SAFETY GUARD FOR BLIND USING SMART STICK

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***Abstract*- The main objective of the SAFETY GUARD FOR BLING USING SMART STICK project is recommended to control a stick by using an obstacle-detecting feature.[1] The system is designed to control a blind person using a smart stick. The objective of this project is to facilitate the movement of people who are blind people who are not able to move well. The goal of this system will allow certain people to live a life with less dependence on others for their movements as a daily need. The blind stick is an innovative stick designed for visually disabled people for improved navigation.[7] We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advanced technology. The blind stick proximity infrared sensor along with light and water sensing. our proposed project first uses proximity infrared sensors to detect obstacles ahead using infrared waves. On sensing obstacles the sensor passes this data to the microcontroller.[3] The microcontroller then processes this data and calculates if the obstacles are close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is closed the microcontroller sends a signal to sound a buzzer. It also detects and sounds a different buzzer if it where detects water and alerts the blind.[1] One more feature is that it allows the blind to detect if there is light or darkness in the room. The system has one more advanced feature integrated to help the blind find their stick if they forget they kept it. A wireless RF-based remote is used for this purpose. Pressing the remote button sounds like a buzzer on the stick which helps the blind person to find their stick. Thus this system allows for obstacle detection as well as finding sticks if m is placed by visually disabled people. [7]**

Keywords: Proximity infrared sensors, intelligent stick, microcontroller, audio record & play.

I. INTRODUCTION

Nowadays, visually impaired person suffers from serious visual impairments preventing them from traveling independently. Accordingly, they need to use a void range of tools and techniques to help them in their mobility.[7] One of these techniques is orientation and mobility specialist which helps the visually impaired and blind people and trains them to move on their own independently and safely depending on their other remaining senses.[1] Recently, many techniques have been developed to enhance the mobility of blind people that rally on signal processing and sensor technology.[3] According to the literature, they are mainly classified into two measure aspects: sonar input (infrared signals, or ultrasonic signals). The way these devices operate is just like the radar system that uses ultrasonic sonar to detect the obstacle of fixed and moving objects.[2] The distance between the person and obstacles is measured by the time of the way traveled. However, existing systems inform the blind of the presence of an object at a specific distance in front of or near him. Information about the object's characteristics can create additional knowledge to enhance space. Manifestation is a memory of the blind. [1]To overcome the abovementioned limitations, this work offers a Smart Blind stick simple, efficient, configurable electronic guidance system for blind and visually impaired persons to help them in their mobility regardless of where they are, outdoors or indoors.

II. LITERATURE REVIEW

Diana Earshia, S.M.Kalaivanan, K.Bala Subramanian, "A Wearable Ultrasonic Obstacle Sensor for Aiding Visually Impaired Blind Individuals (2014). [2]

To identify obstacles for blind people to overcome problems. Here the mixing for the sound is air and the soundwave used is ultrasonic, the distance between the object and sensor is calculated using this. This system recognizes voice and command and converts them to desire data coordination and data transmission via a microcontroller. This research work has presented work of `a voice recognition system for electronic devices.

Safety guard for a blind system for the visually impaired persons did by Somnath and Ravi (2012). [4]

To provide the speed and the distance to reach the destination.when the ultrasonic sensors detect any the obstacle in front of the blind person so that they operate in a manner similar to a flashlight. The ultrasonic sensor has

wide there activity an ability to unable to search for many obstacles at one time.

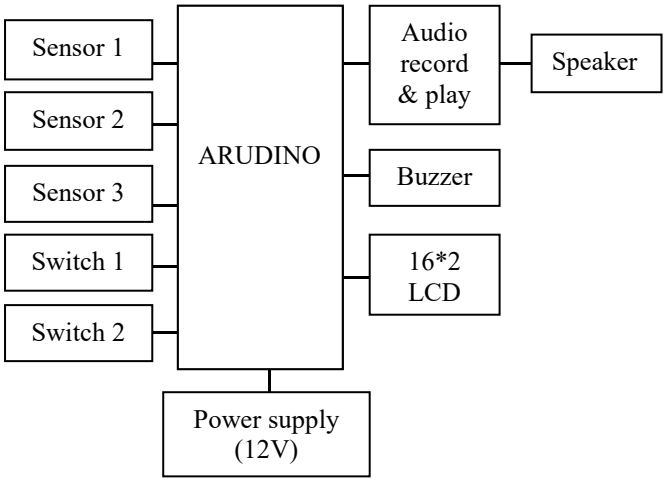
We are going to achieve the following points:-

With the help of this project, we can detect the obstacles in front of blind people who will get notified about the obstacle. We are also going to add one more feature to this project which is a water sensor. This will help the blind person identify water obstacles.

III. COMPONENT AND HARDWEAR USED

Infrared sensor, audio record speaker, Arudino, water detector sensor, buzzer.

IV. BLOCK DIAGRAM



Block Diagram

V. ADVANTAGES

- Auto detection.
- Having feature to left & right turn alarm signal.
- Obstacle detection with indication support.
- Dig information with indication alarm.
- Simple to use.

VI. SPECIFICATION OF COMPONENT

VI.I. PROXIMITY INFRARED SENSOR

An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with spectral sensitivity in the infrared wavelength range 780nm…50m. IR sensors are now widely used in motion detectors. They are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.
Sensing range:- 3-80cm
Adjustable sesnsing object:- Translucemcy
Opaque supply voltage:- DC5V
Load current:-100mA
Output opration:- Normally open(O)
Output:- DC three wire
System diameter:-18mm
Length:- 45mm
Appearance :- threaded cylindri cal material: plastic guard mode:-rever se polarity prot.

VI.II. WATER SENSOR

The water sensor module is an easy tool for water detection. It can be used as a switch when a water drop falls through the watering board and also for measuring waterfall intensity.[1]
Range :- 0 to 45% volumetric water content in soil (capable of 0 to 100% VWC with alternate calibration)
10-bit resolution (using CBL 2):- 0.4%
Power:- 3mA @ 5VDC
Operating temperature :- -40°C to +60°C
Dimensions:- 8.9 cm ×1.8 cm × 0.7 cm(active sensor length 5cm)

VI.III. SPEAKER

This is a device that uses an electromagnetic coil and diaphragm to create sound.[3] This is the most common type of speaker in the world today. How does it work? The modem speaker uses an electromagnet to turn electric signals of varying strength into movement.
Diameter:- 39mm/ 1.5
Weight:- 4.6g
Resonant frequency :-440 ±20% HZ
Impedance:-8 ohm ± 15% at 1500HZ
Rated input power:- 0.25W
Frequency range:- 440 ~ 20 KHZ

VI.IV. I2C LCD DISPLAY

This is a 16x2 LCD screen with an I2C interface. It can display 16x2 characters on 2 lines when a character is on blue background. Usually, the Arduino LCD project will run out of pin resources easily, especially with Arduino Uno. And it is also very complicated with the wire soldering and connection. This I2C 16x2 Arduino LCD communication interface. It means it only needs 4 pins for the LCD: VCC, GND, SDA, and SCL. It will save at least 4 digital/ analog pins on Arduino.
Character size:- 2.95 mm wide × 4.35 mm high.
Vtg requirements:- 5 VDC+/- 0.5 V
Current requirements:- 2 mA @ 5 VDC

VI.V. AUDIO RECORDER

Analog-to-digital converters(ADCs) and digital-to-analog converters(DACs). High-quality audio/voice systems with lower bill-of-material costs can be implemented with the aPR33A series because of its integrated analog data converters and a full suite of quality-enhancing features such as sample-rate converters. The aPR33A series C2.0 is

specially designed for the simple key trigger, user can record and playback the message an average of 1,2,3,4…8 voice messages by the switch, it is suitable for a simple interface or need to limit the length of a single message, e.g., toys, leave messages system, answering machine, etc.
Automatic power-down mode
Signal 3.3V power supply
Push-button interface
Dimensions :- 37×54mm

VII. EXPRIEMENTAL SETUP

The stick works as follows when a blind person will walk with a stick and if the Infrared sensor senses an object under its range, it will send an acknowledgment to the Arduino and thus the buzzer will buzz and the person has to know to change the path.[3] Similarly, if the person walks on a road where there is a large water level or grease materials, thus buzzer activates.

VIII. CONCLUSION

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It is worth mentioning at this point that the aim of this study which is the design and implementation of a smart walking stick for the blind has been fully achieved the Smart Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to navigate safely both indoor and outdoor.[1] It is effective and affordable. it leads to good results in detecting the obstacles on the path of the user in a range of 3 meters.

IX. REFERENCES

[1] “Smart walking stick - an electronic approach to assist visually disabled persons”, Mohammad Hazzaz Mahmud, RanaSaha, Sayemul Islam.(2014)
[2]Diana Earshia, S.M.Kalaivanan, K.Bala Subramanian, “A Wearable Ultrasonic Obstacle Sensor for Aiding Visually Impaired Blind Individuals (2014).
[3] “Multidimensional Walking Aid for Visually Impaired Using Ultrasonic Sensors Network with Voice Guidance”, Olakanmi O. Oladayo.(2010)
[4]”Safety guard for a blind system for the visually impaired persons did by Somnath and Ravi” (2012).
[5] The electronic travelling aid for blind navigation and monitoring by Mohan M.S Madulika (2013)
[6]Hashino, S.; Ghurchian, R.; A blind guidance system for street crossings based on ultrasonic sensors. Information and Automation (ICIA), 2010 IEEE International Conference on June 2010
[7]vision based navigation system for the blind China Computer Science and Automation Engineering (CSAE), 2011 IEEE International Conference on 10-12 June 2011
[8]https://create.arduino.cc/projecthub/muhammedazhar/third-eye-for-the-blind-8c246d
[9] https://en.wikipedia.org/wiki/Arduino
[10] http://www.engineeringtoolbox.com/friction-coefficients-d_778.html