ULTRASONIC AND INFRARED USING BLIND STICK WITH GPS TRACKING SYSTEM

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Abstract:

The enlarged use of sensible devices has caused great impact on the globe. Therefore this paper describes the idea of the system. This system is useful for the blind person to live their life safely, to feel sheltered and to work conveniently. In normal blind stick the detection of the obstacle is not efficient and not easy for the visually disabled person. Because they does not know what object or things come infront of them. They face problems like identifying the obstacles, nature of the objects like size and distance between the object and stick. It is very difficult to move here and there for the blind person. In smart stick the object detection is easy and fast with the help of different types of sensors and distance measuring also easier in this smart blind stick. If there is any object or obstacle comes infront of visually impaired person, they come to know about the obstacles by hearing the different alarm sound generated by the buzzer. The system is very useful for the blind persons who needs help from others.

Keywords:


1. Introduction:

Visually imasured people find difficult to move and they get distracted by the objects in front of them, they may even get lost. Generally blind people carries a normal blind stick as their movable kit. With the help of many new technologies, there are lots of devices to make the blind person move easily. Our main objective is to develop a efficient and good blind stick for the blind person to move safely without hesitations and make them feel comfort using sensors and modules.

The smart blind stick is a mechanical device used by the visually impaired persons to move safely without any help of others by detect the object and alerts the blind person. The range of the device is limited due to its own size. It will act as a good movable kit for the blind persons.

This system uses Ultrasonic waves emitted from ultrasonic sensor to detect the obstacles. If any obstacle is detected, then it alerts the blind person by passing the data to the microcontroller of the arduino and it will make a different buzzer sound.

The water sensor is used to detects the water and buzzer will beep to alerts the blind person. It is located in the bottom side of the stick. When the sensor comes in contact of the wet surface, it produces signal which triggers the controller. Then the buzzer beeps for alerting against wet surfaces.

The system also uses Infrared sensor to detect small size of the obstacles, staircases, pits and stones. This sensor also located at the bottom of the stick. When the IR sensor comes in contact with the obstacles, it will sends the signal to the arduino, as a result the buzzer will alert for small obstacle available on ground.

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In this system, by pressing the remote button, the location can be identified by a wireless RF primarily based remote. After pressing the remote button it sounds a buzzer on the stick that helps the blind man to search out their stick. So this technique permits for object detection and also for finding if the stick is misplaced by blind person.

An added feature is that the GPS system which might use for following the location of the blind man.

During night, LDR will have high resistance and no current pass through it. In LDR sensor, LED is connected parallel to it which illuminates and acts as a Flashlight, which can be easily noticed by others. This is due to LDR changes its resistances due to change of the light intensity. It alerts people about the presence of blind person to let him to help.

The ESP8266 WiFi module are interfaced with arduino controller used for internet connection and by using GPS for locating the location.

Arduino Nano board which consists of a microcontroller and a part of the software or (IDE) Integrated Development Environment. It is used to write & upload computer code to the board. The operating voltage of this arduino is 5V.

This system uses many sensor. Therefore the smart blind stick with GPS tracking system is very useful for the visually impaired people.

2. Existing Methods:

![Flow Chart of Ultrasonic Blind Stick](image)

Fig.1. Flow Chart of Ultrasonic Blind Stick

The ultrasonic sensor is used to detect the objects around the visually impaired people. To design and develop a remote control and to locate the walking stick, a wireless RF remote control switch is used. The water sensor is used to identify the water infront of the blind person. LDR sensor is used to identify the light and darkness and it gives information about the environment. IR sensor is used to identify the small pits and stones infront of them. GPS and GSM modules is used to track the blind person’s location.

These sensors sends the signal to the microcontroller. Then if there is any of the above mentioned obstacles is present the microcontroller passes the signal to alert the buzzer. This helps the visually disable people to navigate easily and safely.

Proposed System:

We planned a system which consists of a microcontroller, LDR sensor, IR sensor, ultrasonic sensor, water sensor, GPS and GSM module, RF transmitter and receiver, Wi-Fi module and a buzzer. Software part of our planned system are coded in...
Arduino IDE software that interfaced with the microcontroller. The Arduino nano consists of fourteen digital pins, eight analog pins, two reset pins and six power pins. The digital and analog pins are mainly configured as input or output of the system.

Ultrasonic sensor is used to detect the obstacle. It detects the obstacle in front of the blind person by using ultrasonic waves. It will detect within a distance of 400cm ahead. It passes a signal to the microcontroller, when the obstacle is close to the blind person and it alerts the person by sounds a different buzzer. Water sensor is used to detect the rainfall, the water level and presence of water.

In our planned system we use this sensor detect the presence of water sources. Water sensor reads low when the water is detected. This sensor is connected to the digital pin 8 of the Arduino nano. The Water sensor is placed at the bottom of the stick. As soon as water sensor comes into contact with the water it will alert the person by passes a signal to the microcontroller and sounds a different buzzer. The RF transmitter and receiver are interfaced with the microcontroller and coded in Arduino IDE. The IR sensor is interfaced with micro controller. The sensor is used to detect the obstacles. When any obstacles detected it will alert the blind person by passing a signal to the Arduino nano and it sounds a different buzzer.

The WiFi module is used to store the some details of blind person and the care taker of the blind person. This Wifi module is interfaced with the microcontroller. GPS and GSM module is to locate the location of the blind person and to send message to the care taker of the blind person if needs any help respectively. The sensors and modules used in our planned system are selected based on the efficiency, difficulties, atmospheric conditions and the cost.

**Result:**

We used ultrasonic sensor for detecting the obstacles. Our blind stick automatically detects the object in front of the person and give him/her a response to the stick with a alarming sound. Through this, the blind person can aware about the obstacles in front of him.

**Conclusion:**

In this modern generation there are lots of techniques to design a blind stick. Our ultimate aim is to design a smart blind stick which helps the blind person to travel safely. This also helps them to live their life in comfort zone. Our proposed system consists of Arduino Nano, Ultrasonic Sensor, Water Sensor, IR sensor, RF module, WiFi module, LDR sensor, GPS and GSM module and buzzer. We refered some more paper which are related to our system and this reference helps us to design a system effectively.

**References:**


