DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
College of Engineering and Technology
SRM Institute of Science and Technology

MINI PROJECT REPORT

EVEN Semester, 2022-2023

Lab code & Sub Name : **18ECO108J- Embedded system Design using Arduino**

Year & Semester : 3/VI

Project Title : **SMART DEVICE FOR BLIND PEOPLE TO AVOID ACCIDENTS**

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Particulars	**Max. Marks**	**Marks Obtained**
		Name:
		Register No :
Program and Execution	20	
Demo verificati on &viva	15	
Project Report	05	
Total	**40**	

SMART DEVICE FOR BLIND PEOPLE TO AVOID ACCIDENTS

OBJECTIVE:

Protecting blind people from accidents using ultrasonic sensors and buzzers.

ABSTRACT:

Motion detection has become one of the great areas of research in the world. Many activities are carried out in the presence of motion. One of the research focuses has been the use of Arduino Uno microcontroller, Ultrasonic sensor,passive infrared sensor and many others to sense and measure distances. The goal is to measure and monitor human activity remotely, and use less manpower as much as possible. This study aimed at designing a sensor that can easily measure how far the object is, monitor change of distances as the object approaches and display the results in the Liquid Crystal Display (LCD), give a light coded signal and a sound alarm. The hardware utilized included the Arduino Uno on a breadboard interfaced with LCD, LEDs, Buzzer and Ultrasonic sensor.

The program to run the circuit was developed using Arduino IDE and stored in the memory of the Arduino microcontroller. The study demonstrated that the designed sensor could be used to accurately determine the position of an approaching object and display the distance readings on the LCD. Simultaneously the sensor displays visual LED signals set and color coded as, for instance, distances less than 150 cm, 70 cm and 40 cm corresponding to Green, Blue and Red LED lights respectively, while at the same time producing sound signals and sound buzzer. Thus, this method of distance sensing and measurement is efficient and assures measurements of small distances precisely. This distance sensing and measurement system can get wide applications where proximity detection is required e.g. in industries and traffic departments.

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INTRODUCTION:

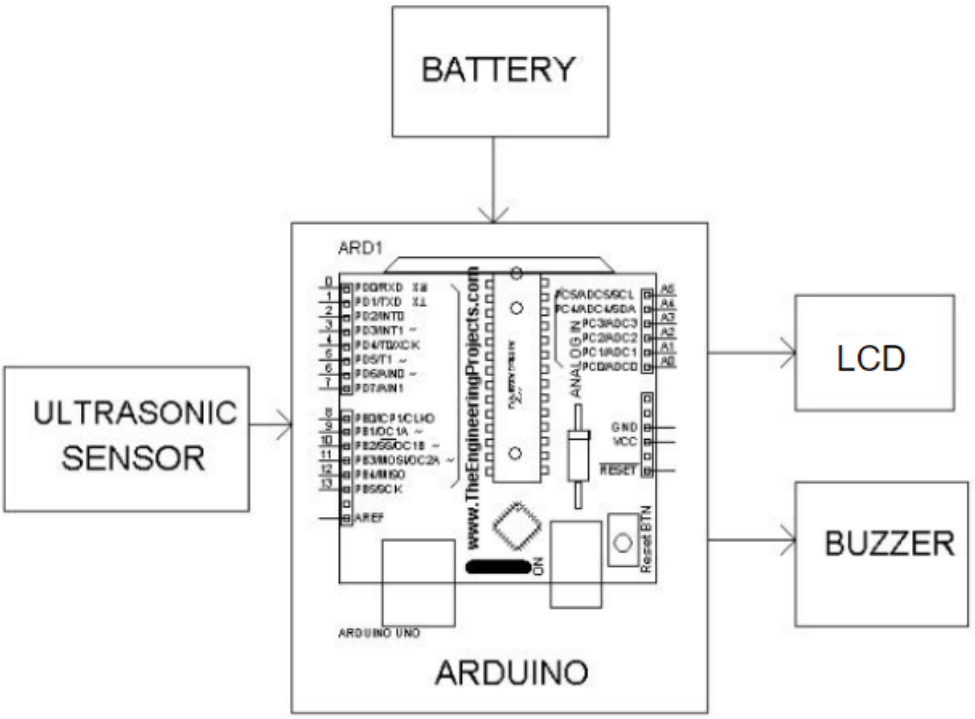
Population increase, lifestyle changes and economic development has led to increase in human activity and hence high demand of manpower and especially in cities all over the world [1,2]. For example there is increasing need to employ security officers at the gates to monitor the movement of people which might be intruders [3,4], traffic police in highways to monitor traffic, caregivers in homes for the old or sick [5], automatic doors [6], washing [7], wireless Sensor-Based Driving Assistant for Automobiles [8,9,10,11,12] and many others. Use of humans to sense motions and other human activities is prone to human error and limitations. Some security officers have been found in a serious case of corruption [13], theft from the company and institutions since some guards end up taking some of the company's material home and of which it has led to the fall of various companies like Kenya textile and Mumias sugar company, his among other reasons have necessitated automated sensing that could be recorded for future reference

and also remote. Samuel Bango [15] was the first person to invent a motion detector whereby he came up with a burglar alarm in the early 1950s. Doppler Effect is the main principle upon which Bango [15] motion detector is based. Majority of motion detectors today still employ the same principle for example, use of the Doppler Effect to sense gestures [16]. Other sensors include IR sensors [17,18], ultrasonic sensors [19,20,21] and microwave sensors [22] which by the change in the frequencies they emit they are able to sense motion.

HARDWARE/SOFTWARE REQUIREMENTS:

- Arduino Uno
- Servo meter
- Wires
- Source Code

CONCEPTS/WORKING PRINCIPLE



APPROACH/METHODOLOGY/PROGRAMS:

Uno was fixed to the breadboard and the jumper wires were connected as illustrated in the following sections. One jumper wire from the 5-volt pin on the Arduino was connected to the bottom channel of the breadboard. Another jumper wire from a ground pin on the Arduino was connected to the upper channel of the breadboard. Piezo Buzzer has two terminals. Positive and negative.

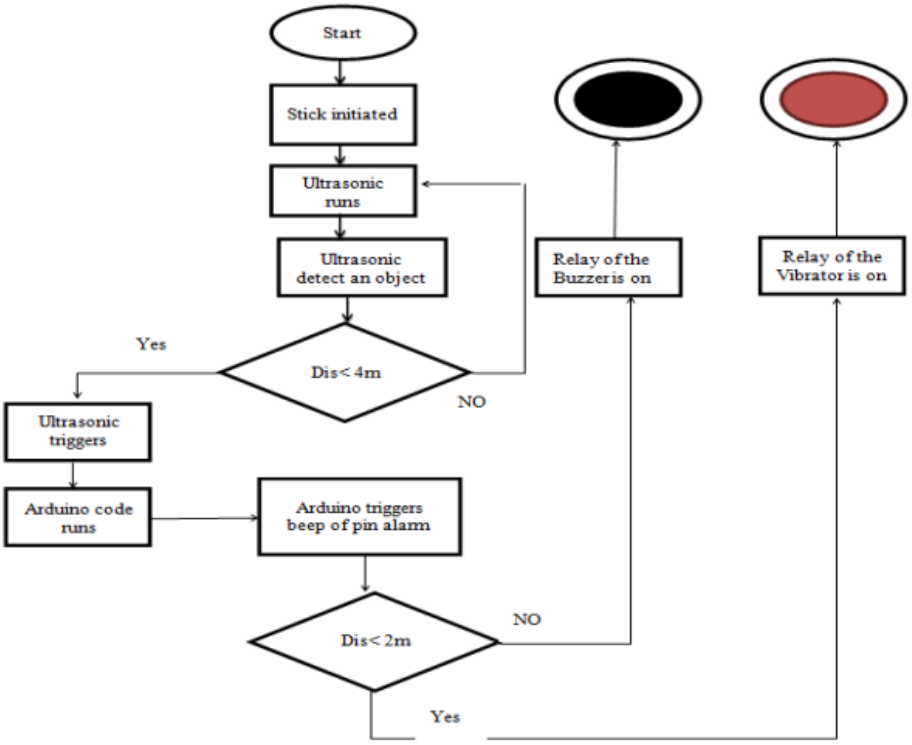
The positive terminal was connected to pin 13 at the Arduino while the negative part was interfaced with 330 Ohms resistor and connected to the lower channel of the breadboard. The ultrasonic sensor has four pins : Vcc, Trig, Echo and ground. Echo was connected to pin number 11 while Trig was connected to pin number12 in the Arduino Uno. Vcc was connected to the upper channel while the Ground (Gnd) to the lower channel of the breadboard.

The study utilized three LEDs: one red, 1 blue and one green. LED1 was connected to pin number 8 and LED2 to pin number 7, LED3 to pin number 6. The negative terminal was interfaced with the 330 Ohms resistors to the lower channel of the breadboard as shown in figure 5. The jumper wires connected to the LEDs were connected to the lead on the right, while the left lead of the LED connected to the ground channel via a 330-ohm resistor. LCD has 14 terminals which are connected to the Arduino as: Pin 12 to Pin 2, Pin 11 to pin3, Pin 5 to pin 4, Pin 4 to pin 5, Pin 3 to pin 9, Pin 2 to pin 10 as shown in figure 5.

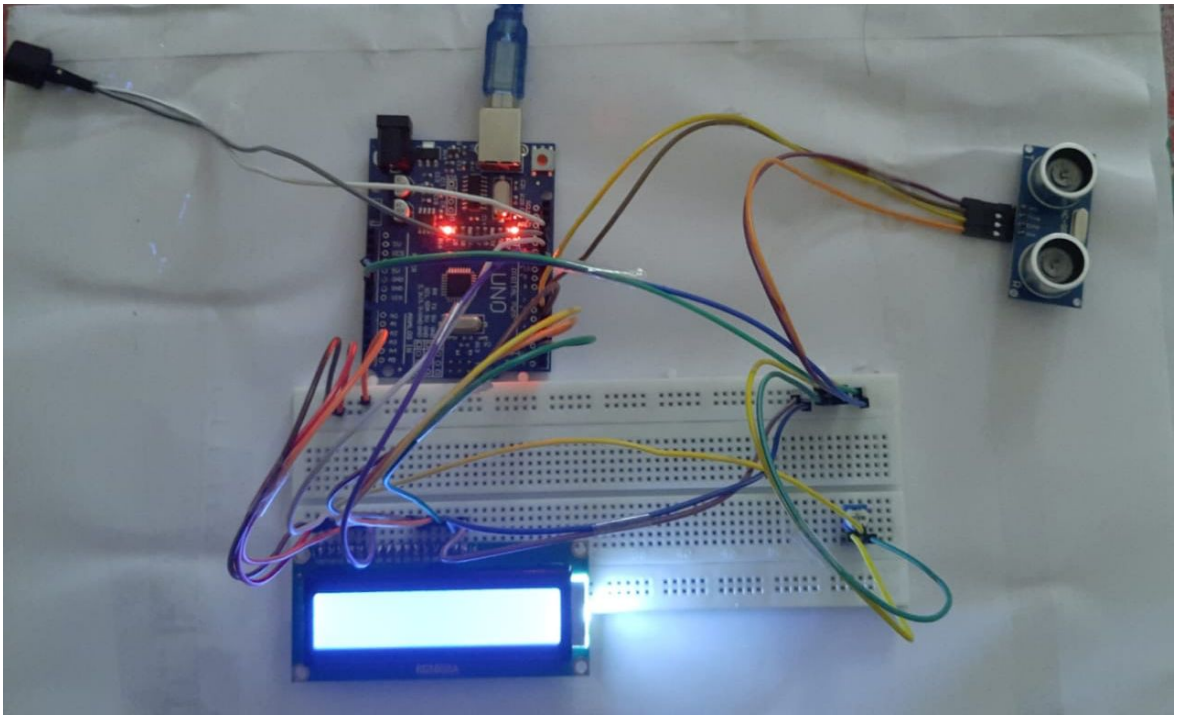
The 5V pin from the Arduino was connected to the positive line on the breadboard. Also, the ground pin from the Arduino was connected to the negative part of the breadboard. For the reset of the intensity of the LCD screen, a 10kΩ potentiometer was interfaced to the breadboard. Potentiometer was connected to the breadboard, the positive terminal to the positive pin and the negative terminal to the ground pin to the ground pin .

The code was generated using the computer with the appropriate Arduino IDE program and sent to the Arduino microcontroller for running the circuit. The data for the study were collected and compared to the actual distance. The object from whose motion was to be detected was moved towards the sensor and the display of the distances to the LCD screen was observed. The displayed distances were compared from the actual distances from the meter rule.

FLOWCHART:


Start
Stick initiated
Ultrasonic runs
Ultrasonic detect an object
Dis< 4m
Yes
NO
Ultrasonic triggers
Arduino code runs
Arduino triggers beep of pin alarm
Dis< 2m
NO
Yes
Relay of the Buzzer is on
Relay of the Vibrator is on

OUTPUT:



CONCLUSIONS:

This study sought to first design a motion detector to detect approaching objects and raise a light (from an LED) and a sound alarm (from a sound buzzer). To achieve this, the components that include the Arduino Uno, resistors, LEDs, buzzer, LCD and ultrasonic sensor were fixed to the breadboard and connected as described . A jumper wire was connected from the 5 volts port from the Vcc port in the microcontroller chip to the positive channel of the breadboard. Another cable was grounded to the negative terminal of the breadboard from the GND port of the chip. Protecting blind people from accidents using the ultrasonic sensor and buzzer is done.

REFERENCES:

www.physicselectronics.in
www.ssmmd.in