CHAPTER 01

INTRODUCTION

1.1 MOTIVATION FOR SELECTION OF PROJECT

For this project, the main reason for our motivation was the ongoing pandemic. In this situation people are following social distancing norms and avoiding touching random surfaces in social places like any button, latch, walls, benches, etc.

In today's day and age Doorbells are an important part of every house. It is much easier to press a single button to call the person in the house than banging the door continuously. We take this tech a step further by including a sensor-based system which gives more ease to the person outside the house . With the help of this tech, the person outside only needs a flick of hand in front of the sensor and the circuit will detect it and ring the bell.

That's why we have come forward with the idea of the touchless doorbell. We have worked in small steps, and in some long and focused sessions towards this goal. Small steps will take you far. Working slowly, consistently, and diligently was our strategy. And that's what we have adhered to.

1.2 IMPORTANCE OF TOPIC SELECTED:

It gives us a great pleasure to introduce "Touch less doorbell" as the Second year project The project is based on a object detecting using a lR sensor. A lR sensor is a consists of an lR LED and photodiode. Together they are called as Photo - Coupler or Opto-Coupler. Touch less door bell is consist of lR LED ,photo diode, resistors, , potentiometer,general LED with a buzzer, etc. Such a way that whenever the any object comes close to the lR sensor, the buzzer starts beeping and the LED glows. This concept of touch less door bell is very useful as a fire engines, Railroad crossing, School bells and Alarm in industrial plants etc. This system is suitable for securing door.   When some infected person presses the button the virus hold on that button and when a non-infected person touch this button the virus spread to that person. We can avoid this danger by using the touchless doorbell.The existing doorbell can convert to a touchless doorbell. Touchless automation is the next step to ensure safety of each family members and loved ones. To avoid the spread of communicable disease through contact.Touchless Doorbell is a unique idea and a next step towards safer future.

1.3 OBJECTIVE:

1)To find an appropriate sensor for detection of human.

2) To design the touchless door-bell using the selected sensor.

3) To deploy the touchless door-bell.

4) To test the working of the touchless door-bell.

1.4 TECHNICAL AND COMMERCIAL FEASIBILITY OF THE PROJECT

Algorithm

Algorithm for the Touchless doorbell is simple and elegant. The microcontroller follows steps in order to be

used in the touchless doorbell. The algorithm consists of eight steps.

Algorithm for the working of the touchless doorbell is given below:

1. Power On, start the doorbell.

2. Set the LED and Speaker pins to LOW. And set the trigger pin of the sensor to low.

3. Set the trigger pin of the sensor HIGH for 10 micro seconds and then set it LOW.

4. Detect the echo pin of the ultrasonic sensor.

5. Calculate time for detection on Echo pin pulse.

6. Calculate distance between the sensor and object using formula distance = (speed of sound * time) / 2

7. Send a signal to the Buzzer from Sensor if the distance measured is between 0 – 20 cm.

8. Interrupt the input of sensor till the bell is ringing.

9. Loop from steps 2 – 7 until the power is turned off.

1.5 PROJCET PLANNING

To make the project task easy and for work distribution, the project is divided
 into parts:
 1.   Implementation on bread board
 2.   Final implementation of project

| Time Span	Working
17/3/2022 to 19/3/2022	Group member selection and started searching various domains for project
1/4/2022 to 4/4/2022	Finalize project topic and studied various papers and made abstract for 1st review.
6/4/2022 to 10/4/2022	Go throw actual algorithm and studied concept of each step in detail.
19/4/2022 to 22/4/2022	Started learning basics of Multisim programming language.
27/4/2022 to 05/5/2022	Started working on project
5/5/2022 to 12/5/2022	Completed Project with breadboard implementation
1/3/2018 to 31/3/2018	Working on hardware interfacing and testing

CHAPTER 02

GENERAL PROJECT DESCRIPTION

2.1 GENERAL PRINCIPLE OF PROJECT

"Implementation of algorithm for touchless sensor" Using algorithm we are designing a secured system for transmission and reception of data using Multisim.

2.2 BLOCK DIAGRAM OF THE PROJECT
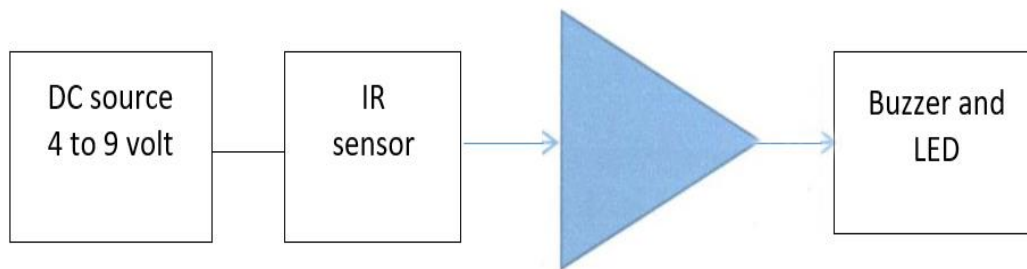
2.2.1 DESCRIPTION OF BLOCK DIAGRAM

Battery: Dc source 9v battery is used

IR Sensor: Photo diode Sensor is used for detection of human

IC LM 358 : It's a dual op-amp IC

Buzzer : Piezo electric 9v buzzer

LED : Red led

CHAPTER 03

SOFTWARE DESIGN ASPECTS

3.1 MULTISIM IMPLEMENTATION

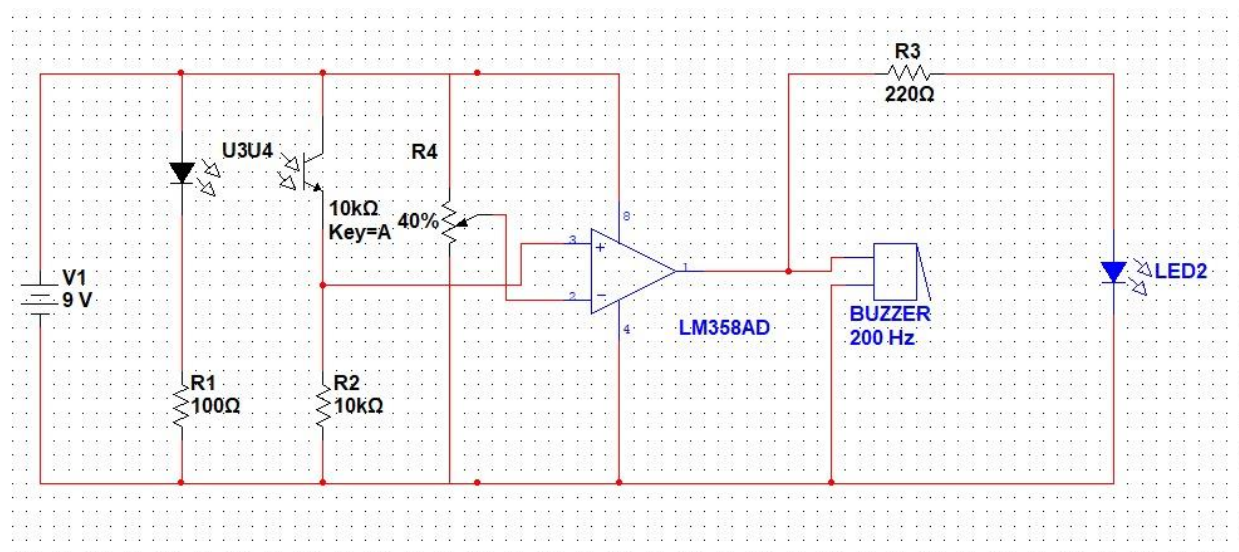**Fig 2:Multisim circuit**

CHAPTER 04

HARDWARE DESIGN ASPECTS

4.1.1 Hardware

PCB Connection: A zero printed circuit board, or PCB, is used for Electronics and Communication support and"electrically connect electronic components using conductive pathways, tracks or signal traces etched from copper sheets laminated to a non-conductive substrate. The PCB is printed circuit board having circuit made with cooper layer on the plate there are various steps to design a PCB for that the basic thing required is circuit. So, the circuits required for the system

Resistor: A resister is a passive two terminal electrical component that implements electrical resistance is a circuit element. The current through a resister is in direct proportion to the voltage across the resister's terminals. Thus, the ratio of the voltage applied across a resistor's terminals to the intensity of current through the circuit is called resistance. V=lR Where is the current through the conductor in units of amperes , V is the potential difference measured across the conductor in units of volts, and R is the resistance of the conductor in units of ohms. More specifically, Ohms law states that the current I flowing through the conductor is directly proportional to the potential difference (v) across its ends provided the physical conditions like temperature, strain etc.

Transmitter: An lR LED, also known as lR transmitter, infrared rays in the range of 100 nm wavelength. arsenide or aluminum gallium arsenide. They, along sensors. is a special purpose LED that transmits Such LEDs are usually made of gallium with lR receivers are commonly used as IR tED The appearance is same as a common LED. Since the human eye cannot see the infrared rad"iations, it is not possible for a person to identify whether the lR LED is working or not unlike a common LED. To overcome this problem, the camera on a cell phone can be used. The camera can show us the lR rays being emanated from the lR LED in a circuit.

Features:
- High Reliability .
- Excessive radiant intensity .
- Forward voltage is low
- Having lead spacing of 2.54mm .
- Maximum wavelength is 940nm

4.1.2 INTRODUCTION

Infrared technology addresses a wide variety of wireless applications. The main areas are sensing and remote controls. In the electromagnetic spectrum, the infrared portion is divided into three regions: near infrared region, mid infrared region and far infrared region. The wavelengths of the regions and their applications are shown below. Near infrared region - 700 nm to 1400 nm - lR sensors, fiber optic Mid infrared region- L4OO nm to 3000 nm- Heat sensing Far infrared region - 3000 nm to I' mm - Thermal imaging The frequency range of infrared is higher than microwave and lesser than visible light for optical sensing and optical communications, photo optics technologies are used in the near infrared region as the light is less complex than RF when implemented as a source of signal Optical wireless communication is done with lR data transmission for short range applications. An infrared sensor emits and for detects infrared radiation to sense is surroundings. The working of any lnfrared sensor is governed by three laws: Planck's Radiation law, Stephen - Boltzmann law and Wien's Displacement law, Planck's law states that every object emits radiation at a temperature not equal to 00K". Stephen Bottzmann law states that "at all wave lengths, the total energy emitted by a black body is proportional to the fourth power of the absolute temperature. According to Wien's Displacement law, "the radiation curve of a black body for different temperatures will reach its peak at a wavelength inversely proportional to the temperature" The basic concept of an lnfrared Sensor which is used as Obstacle detector is to transmit an infrared signal, this infrared signal bounces from the surface of an object and the signal is received at the lnfrared receiver. But there are five basic elements used in a typical infrared detection system an infrared source, a transmission medium, optical component, infrared detectors or receivers and signal processing lnfrared lasers and lnfrared LED's of specific wavelength can be used as infrared sources. The main types of media used for infrared transmission are vacuum, atmosphere and optical fibers. Optical components are used to focus the infrared radiation or to limit the spectral response.

4.1.3 TECHNICAL SPECIFICATIONS

Sr No.	Components	Value	Quantity
1	IC	LM358	1
2	PCB Board	-	1
3	IR Transmitter Receiver Pair	-	1
4	Buzzer	-	1
5	LED	-	1
6	Variable Resistor	10k ohm	1
7	Resistor	100ohm, 220ohm, 10K	3

4.1.4 PIN COFIGURATION

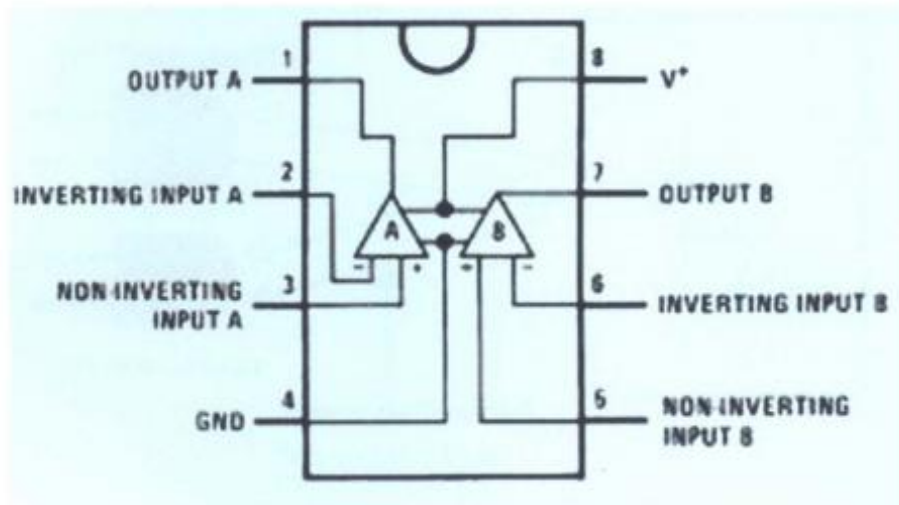The pin diagram of 1M358 lC comprises of 8 pins, where .

Pin-1 and pin-7 are o/p of the comparator

Pin-2 and pin-6 are inverting i/p supply

Pin-3 and pin-5 are non-inverting i/p supply

Pin-4 is GND terminal

Pin-8 is VCC+

LM358 IC

4.1.5 TOTAL COST OF PROJECT

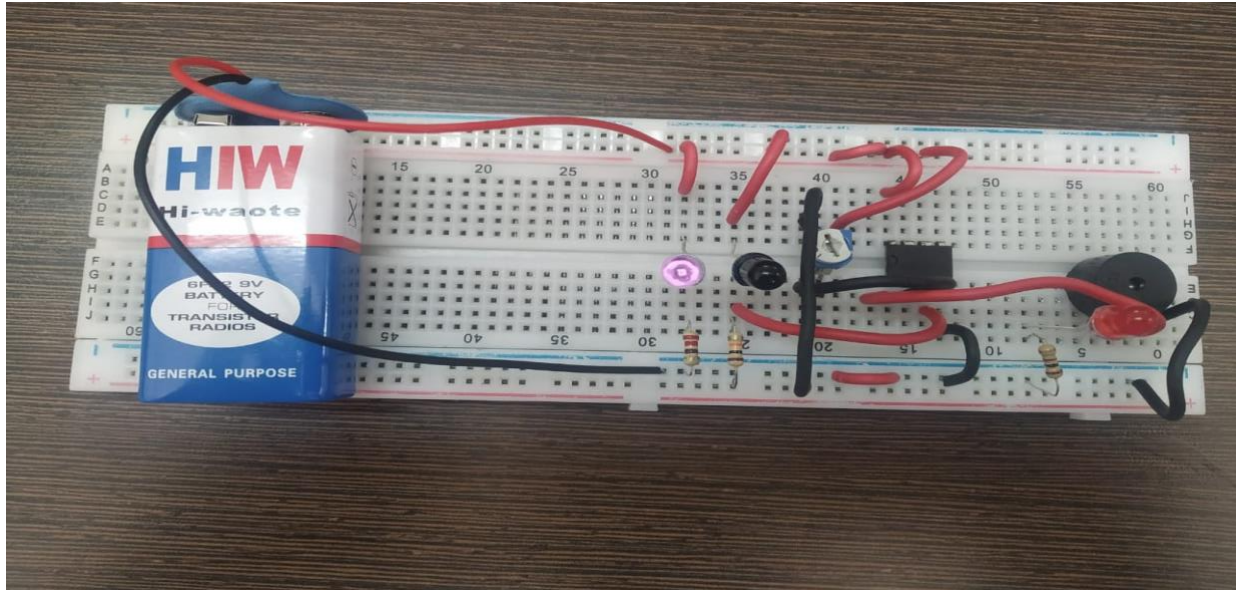| Sr no.	Component Name	Quantity	Price
1	IC	1	10 rs
2	PCB BOARD	1	40 rs
3	IR TRANSMITTER RECEIVER PAIR	1	15 rs
4	BUZZER	1	15 rs
5	LED	1	2 rs
6	VARIABLE RESISTOR	1	5 rs
7	RESISTOR	3	Per 1rs
	Total cost		**90 rs/-**

CHAPTER 05

PROJECT TESTING

5.1 TESTING

CHAPTER 06
RESULT & CONCLUSION

6.1 ADVANTAGES:-

- The house owner can open the door very quickly
- lt is very helpful for short people
- Save time for searching doorbell switch
- Save electricity
- Save manpower

6.2 DISADVANTAGES:-

- lt is very expensive.
- lf the any components is damage then it is does not work\

6.3 APPLICATIONS:-

Some general applications of the touch less doorbell system are

- Fire engines

- In telephone

- Railroad crossing

- School bells

- Alarm in industrial plants etc.

6.4 CONCLUSION:-

There are five basic elements used in a typical infrared detection systems an infrared source, transmission medium, optical components infrared detectors or receivers and signal processing. Infrared lasers and Infrared LED's of specific wavelength can be used as infrared sources. The three main types of media used for infrared transmission are vacuum, atmosphere and optical. Fibers, Optical components are used to focus the infrared radiation or to limit the spectral response. Optical lenses made of Quartz, Germanium and Silicon are focus the infrared radiation. Infrared receivers can be photodiodes, phototransistors are some important specifications of infrared receivers are photosensitivity, directivity and noise equivalent, power Signal processing is done by amplifiers as the output of infrared detector is very small.

6.6 FUTURE SCOPE:-

- The future scope of the product is we can add a system which composed of the Doorbell interfaced with Raspberry

- Its will access registered faces of family members,otherwise it will send the photograph of intruder to Family members.

CHAPTER 07

REFERENCES

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