# 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 disable 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**:

Ultrasonic Blind Stick, Arduino Nano, Global Postioning System, Global System for Mobiles, Infrared Sensor, Light Dependent Resistor, Radio Frequency.

## 1.Introduction:

Visually imapired 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 sysetm 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.

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.
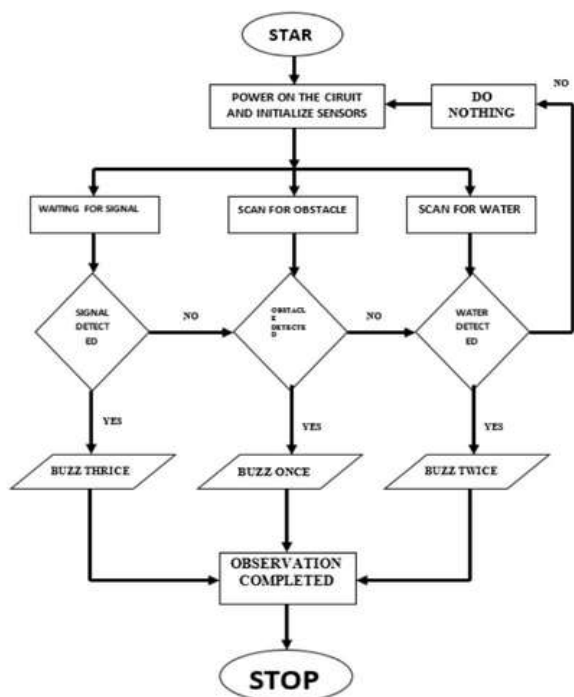
## 2. Existing Methods:



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 blindperson. 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:
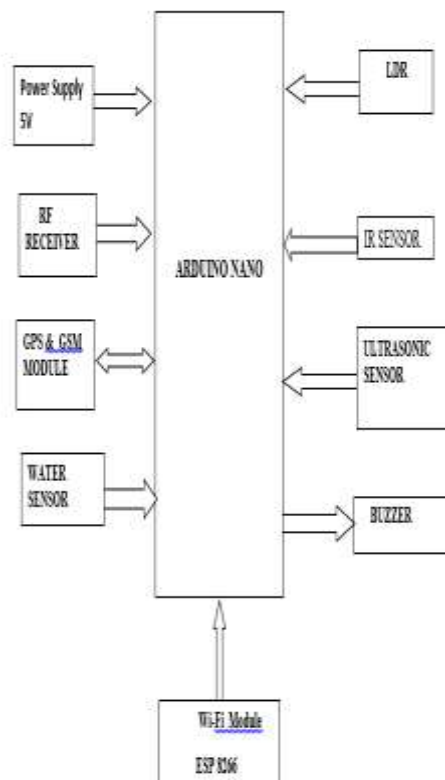


We planned a system which consists of a microcontroller, LDR sensor, IR sensor, ultrasonic sensor, water sensor , GPS and GSM module, RF transmitter and receiver, Wi-Fi module and a buzzer. Software part of our planned system are coded in

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 detect the obstacle infront 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 which 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 alerts the person by passes a signal to the microcontroller and sounds a different buzzer. The RF transmitte 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 live 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.

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