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SMART BLIND STICK

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ABSTRACT: Today technology is growing to a bigger extent, but there's no value-effective device for visually impaired folks. God precocious sense of vision to the human being is a very important side of our life. However, there are some unfortunate those who lack the flexibility of visualizing things. Throughout their daily lives, they need to face additional challenges. For a visually impaired person, it becomes not possible to try to his/her day to day activities, after you take them into account, you may notice that without the help of others they cannot walk towards their destination one has to guide them the directions. Therefore, sensible Blind stick will facilitate visually impaired folks in moving and permitting them to perform their work simply. The smart stick will have sensors embedded with it, thereby it senses the objects/intruder, when any objects or obstacles come in range of an ultrasonic sensor then the person is alerted with a quick response time using a vibrator and buzzer that provides voice output. The stick senses the item before the individual and provides the user direction with a vibration. This stick additionally incorporates a camera for effective obstacle detection. The system is meant to supply overall measures – Artificial vision and object detection. Coming up with a price-effective and economical blind stick is that the main aim of the project.

KEYWORDS: Arduino, inaudible sensing element, Camera, Object detection.

I.INTRODUCTION

There are about 253 million humans with vision impairment, 36 million are blind and 217 million have moderate to severe vision impairment. 81% of people who are blind are aged 50 years and above (WHO estimation). Even for the non-visually impaired the congestion of obstacles is usually problematic, it's even worse for the visually impaired. The amount of visually impaired humans is predicted to grow within the future because of varied reasons. As a result, there's a requirement for a price-effective system that may be utilized by blind humans to steer simply and well. It's necessary that a sensible answer is planned for the blind folks so they will use this in their everyday life. Existing devices are able to detect and recognize objects that emerge on the floor, but a considerable risk is also included that the objects that are at a sudden depth, or obstacles above waist level or stairs. So we were motivated to develop a sensible white cane to beat these limitations. This paper proposes the planning and development of a sensible stick to assist visually impaired folks. We tend to accomplish this goal by adding sensors at specific positions to the cane that provides data concerning the surroundings to the user through audio feedback. Total blindness is the complete lack of form and visual light perception and is clinically recorded as NLP, an abbreviation as "no light perception". The system has been developed using both hardware and software implementations. The main component of this technique is that the Radio-Frequency module that is employed to search out the stick if it's misplaced around. This technique is additionally enabled with a camera that detects the article and faces of individuals by exploiting CVV and tell the person through a voice message.

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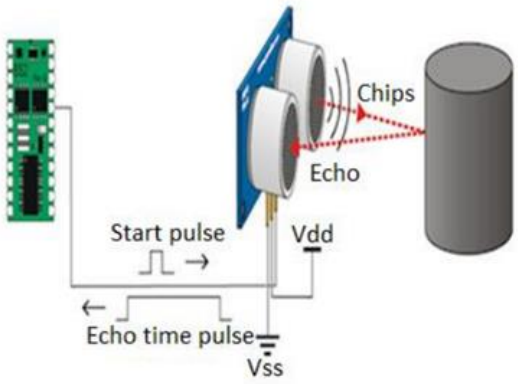
II.LITERATURE SURVEY

Numerous attempts within the society to assist the blind. “Project Prakash” may be a humanitarian mission to assist the blind kids particularly by coaching them to utilize their brains to find out a group of objects around them [3]. The stick encompasses a ping navigational instrument sensing element to sense the distant objects. It additionally encompasses a water detector. The micro-controller used is PIC microcontroller. The microcontroller circuit is on the skin of the stick however is protected with a code thus its security can't be broken. The sole feedback given to the user is through the vibration motor [4]. 3 sensors are used viz. ultrasonic, pit sensing element and therefore the water sensing element. Even this can be a PIC based mostly system. The feedback given is thru the vibration also because the speaker/headphones. there's a GPS system where-in the user must feed his location. No info on however a visually handicapped person would do this. Additionally they haven’t mentioned something concerning the scale and form of their cane and neither. A Navbelt was developed by Shovalet. al [5], associate degree obstacle turning away wearable PC that is merely for indoor navigation. Navbelt was equipped with 2 modes, within the initial one the system info was translated to audio in numerous sounds. One sound for complimentary for travel direction and different for blocked, it absolutely was tough for the person to differentiate the sounds. different downside was the system wouldn't understand the user momentaneous position. A stick for distance measuring infrared sensors, have introduced by S. Innet and N. Ritnoom [6] that may be a complicated and delaying method. The stick has totally different vibration modes for various vary that is tough for a blind to differentiate, it desires time for coaching. The stick informs the person clearly at dangerous stage that conveys less info and safety. The stick has no location and positioning options. Paper [1] Title: sensible Stick for the Blind an entire resolution to achieve the destination. this method uses IR sensing element, Ultrasound sensing element and water sensing element to observe the obstacle. However, this method simply offers associate degree alert if anybody of the sensing element is triggered, it uses a buzzer to alert the blind man. this method doesn't use any location symbol or location indicator. Paper [2] Title: hole detection for visually impaired that uses a camera that captures image fifteen frame per second and supported the conception of image process the hole is detected. downside with this method is use of camera makes it expensive , and additionally plenty of pictures captured per second will increase overhead and storage demand. Paper [3] Title: sensible Walking Stick for Blind describes a couple of Stick that use Raspberry Pi [10] associate degreed an supersonic sensing element to observe objects and interloper, the system additionally encompasses a camera embedded with it, and supported the pictures captured the objects are detected. The objects are analyzed supported the set of image datasets that are already keep. this method but, becomes pricey because of the utilization of high-end camera and additionally attributable to storage constraints as giant volume of datasets are required to be keep. this method, typically may also be inaccurate as a result of the obstacles are detected supported dataset (large set of images) as totally different objects vary in their form and size.

III.HARDWARE COMPONENTS

A. ULTRASONIC SENSOR

As the name indicates, ultrasonic sensors measure distance by ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception*An optical sensor has a transmitter and receiver, whereas an ultrasonic sensor uses a single ultrasonic element for both emission and reception*. In a reflective model ultrasonic sensor, a single oscillator emits and receives ultrasonic waves alternately. This enables miniaturization of the sensor head.



B. ARDUINO UNO R3

The current version of Arduino Uno comes with USB interface, half-dozen analog input pins, fourteen I/O digital ports that are accustomed connect with external electronic circuits. Out of fourteen I/O ports, half-dozen pins may be used

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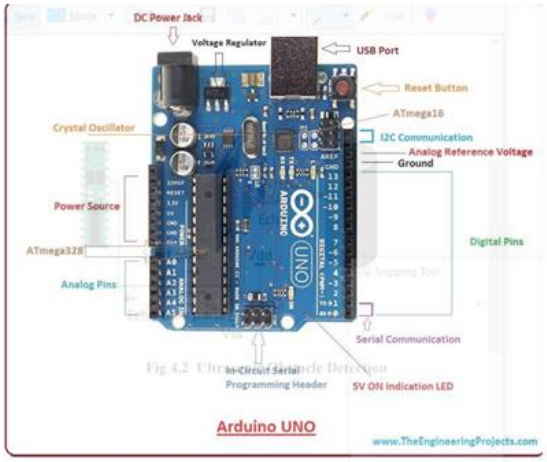
for PWM output. It permits the designers to control and sense the external electronic devices within the real world. It's accustomed connect all the elements and work in synchronous manner.



C.PIEZO BUZZER

The current version of Arduino Uno comes with USB interface, half-dozen analog input pins, fourteen I/O digital ports that are accustomed connect with external electronic circuits. Out of fourteen I/O ports, half-dozen pins may be used for PWM output. It permits the designers to control and sense the external electronic devices within the real world. It's accustomed connect all the elements and work in synchronous manner.

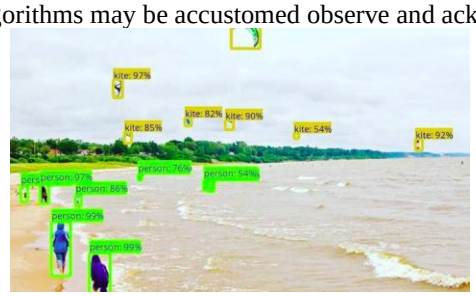
D. MISCELLANEOUS

I.Camera(as a)
II.Connecting wire
III.Voice output
IV.Resistor

VI. SOFTWARE IMPLEMENTATION

A. OBJECT DETECTION

OpenCV (Open source computer Vision Library) is associate degree open supply computer vision and machine learning software library. These algorithms may be accustomed observe and acknowledge faces, determine objects.



VII. WORKING

Our proposed project first uses ultrasonic sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the microcontroller. Camera detects the obstacles in real time using OpenCV. The microcontroller then processes this data and calculates if the obstacle is close enough or not .Then a warning through voice is given by buzzer and speaker.

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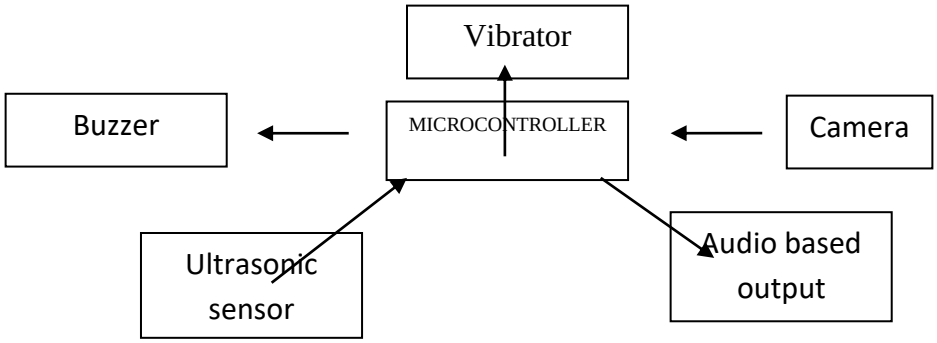
VIII. PARTS CONNECTED TO MICRO-CONTROLLER



IX. CONCLUSION

It is necessary that visually impaired people get access to an efficient and comfortable gadget in order to live their daily life comfortably. In a developing country like India, there is a need for a cost effective solution so that most of the people can have an effective product as proposed in this paper. The presented system is designed and configured for practical use.A simple, cheap, configurable, easy to handle electronic guidance system is proposed to provide constructive assistant and support for blind and visually impaired people.

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