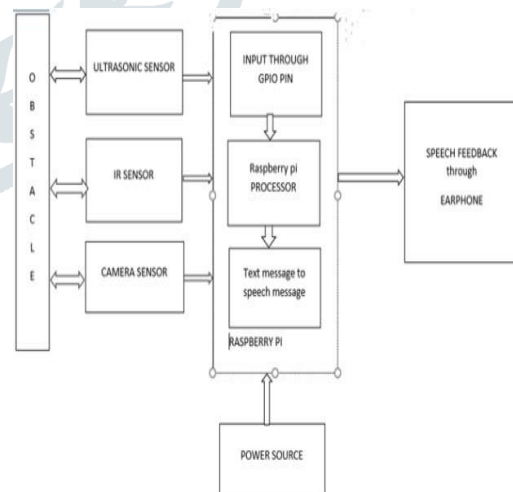


Fig. 1. Block diagram

The diagram higher than depicts the planned style of an embedded Blind assistant.The system components consist of numerous subsystems. The device based mostly electronic equipment consists of devices like Ultrasonic sensor,IR device and camera device.The planned system can be designed to require variety of a detachable and moveable device, which

may be categorically mounted on a glasses. There is speech feedback system to offer audio feedback/guide user.

A. Obstacle detection unit

- Ultrasonic sensor

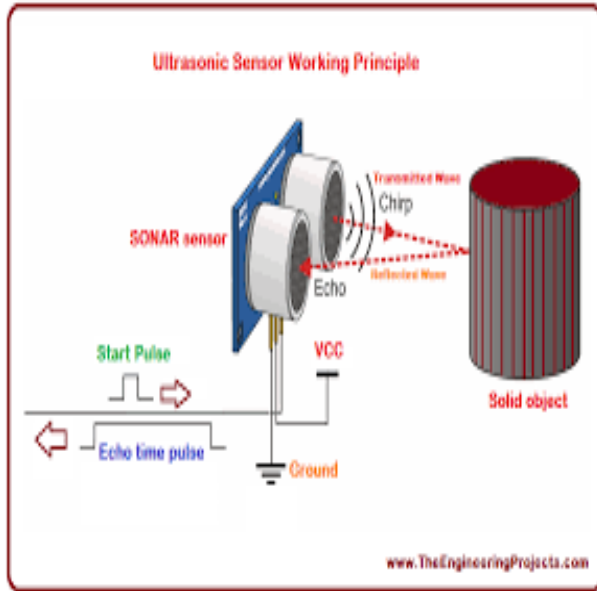


Fig. 2. Ultrasonic sensor

From 2cm to 40cm, the supersonic ranging module HC-SR04 varies and also the go accuracy is of 3mm. The transmitter within the supersonic sensing element spreads ultrasonic waves during a explicit direction and also the temporal arrangement can be started once the waves square measure emitted. In the air, the ultrasonic waves square measure unfold and also the waves gets came immediately once it encounters any object in its path. When the mirrored wave is received, the receiver within the supersonic sensor stops the temporal arrangement that's started by the transmitter. The distance between the meant target and also the transmitter is calculated by exploitation the formula, $s=340t/2$, because the rate of ultrasonic waves is 340 m/s. this can be known as because the time difference distance activity principle. The identified air spreading rate, i.e. by activity the time for the waves from the time of transmission to the receiving of the waves after the contact with the target and also the distance is calculated by exploitation time and rate of the waves is that the principle of supersonic distance activity.

- Sharp IR Sensor

A sharp infrared sensor uses a ray of infrared light bombards on an object to calculate its distance. The distance is calculated by using the speed of the ray i.e 344m/s and calculating the time between the emitted ray and the reflected ray. The sensor consists of an IR LED and a light detector or Position Sensing Device.

When the position of the object changes, the angle of the emitted ray and the position of the spot on the Position

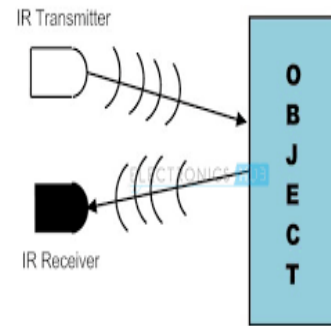


Fig. 3. IR Sensor

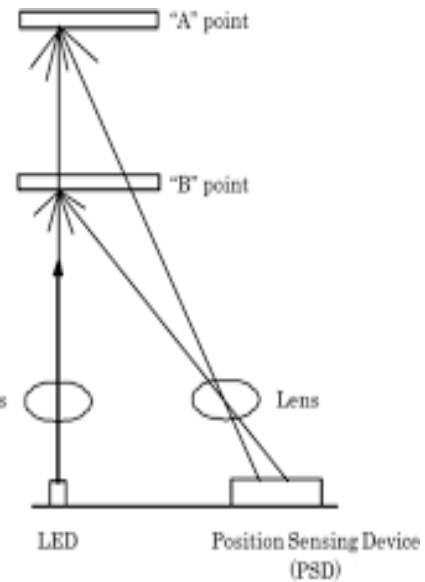


Fig. 4. Working of IR Sensor

Sensing Device changes as well. See point A and point B in the fig.4. The sensor has a in-built signal processing circuit. This circuit calculate the position of the optical spot on the Position Sensing Device to find the position (distance) of the ray reflecting object. It outputs an analog signal which is dependent on the position of the object in front of the sensor

B. Image processing

1) *YOLO-You Only Look Once*: You only look once (YOLO) could be a system for police work objects on the Pascal VOC 2012 dataset. It will notice the twenty Pascal object classes:

- people
- bird, cat, cow, dog, horse, sheep
- aeroplane, bicycle, boat, bus, car, motorbike, train , chair, table, potted plant, sofa, tv or monitor

The formula apply the model to a picture at multiple locations and scales. High probability areas of the image are thought of throughout detection. We apply one neural network to the

total image. This network partition the image into varied blocks and predicts bounding blocks and probabilities for every block. These bounding blocks are compared with the expected heuristic values of every block.

2) *Darknet*: Darknet:: Darknet could be a platform to coach neural networks,It is open supply and written in C/CUDA and is the idea for YOLO. Darknet is employed for coaching YOLO

3) *PYTTX*: Pyttx may be a platform to convert text to speech.It is library that is platform freelance. However, Pyttx works solely on Python . Hence, we'll see It works offline, not like alternative text-to-speech libraries. instead of saving the text as audio file, pyttx really speaks it there. This makes it a lot of reliable to use for voice-based comes.

C. Micro processor

1) Raspberry-pi

The Raspberry Pi may be a value optimum ,card sized pc that connected into a pc monitor or TV, that uses keyboard and mouse. It's a capable little device that helps individuals of all ages to explore computing, and to be told a way to program in languages like Scratch and Python.It has forty GPIO pins that area unit want to connect completely different sensors to produce efficient and effective interface for inter-communication between them.

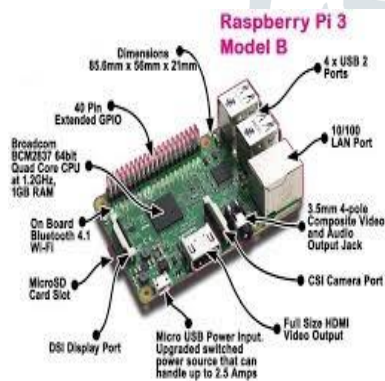


Fig. 5. Raspberry-pi

IV. ADVANTAGES

- It detects the image and gives voice output for visually impaired human beings.
- Determining obstacles around the user from ground to the head.
- Provide information about the distance between user and obstacle.
- Essential direction instruction.
- Increases the confidence of visually impaired person with respect to the society.
- It protects the blind people from getting injured.

V. LIMITATIONS

- It might be unsuitable for crowded areas leading to generation of ambiguity.
- Obstacle detection relies on user abilities.
- Space conflicting issues for long distance.

VI. RESULT

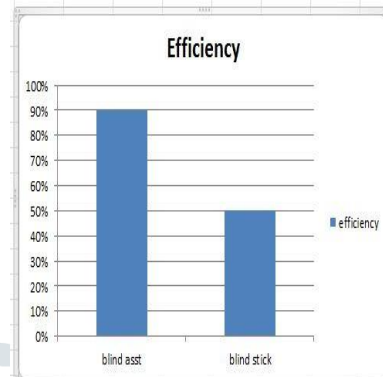


Fig. 6. Efficiency of the system

This device is mounted on glasses and it also consist of a battery backup,this makes the device portable.The device is also capable of object recognition and able to measure the accurate distance of the object to improving the communication of the device within environment.so we can say that this Device is efficient than others e.g blind stick.

VII. CONCLUSION

This system assist the blind with effective obstacle detection by using ultrasonic sensor and mobile object detection through SIR(sharp IR sensor).This device is helpful for blinds while wandering in surroundings independently.This device avoid accidents and guides visually impaired people.

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