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Smart Blind Stick

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Abstract :- in this paper, we are build this smart blind stick for blind peoples, because of sometimes accident was created and also they are facing many problems like that so we are using ultra sonic sensor here also this project is base on Arduino Uno.

Keywords:- *Arduino Uno, Ultrasonic Sensor, Blind Stick, Blind Peoples.*

I. INTRODUCTION

People who are unable to use their vision are said to be blind. About 80% of the information that humans learn about their surroundings comes through their eyes. As a result, it was challenging for the blind to integrate into society. An alternative to the common walking stick is the Smart Blind Stick. This wand can identify an object in front of a user and respond by buzzing the wand's buzzer. With this cane, a person can walk more assuredly. We use an Arduino UNO board, an ultrasonic sensor, a buzzer, and a battery in our project. The Arduino microcontroller is able to complete all computations rapidly and accurately. A person can use an ultrasonic sensor to find an object in front of them.

II. LITERATURE REVIEW

Authors Naiwrita Dey, Ankita Paul, Pritha Ghosh, Chandrama Mukherjee, Rahul De, and Sohini Dey presented the design and implementation of an ultrasonic sensor-based walking stick for visually impaired people in their 2018 publication, "Ultrasonic Sensor Based Smart Blind Stick."

This walking stick can help the blind navigate safely. Within a range of 5 to 35 cm, it can detect obstacles. (1)

A "smart stick with an assistive infrared sensor for blind persons" The authors of this study are Ayat A. Nada, Mahmoud A. Fakhr, and Ahmed F. Seddik. It was published in 2015. In this study, we suggest a smart stick based on infrared technology that is lightweight, affordable, user-friendly, quick to respond, and low power consuming. A pair of infrared sensors can identify the presence of stairs and other impediments.(2)

For the Blind and Visually Impaired People, Smart Stick 2018 saw the publication of this essay by Mukesh Prasad Agrawal and Atma Ram Gupta. We made the decision to help these people with disabilities by developing a technology-based solution because we live in a technologically advanced society. It is known as the "Smart Stick." It is a tool that directs the user by detecting obstructions in the user's line of sight. With the aid of numerous sensors that have been fitted, it will detect every obstruction in the way. (3)

IOT-based "Virtual Eye for the Blind" Authors Niveditha K., Kavya P. D., Nivedha P., Pooja B., and Lakshmikantha G. C. published this paper in 2020. In this study, we offer a smart stick indoor and outdoor assisted navigation system for blind and visually impaired people. Our solution addresses this issue by giving blind people a smart stick that serves as a virtual eye, enabling them to live independently and independently of others. (4)

"Develop and Use A Smart Blind Stick" Author Alaa H. Ahmed released this essay in 2018. We employed three ultrasonic sensors in this paper. The front of the stick has one sensor, while the left and right sides of the stick each have two sensors. Vibrating motors and buzzer sirens have been employed to detect motion practically from every angle, alerting the user if an obstruction is detected close by. (5)

Think "Smart Blind Stick" The authors of this study are Sameer Grover, Aeysha Hassan, Kumar Yashaswi, and Prof. Namita Kalyan Shinde. It was published in 2020. The Smart Blind Stick incorporates moisture detection at its bottom to determine the moisture of the soil or ground in order to determine whether it is possible for the person to walk on that specific ground. The Smart Blind Stick uses sensors present in the systems to automatically. (6)

Implementing Smart Blind Stick Design

Paper written by Amira A. Elsonbaty and published in 2021. In order to improve attentiveness and movement in the blind, this article has developed a concept prototype of sticks for blind persons that use sensor technology. Blind people have the ability to detect objects up to 70 centimetres distant and can receive feedback in the form of vibration and sound. (7)

A. PROBLEM STATEMENT :-

- Blind people can't easily recognize obstacles or stairs while using normal blind stick.
- No safety features on the normal blind stick .

B. Objectives :-

- Our main objective is to help blind person to walk without any fear by using smart blind stick.
- The smart blind stick will detect the obstacles coming in their path and make the person alert by beep sound that can be in the form of alarm or buzzer. Stick uses ultrasonic sensor for obstacle detection.
- Use of this stick will be the solution to overcome their difficulties

C. Block Diagram :-

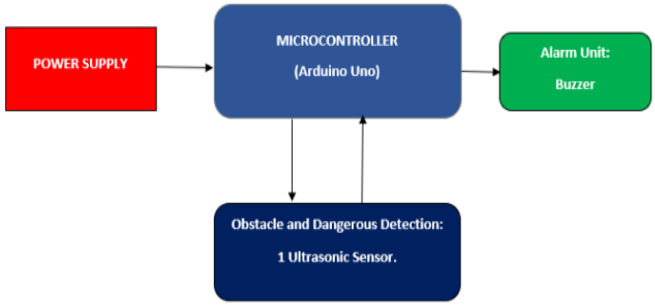

Fig. 1 Block Diagram

Four blocks—a microprocessor, a power source, an obstacle detector, and an alarm unit—make up this block diagram. The microcontroller (Arduino uno) is the most significant building part because it regulates all the other components of the electronic circuit. These gadgets are designed for embedded applications that need both computing power and quick, accurate communication with electronic, digital, or analogue parts. Power supply is another block that is crucial since it provides power. When an impediment is present in the path, the ultrasonic sensor senses it and detects it by alerting the buzzer. The power source powers the microcontroller, or Arduino Uno, and it then completes the circuit.

D. Design and Implementation Details

➢ *Components Requirement :*

1. Arduino Uno
2. HC- SR04 Ultrasonic Sensor
3. PVC Pipe
4. Jumper Wires
5. DC Buzzer
6. Battery Connector
7. 9V Battery
8. LED Diode
9. Cable Tie Clips

III. SOFTWARE-HARDWARE SPECIFIC REQUIREMENT

➢ *Software Requirements:*

- *Arduino 1.8.3*

The open source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

- *Proteus 8 Professional*

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and technicians to create schematics and electronic prints for manufacturing printed circuit boards.

IV. HARDWARE REQUIREMENTS

A. Arduino Uno R3 board :

Fig 2 . Arduino Uno R3

A microcontroller board called Arduino Uno is based on the 8-bit ATmega328P microcontroller. It also includes additional parts to support the ATmega328P microprocessor, including a voltage regulator, serial connectivity, and crystal oscillator. The Arduino Uno comes with a USB connection, a Power barrel jack, an ICSP header, 6 analogue input pins, 14 digital input/output pins (of which 6 can be utilised as PWM outputs), and other features

B. Ultrasonic sensor HC-SR04:

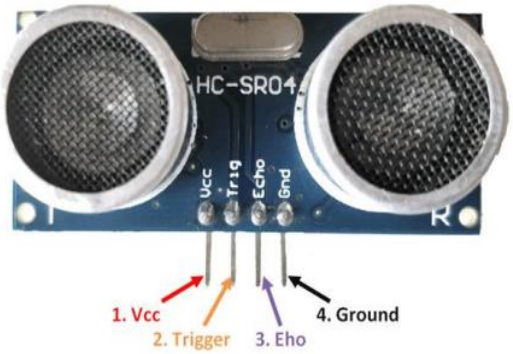

Fig. 3 Ultrasonic sensor HC-SR04

According to the illustration above, the HC-SR04 Ultrasonic (US) sensor is a 4-pin module with the pin designations Vcc, Trigger, Echo, and Ground. This sensor is quite widespread and used in a variety of applications where it is important to sense objects or measure distance. On the front of the module, two projections that resemble eyeballs serve as the ultrasonic transmitter and receiver. The simple formula from high school, Distance = Speed Time, is used by the sensor to work.

C. LED

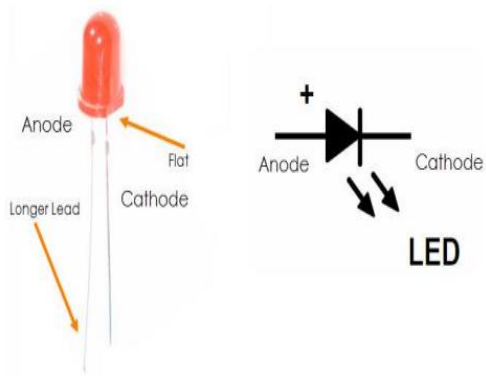

Fig. 4 LED

A semiconductor light source called a light-emitting diode (LED) produces light when current passes through it. Recombining electrons and electron holes in the semiconductor results in the release of energy in the form of photons. The energy needed for electrons to bridge the semiconductor's band gap determines the colour of the light, which corresponds to the energy of the photons. A layer of light-emitting phosphor or several semiconductors can be used to create white light on a semiconductor device.

The first LEDs released low intensity infrared (IR) light when they first became usable electrical components in 1962. Remote-control circuits, such as those used with a variety of consumer gadgets, use infrared LEDs. The early LEDs that produced visible light were dim and only produced red light. Modern LEDs have strong light output and are available in the visible, ultraviolet (UV), and infrared spectrums.

D. Buzzer

Fig. 5 Buzzer

A buzzer or beeper is an audio signal maybe mechanical, electromechanical or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

E. Battery Connector

Fig. 6 Battery Connector

The connector is a component that connects electrical circuits. The majority of battery packs require many connectors. The mechanical and electrical components that link the battery with the PDA or other electronic device are both found on the primary battery connection.

➢ *Simulation*

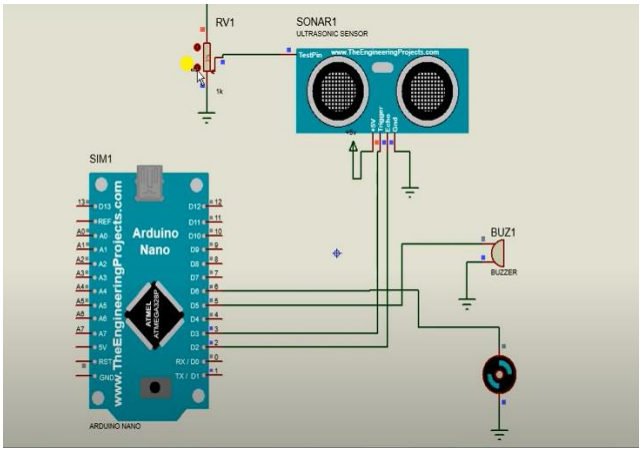

Fig. 7 Simulation

➢ *Final project*

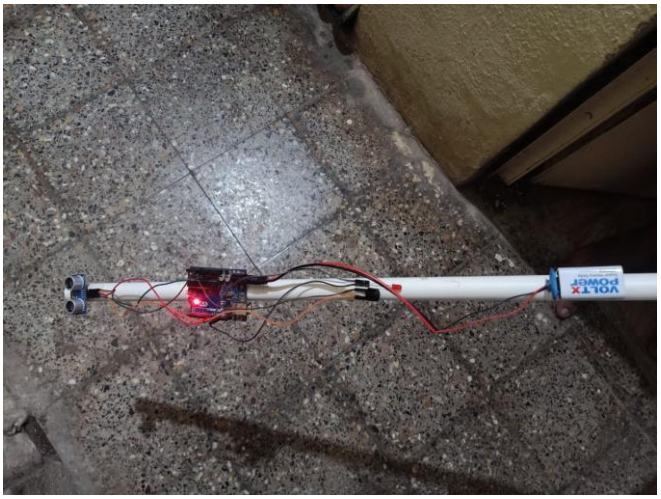

Fig. 8 Final Project

V. CONCLUSION

- A prototype of the Blind Walking Stick, which can be used to guide the blind, has finally been created. Its goal is to address the issues that blind people deal with on a daily basis. Additionally, the system takes precautions to guarantee their safety. The goal of this project is to make it easy for all blind individuals to walk wherever they wish. It was done to make it easier for the blind to manoeuvre in front. It is employed to assist blind persons with disabilities in moving more easily and safely.
- This system provides an obvious quick response time, low cost, dependable, portable, and robust option for navigation. The system is lightweight despite being hardwired with sensors and other parts. The range of the ultrasonic sensor can be extended and a method for calculating the speed of approaching obstacles can be implemented by providing wireless connectivity between the system's components, which will also improve other parts of the system. People who are blind or visually handicapped in all developing nations were our primary priority when creating such an empowering solution.

REFERENCES

[1]. Dey, Naiwrita, et al. "Ultrasonic sensor based smart blind stick." *2018 international conference on current trends towards converging technologies (ICCTCT)*. IEEE, 2018.
[2]. Nada, Ayat A., Mahmoud A. Fakhr, and Ahmed F. Seddik. "Assistive infrared sensor based smart stick for blind people." *2015 science and information conference (SAI)*. IEEE, 2015.
[3]. Chen, Liang-Bi, et al. "An implementation of an intelligent assistance system for visually impaired/blind people." *2019 IEEE International Conference on Consumer Electronics (ICCE)*. IEEE, 2019.
[4]. Agrawal, Mukesh Prasad, and Atma Ram Gupta. "Smart stick for the blind and visually impaired people." *2018 second international conference on inventive communication and computational technologies (ICICCT)*. IEEE, 2018.
[5]. Kunta, Vanitha, Charitha Tuniki, and U. Sairam. "Multi-functional blind stick for visually impaired people." *2020 5th International Conference on Communication and Electronics Systems (ICCES)*. IEEE, 2020.
[6]. Dhanuja, R., F. Farhana, and G. Savitha. "Smart blind stick using Arduino." *International Research Journal of Engineering and Technology (IRJET)* 5.03 (2018).
[7]. Sharma, Sharang, et al. "Multiple distance sensors based smart stick for visually impaired people." *2017 IEEE 7th Annual Computing and Communication Workshop and Conference (CCWC)*. IEEE, 2017.
[8]. Saquib, Zeeshan, Vishakha Murari, and Suhas N. Bhargav. "BlinDar: An invisible eye for the blind people making life easy for the blind with Internet of Things (IoT)." *2017 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT)*. IEEE, 2017.