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"Electronic jacket for women's safety"

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for the VI Semester Mini-Project - 18ECMP68 for the award of degree of

Bachelor of Engineering

In

Electronics & Communication Engineering

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CERTIFICATE

Certified that the Mini Project Work entitled *"ELECTRONIC JACKET FOR WOMEN'S SAFETY"* is a Bonafede work carried out by RUFINA R F 1GV20EC027,SINDHUJA V C 1GV20EC033,SUNITHA P 1GV20EC042 , in the partial fulfilment for the award of degree of Bachelor of Engineering in *Electronics and Communication Engineering of the Visvesvaraya Technological University,* Belagavi during the year 2022-2023. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. Mini Project report has been approved as it satisfies the academic requirement in respect of Mini Project work **-18ECMP68** prescribed for the Bachelor of Engineering Degree.

08.07.23

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ABSTRACT

From past few years, India has gone through many changes, still women are facing socialchanges, and still women are facing social challenges and are often victims of abuse and violentcrimes. Hundreds and thousands of incidents of physical abuse are happening to women everyday.

The main aim of our project is to provide a message to predefined contacts like parents, friends,media, etc.

So we are keeping forward some ideas to ensure the safety of women by a device that will notonly have a buzzer in it but it can also locate the locations using GPS (Global positioning system) technique and once this buzzer is pressed in case of emergency, it will get the exact location of the victim and then it will be sent to the nearest police station so that police force can take immediate action. This basically involves some measures and techniques like buzzingtool which helps for the women safety.

KEYWORDS: safety system, GPS, GSM, Embedded system, sensors, Buzzer.

CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION:-

: In today’s world with the emergency of latest technologies based on internet things that have come up various attempts and measures can be implemented to ensure women’s safety. Every day we are teaching women to hide themselves or to stay in their limits or to ignore the assaults faced, as a result it has reached at the top level and also these methods are proving to beunproductive. In today's modern society, safety and security have become paramount concerns, especially for women. With the increasing need for innovative solutions to address safety challenges, technology has stepped in to offer practical and effective solutions. One such groundbreaking innovation is the electronic jacket for women's safety. The electronic jacket for women's safety is a revolutionary garment designed to enhance personal safety, empower women, and provide them with a sense of security in their daily lives. This allows women to feel more secure, especially when walking alone or traveling in unfamiliar areas. In case of any potential threat or danger, the jacket can quickly send distress signals to pre-determined contacts or emergency services, providing instant help and support.

Moreover, the jacket incorporates smart sensors that can detect sudden movements or impact. These sensors can identify physical assault or an accidental fall and trigger automatic alerts. This proactive safety mechanism enables immediate response and intervention, potentially preventing harm or offering prompt assistance in critical situations. In addition to its safety features, the electronic jacket is designed with style and comfort in mind. It is available in various colors, styles, and sizes, allowing women to choose a jacket that suits their personal preferences while still benefiting from the added layer of safety it provides. The integration of technology into the jacket's design is done seamlessly, ensuring that it remains inconspicuous and fashionable. The electronic jacket for women's safety represents a significant step forward in leveraging technology to address the pressing issue of personal safety.

1.1 REASON FOR SELECTING THIS PROJECT

The Nirbhaya case in Delhi triggered over the nation was the greatest motivation for our project.

The aim of this project is to develop a self-defense system especially for women to protect themselves from the present day physical harassments.

The basic outline of this project is to secure the women from the present worst situations that are occurring in our society.It consists of a shock circuit and GPS system which helps the women when she stucked in badsituations.

1.2PROBLEM STATEMENT

When the emergency situation occurs then the women cannot protect and operate the smart phones. Also, she cannot be set alert function, when they are in risk situation and immediately they cannot pass and send their locations to the police and members .

1.3 OBJECTIVES

The objectives of this project are:

1. Our main aim of this prototype is to bring the relief to the women who are travellingalone or who is aged and weak of resisting the attacks from going down before theyare able to reach to someone
2. It's ensuring immediate messaging when women is in trouble and it produces the instant electric shock.

1.4 REQUIREMENTS

Hardware components

1. Arduino UNO
2. Customized PCB Shock circuit
3. 2 channels 5 volts
4. Buzzer
5. Battery
6. Copper wire

Software components

1 Arduino IDE

2. GSM SIM 900A

CHAPTER 2

LITERATURE REVIEW

A literature survey or a review in a project is a type of review articles. It is a scholarly paper, which includes the current knowledge findings, as well as theoretical and methodological contributions to a particular topic. Literatures reviews are secondary sources, and do not report new or original experimental work. It is a basis for research in nearly every academic field. Concentrate on the own field of expertise

2.1 LITERATURE SURVEY

Swapnali N.Gadhave [1], Saloni D.kale and Sonali N. Shinde in 05th may 2017 proposed a "Electronic jacket for women safety". In this document system can show exact location to relatives, parents, and friends and track every time interval. Emergency panic button using microcontroller. In this paper panic button is used for protection while emergency situations occurs. AVR microcontroller based wearable jacket for women safety. In this paper unified combination of wearable jacket and mobile technology for safety of women in the society. This system helps to alert family members and people closest to the victim by using buzzer, GPS, GSM module. All in one intelligent safety system for women security .In this paper the authors have reviewed of various existing systems on women safety security. The GPS module tracks the longitude and latitude to trace an exact location of a user and sends the pre-stored emergency message including location to the registered contact numbers. The audio recording module starts the recording of the conversation for five minutes and stored as evidences. The message goes in queue if network problem and send when network gets available. Mobile based women safety application. In this paper some app created to know whether awomen is safe or not? Which indicates the present state of affairs of the woman by touching the option, which also indicates the location of the endangered woman they gave a phone call, videoforwarding, fake calls, and location of the person, first-aid details, and application having the instructions that is the way to use the application.

Madhu baalaji S [2] and S. Malaimagal in 28-02- 2018 proposed an "A study on sexual harassment on women in India ''. This document deals with the study on sexual harassment. Women across the world have tasted all flavors of life; from the glory and respect which she was ascribed in the Vedic period, to the denial and subordination in the post vedic period and finally to the struggle for equality, recognition and survival in the contemporary world. But one thing that has been common throughout these phases is the disadvantaged status of the women .Women have been made to face all kinds of violence , physical abuse, denial of right to live, subordinationand neglect .

Urmilla Pilania, Aishwaraya Nair [3] and Sakshi Arora in 2018 proposed a "women safety based on internet of things (IoT)". This document deals with safety of women. After studying andgoing through various research papers we have come across that safety of women is very much important and especially in rural areas women are really not safe. Women is earlier treated as goddess. But now the same goddess is been exploited each day in some or other place in the world. The status of women has been a matter to various changes from the ancient to medieval times and then to recent times. The world health organization (WHO). In its research states that violence against women has been analyzed and divided the different types of violence against women happening through all the phases of life be it from birth to old age..

Ch. Ganapathi pullaji[4] in 2020 proposed a " Implementation of women self security band" inthis document it deals with the system allows for knowing the exact location of the women who have this device, when the band is tapped and accelerometer, which is at predetermined angle, and then the message is sent automatically to selected contact list. That SMS containing location information in terms of Latitude and Longitude contains a shock mechanism for defense back. It Sends the location to predefined contact numbers in the form of latitude and longitude. When the victim attacks to women that time shock circuit is used to punish the attacker for self-defense.

Manikumar ,balaji VR[5], Nirmala Paramanandham and M Murugan in 2021 proposed a"Guardian device for women – a survey and comparison study in this document it deals with o prevent the attacking on women, so far many safety products are designed. These products are invented based on GPS (Global Positioning Systems) and GSM (Global System for Mobile Communications) modules, IoT (Internet of Things) module, Raspberry Pi model and with some hardware component applications. The authors have reviewed some of the papers based on the women safety. Wasim Akram et al they proposed the device with fingerprint sensor and shockwave generator using at mega 328 microcontroller along with the voice recording ability. Then, the GPS and GSM are used to trace the location and sending emergency messages to contacts. B.Sathyasri et al proposed a work with GPS and GSM which are used to track the exact location and send this location to contacts stored in microcontroller at mega 2560. Neuron stimulator also activated once button is pressed to start a device its application is to give a shock to the attacker along with the buzzer beep sound to alert the surrounding people. D. G. Monished proposeda system based on android application using the ARM controller along with the GSM, GPS, Bluetooth, and RF detector. Working totally based on volume buttons of mobiles as follows if thebutton is pressed on time, then message alert, second if button is pressed two times, then messageand audio and third if the button is pressed long time, then calls to police, message, and Audio. N.Harshitha proposed product with temperature, heart sensor and motion

sensor using Node MCU. Temperature sensor senses the body temperature, Heart sensors sense the pulse rate and motion sensors sense whether the device is in motion or not. The device detects these as soon as it is turned on along with the location. Geetha Pratyusha Miriyala et al proposed a system with raspberry pi model when the device is turned on live streaming recording started and the stun gun with charges an attacker and GPS and GSM for getting the exact location. Sriranjini R et al developed a device using PIC16F877A, GPS, GSM, and Speech circuit. As soon as the device turned on the speech circuit works as follows it designed with two triggers rec, play. When the rec trigger is turned on it starts recording surroundings words. This recording will take place with the MIC fixed in device

Dr. Pallavi G.B [6] and Dr. Latha N R in march 2022 proposed "WOMEN SAFETY GADGET – SAFETY FIRST" in this, After going through numerous research papers we have come across that safety of women is very much important as women's are becoming more and more independent these days and are traveling to the work at late nights which is not safe. Earlier people used to treat women like goddess but now they are being exploited each day in some or other place in the world. All technical papers surveyed gave us a first view on this challenging interplay between computer technology and girl safety. After interacting with women of age group ranging from 17 to 60 years of age and from different places our survey concluded that, most of the women prefer an IoT device and android application which would be available 24*7 and easy to use. In recent years, there is an increase in the rate of crime against women which can be reduced using devices based on IoT. In today's time, every parent's mind will be thinking about safety of their girl child as there's always an increase on women harassments nowadays. In ancient times there was no device to alert or monitor which creates many problems. Hence an IoT device will help to alert, capture images which can be used as evidence in future and also help to send location to our loved ones and also nearby police stations. The survey also led us to study that there were very few or none women today who used an application or any IoT device for their safety. One of the applications built for this purpose was My Safety Pin Mobile Phone Application: Case of Eparticipation Platform for Women Safety in India. As we went through the paper there were certain limitations that restrained the use of this application such as, the app was unable to track the right location, non-functioning of the app in certain locations of India and Inconvenient user interface.

CHAPTER 3

METHODOLOGY

Methodology is the systematic, theoretical analysis of the methods applied to the field of study it comprises the theoretical analysis of the body of methods and principles associated with the branch of knowledge. Typically, it encompasses concept such as paradigm, theoretical model, phase and quantitative or qualitative techniques.

The proposed methodology for electronic jacket for women safety using shock and beep sound involves the following steps:

1. Design and development of the electronic jacket: The first step involves the design and development of the electronic jacket with the necessary electronic components such as a shock circuit beep sound circuit and power source.
2. Integration of shock circuit: The next step is to integrate the shock circuit into the jacket. The circuit will be activated with a push button or remote control and will deliver a small electric shock to the attacker when they touch the jacket.
3. Integration of beep sound circuit: The beep sound circuit will also be integrated into the jacket. It will be activated when the jacket detects any suspicious or unwanted touches and will emit a loud beep sound to alert people nearby.
4. Testing of the electronic jacket: The final step is to test and refine the design of the electronic jacket to ensure that it is effective in protecting women from potential attackers. The jacket will be tested under different scenarios to identify any potential faults or improvements.

In the end, the electronic jacket for women safety using shock and beep sound is a promising solution to protect women from potential attackers. The methodology outlined involves the designdevelopment integration and testing of the jacket which can be further refined to improve its effectiveness.

3.1 BLOCK DIAGRAM

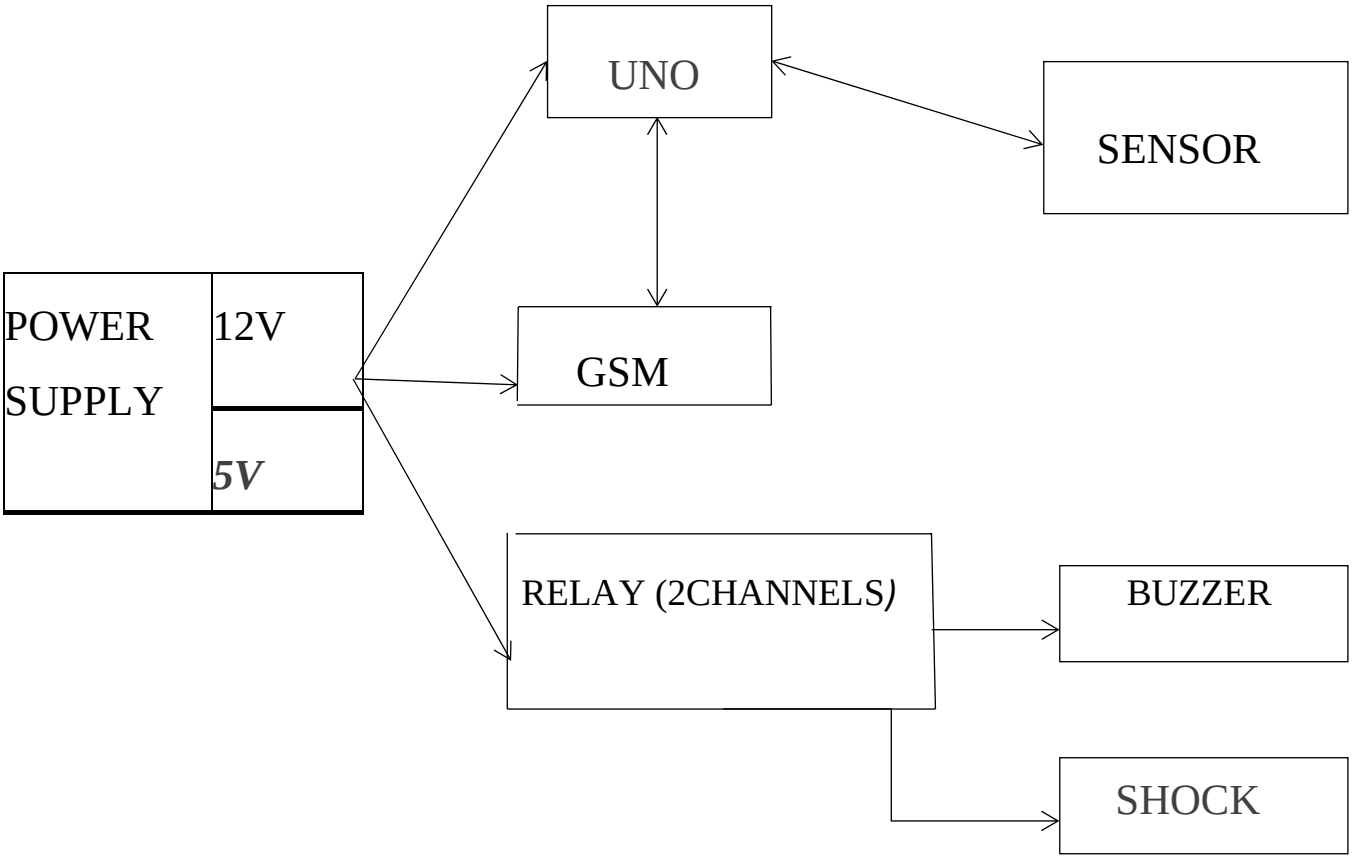

Figure 3.1: block diagram

Here is a block diagram explanation for a women's safety jacket using components such as GSM sensor, buzzer, shock sensor, Arduino Uno, and power supply:

1. Power Supply: This block represents the power supply unit of the safety jacket, which provides electrical power to all the components. It can consist of a rechargeable battery or replaceable batteries.

2. Arduino Uno: This block represents the Arduino Uno microcontroller board, which serves as the main control unit of the safety jacket. It receives inputs from various sensors and controls the activation of safety features.

3. GSM Sensor: This block represents the GSM (Global System for Mobile Communications) sensor It allows the safety jacket to communicate over cellular networks. The GSM sensor can send distress signals, emergency messages, or GPS location data to predefined contacts or emergency services.

4. Buzzer: This block represents the buzzer, an audible alarm device. It can be activated by the main control unit to emit a loud sound, attracting attention and scaring away potential attackers.

5. Shock Sensor: This block represents the shock sensor. It detects sudden movements or impacts on the jacket. When triggered, it sends a signal to the main control unit to initiate appropriate actions.

By connecting these components together in a block diagram, we can visualize the flow of information and control within the women's safety jacket. The power supply provides the necessary electrical power, while the Arduino Uno, as the main control unit, processes inputs from the GSM sensor, shock sensor, and other sensors, activating safety features like the buzzer in case of emergency situations**.**

3.2 CIRCUIT DIAGRAM

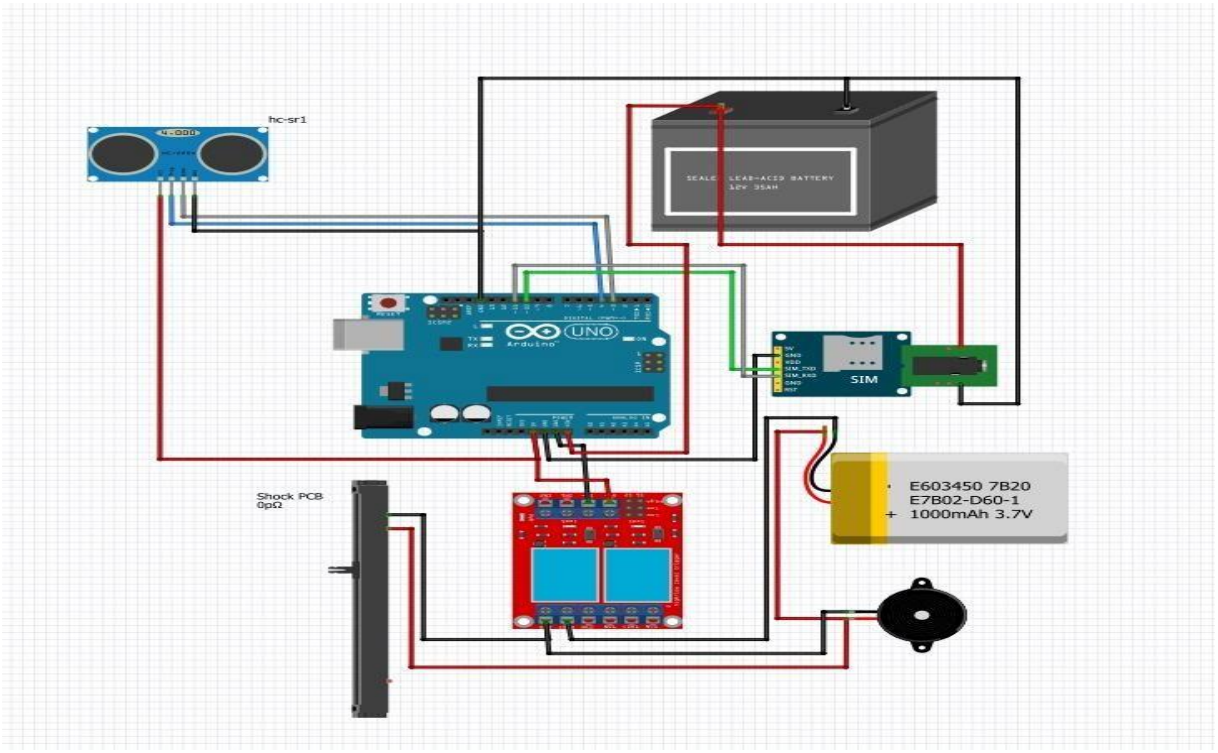

Figure 3.2: circuit diagram

Explanation for the circuit diagram of an electronic jacket for women safety could be as follows:

1. Arduino Uno: The Arduino Uno is the main microcontroller board that will control the overall operations of the electronic jacket.

2. Ultrasonic Sensor: This sensor will be used to detect the presence of any nearby objects or individuals. It will provide input to the Arduino Uno regarding the distance to the nearest obstacle.

3. Shock Module: This module will be responsible for delivering an electric shock when activated. It can be used as a safety measure to deter potential attackers or provide a means of self-defense.

4. Switch: The switch will act as a control mechanism to activate or deactivate the electronic components of the jacket.

5. Battery: it is a rechargeable battery we are using 2 batteries.

1. Connect the VCC and GND pins of the ultrasonic sensor to the 5V and GND pins of the Arduino Uno, respectively. Connect the Echo and Trig pins of the ultrasonic sensor to any available digital pins of the Arduino Uno.

2. Connect the shock module to a digital output pin of the Arduino Uno. Make sure to also connect the GND of the shock module to the GND pin of the Arduino Uno for reference.

3. Connect the switch to a digital input pin of the Arduino Uno. Ensure that the other terminal of the switch is connected to the GND pin of the Arduino Uno.

4. Connect the positive terminal of the battery to the Vin pin of the Arduino Uno, and the GND of the battery to the GND pin of the Arduino Uno.

5. Upload the appropriate code to the Arduino Uno that includes the necessary logic for monitoring the ultrasonic sensor's input, detecting and activating the shock module when required, and responding to the switch's status.

Connect the positive pin of the buzzer to a digital output pin of the Arduino Uno.
2. Connect the negative pin of the buzzer to the GND pin of the Arduino Uno.

Now, whenever a certain condition is met (such as the ultrasonic sensor detecting an obstacle or the switch being activated), you can use the Arduino code to send a signal to the buzzer pin, which will generate sound or an alarm as desired.

CHAPTER 4

IMPLEMENTATION:

The women safety jacket allows immediate response and mainly focuses on two different parts for protecting the women in distress, first is providing instant protection to the user by an alarm sound by using buzzer, along with this shock is provided by the shocker circuit through relay and a message is sent to the nearest police station so that police force can take immediate action.

In this project, the major purpose is to ensure that every women in our society feels safe and protected, so we can tackle the problems to some extent by implementing a real time application and hardware.

Electronic jackets can be one way to enhance women's safety nowadays. The design of such a jacket could include a shock circuit and a beeping sound when activated. Here are the different components that can be used to make the jacket:

Shock Circuit: A shock circuit can be added to the jacket that will deliver a mild jolt to any person who tries to inappropriately touch the wearer. The circuit can be powered by a battery located in the jacket.

Beep Sound: A sound mechanism can be added to the jacket that will emit a loud beep sound when activated. This can be used by the wearer to alert people nearby that she is in trouble.

Control System: A control system can be added to the jacket which will allow the wearer to control the shock and sound mechanisms. For example the wearer can activate the shock circuit when she feels threatened and then activate the beep sound to attract attention and seek help.

Sensors: Sensors can be used in the jacket to detect any unwanted touching. The sensors can be activated based on the pressure and the shock circuit can be triggered when the pressure exceeds a predetermined threshold.

Communication System: A communication system can also be integrated into the jacket in case someone tries to attack the wearer or if the wearer needs help. The communication system can be linked to a smartphone app or a pre-designated emergency contact number.

Overall an electronic jacket with a shock circuit and beep sound can be an innovative solution to address women's safety concerns. It is important to remember that such a jacket should be used as a cautionary measure and not as a substitute for self-defense or other safety measures.

4.1 FLOWCHART:-

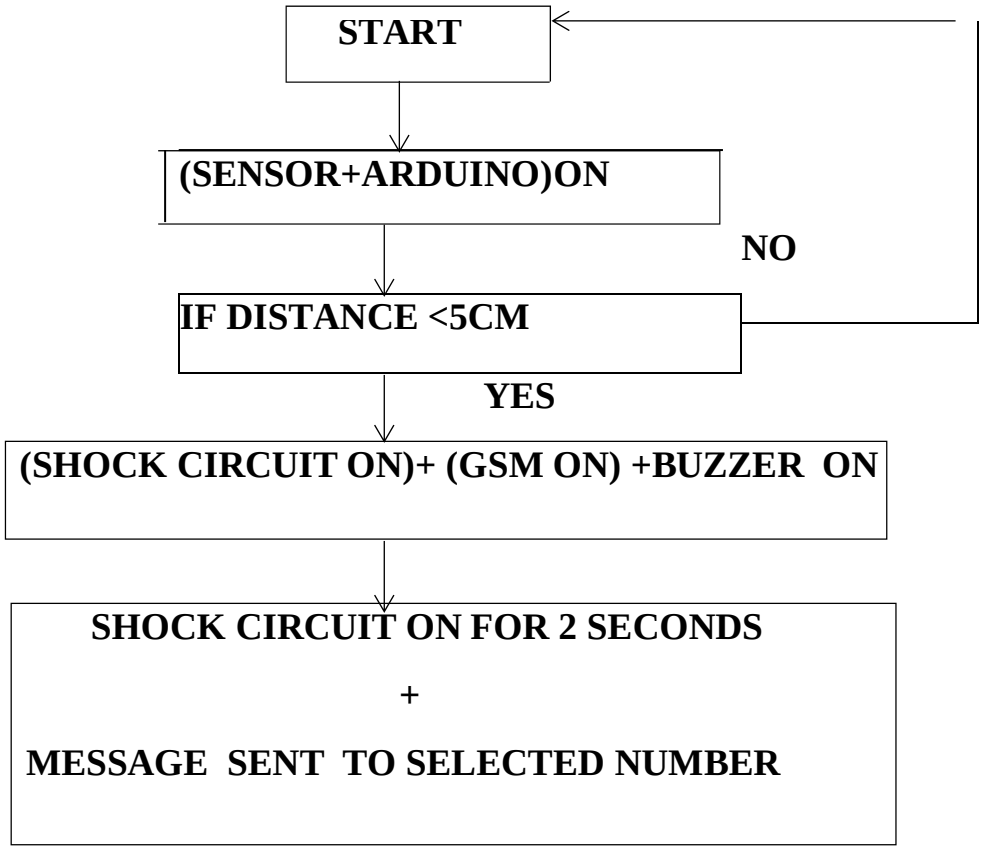

Figure 4.1: Flowchart

4.1 COMPONENTS USED:-

1. Arduino UNO is a microcontroller board based on the ATmega328P. it has 14 digital input/output pin, 6 analog inputs, a 16 MHz ceramic resonator , a USB connection, a power jack ,an ICSP header and a reset button . It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying to much about doing something wrong worst-case

Scenario you can replace the chip or a few dollars and start over again. The Arduinoboard is shown in the figure.

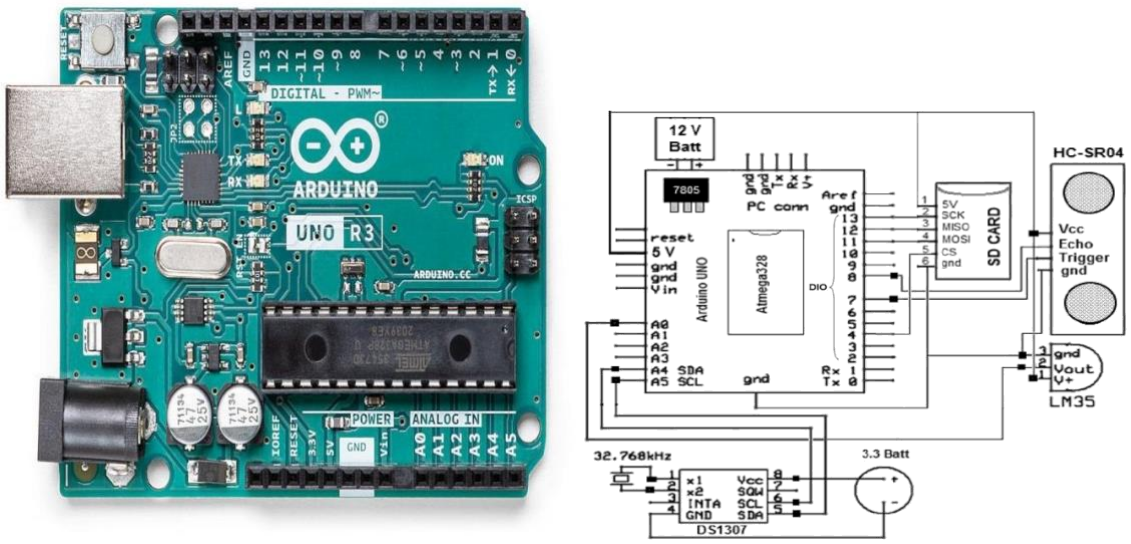

Figure 4.2.: Arduino board

2. PCB shock circuit is an electrical circuit that allows a current to travel along an unintended path with no and very low electrical impedance. This results in an excessive current flowing through the circuit. The opposite of a shock circuit is an open circuit, which is an infinite resistance between two nodes. The role of the PCB is to support the electronic components and to ensure the electrical connections necessary for the operation of the system. PCB cannot perform these functions alone, soldering is necessary to make the mechanical and electrical connections between the components and the tracks of the circuit.

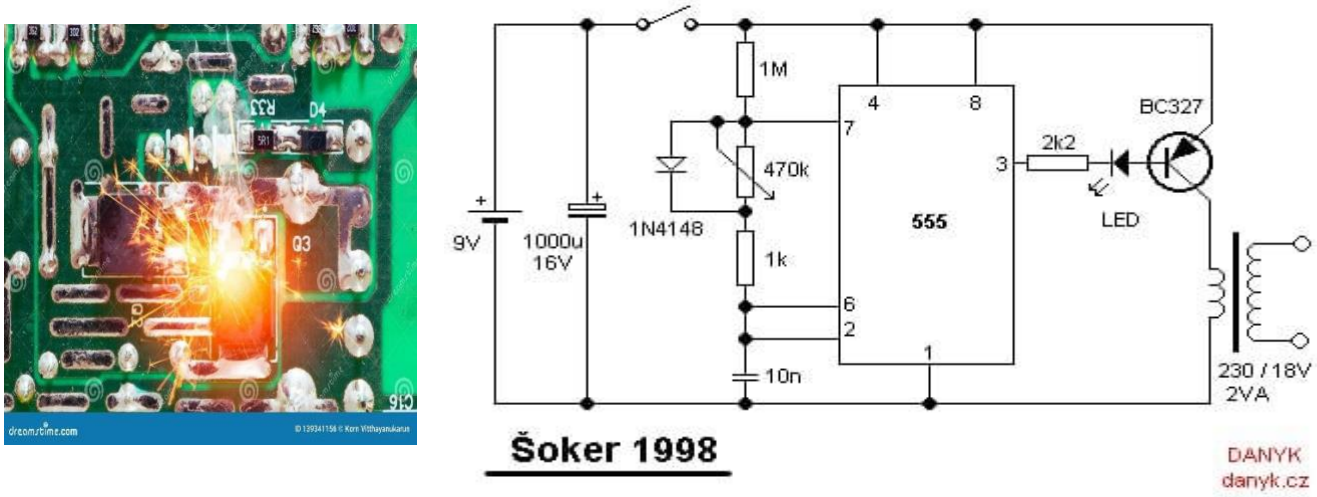

Figure 4.3: PCB shock circuit

3. 2-channel 5V relay is a relay interface board, it can be controlled directly by a wide range of microcontroller such as Arduino, AVR, PIC, ARM and so on. It uses a low level triggered control signal (3.3-5VDC) to control the relay. Triggering the relay operates the normally open or normally closed contacts. It is frequently used in an automatic control circuit. To put it simply, it is an automatic switch to control a high-current circuit with low-current signal .5V relay signal input voltage range 0-5V.

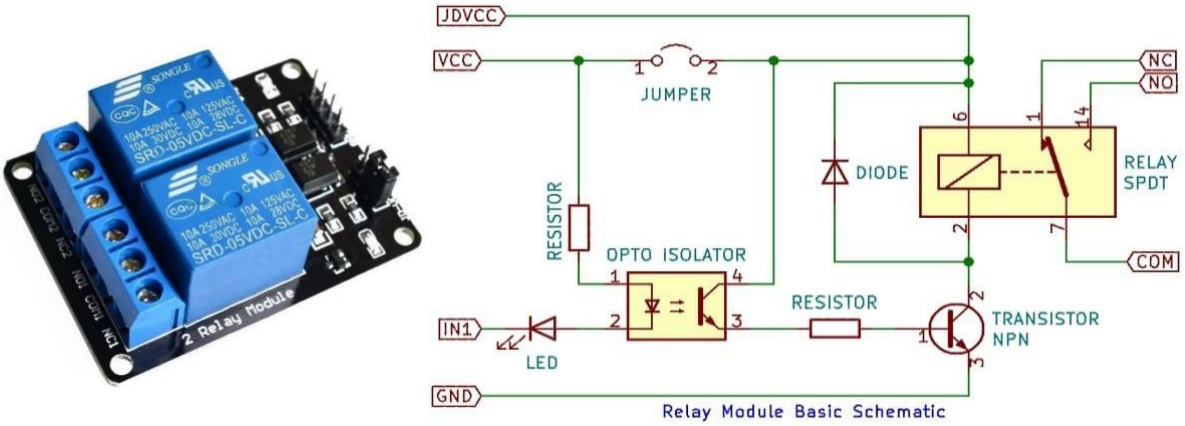

Figure 4.4: 2 channel 5 volt

4. Buzzer is an electronic device. It has circuit being carefully designed in it .when the circuit is completed, the electric current flows through it and externally manifests as the buzzing sound. The circuit is connected to a diaphragm present inside the machine, the diaphragm vibrates frantically, resulting in its sound. In the resting stage, the circuit is broken at the point of application of force. When an external force is enforced to the buzzer such as pressing the buzzer button, the current passes through the circuit and activities the buzzer.

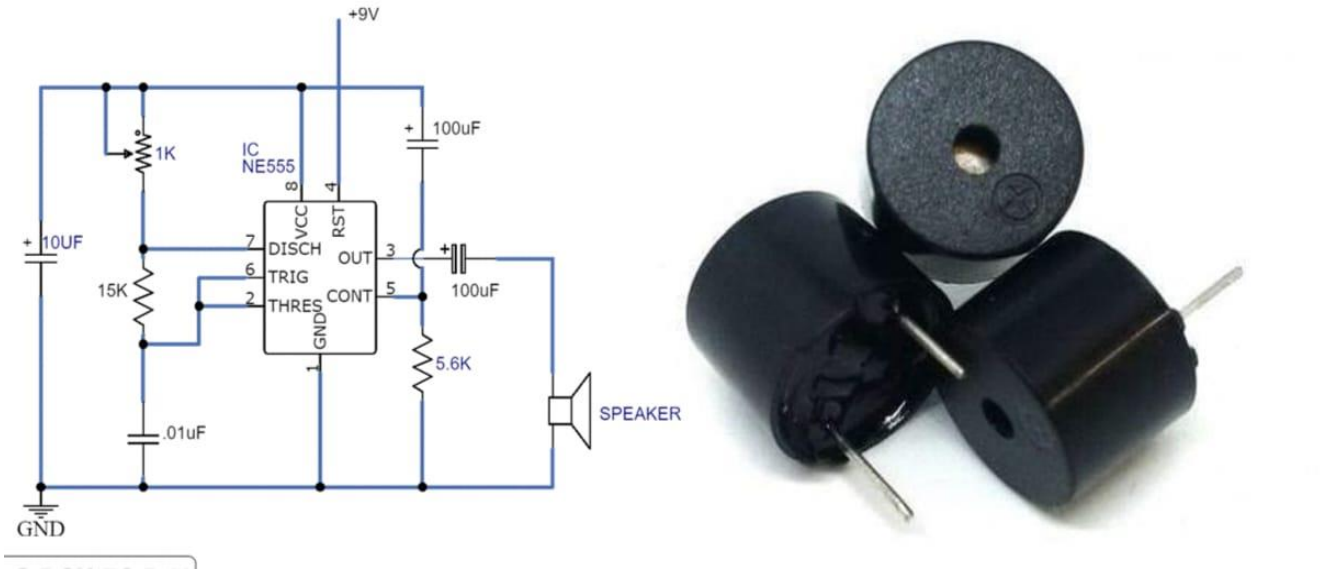

Figure 4.5: buzzer

5. Battery has a cathode or positive plate, and an anode or negative plate. These electrodes must be separated by and are often immersed in an electrolyte that permits the passage of ions between the electrodes. The electrode materials and electrolyte are chosen and arranged so that sufficient electromotive force and electric current can be developed between the terminals of a battery to operate lights, machines or other devices .The active parts of a battery are usually encased in a box with a cover system or jacket that keeps air outside and electrolyte solvent inside and that provides a structure for the assembly.

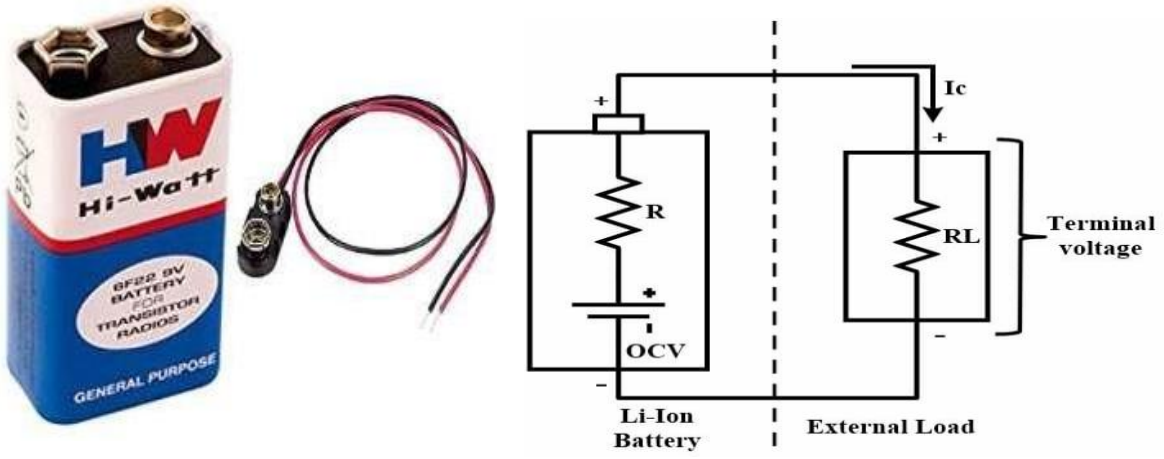

Figure 4.6: Battery

6. Copper wire are very commonly used in the process of supplying electricity as they have a high level of conductivity. Copper comes under the category of transition metals. It is reddish brown in color but its salts often impart a turquoise color. It is highly ductile which means it can been drawn or stretched into wire. Copper has a high thermal and electrical conductivity it is widely used in lots of things like utensils, machinery, roofing, plumbing, electrical devices,electrical wire, etc. Almost 60% of the copper is used in making wires. There are a number of uses of copper wire which makes it an essential metal. Copper wire has the best electrical conductivity after silver.

Figure 4.7: Copper Wire

7. GSM SIM 900A is the smallest and cheapest module for GPRS/GSM communication. It is common with Arduino and microcontroller in most of embedded application. The module offers GPRS/GSM technology for communication with the user of mobile SIM. It uses a 900 and 1800MHz frequency band and allows users to receive/send mobile calls and SMS. The keypad and display interface allows the developers to make the customize application with it. Furthermore, it also has modes, command mode and data mode. In every country the GPRS/GSM and different protocols /frequencies to operate. The module SIM900a looks like a single chip but it has a bunch of features that can help to build almost many commercial applications.

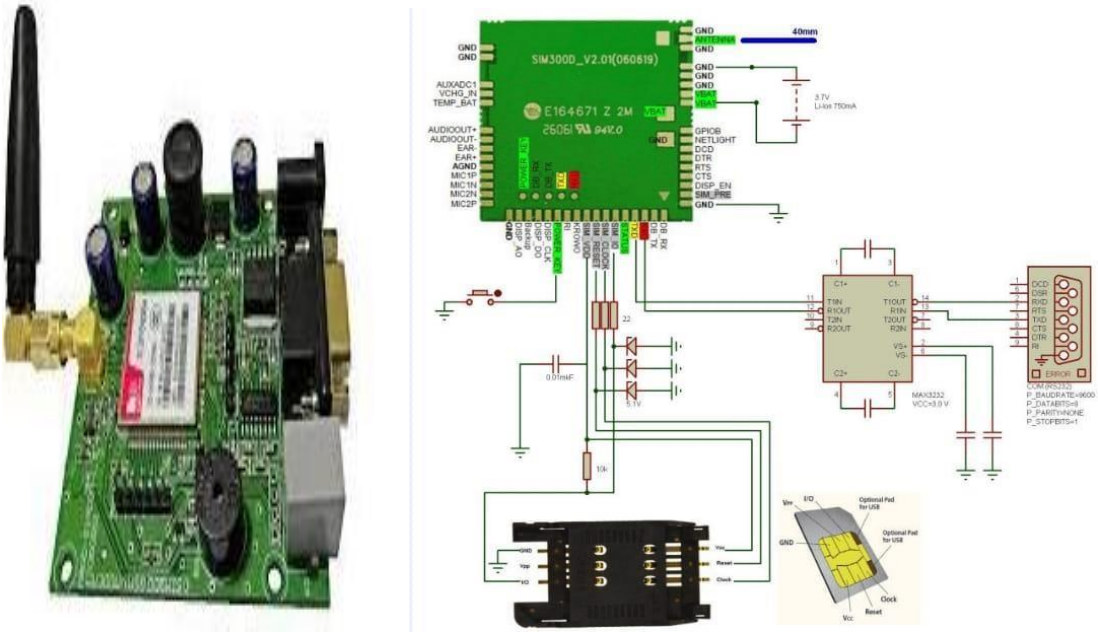

Figure 4.8: GSM SIM 900A

CHAPTER 5

SOURCE CODE:

```
#include <SoftwareSerial.h>

 SoftwareSerial mySerial(11, 10)

      //Ultrasonic sensors

const int trigPin1 = 3; //Ultrsoonic sensor 1const int echoPin1 = 4;

Long duration1;                  //US 1 variablesint distance1;

        const int p1=6; //relay

       Void setup () {

//mySerial.begin(9600); // Setting the baud rate of GSM ModuleSerial.begin(9600);

         pinMode (trigPin1, OUTPUT);pinMode(echoPin1, INP

pinMode (p1,OUTPUT);digitalWrite(p1,LOW); pinMode(p2,OUT

digitalWrite (p2,LOW);

 pinMode (2, OUTPUT);

pinMode (5, OUTPUT);

digitalWrite(2,HIGH); digitalWrite(5,LOW);

pinMode(8, OUTPUT);digitalWrite(8,HIGH);

}
         Void loop () {

         Ultrasound ();

If (distance1 <= 5)

{
```

```
digitalWrite(p1,HIGH);
      Delay (2000);    digitalWrite(p1,LOW);digitalWrite(p2,LOW);
mySerial.println("AT+CMGF=1");//Sets the GSM Module in Text
Delay (100);  // Delay of 1 second
mySerial.println("AT+CMGS=\"+918861711589\"\r"); // Replace x with mobilenumber
delay (100);
mySerial.println("help help");// The SMS text you want to s
        delay (100);
mySerial.println("help help");// The SMS text you want to senddelay(100)
mySerial.println((char)26);// ASCII code of CTRL+Z for saying the end of sms to themodule
delay (100);
}
}
```

5.1 SOFTWARE RESULT

When the touch is far from the ultrasonic sensor

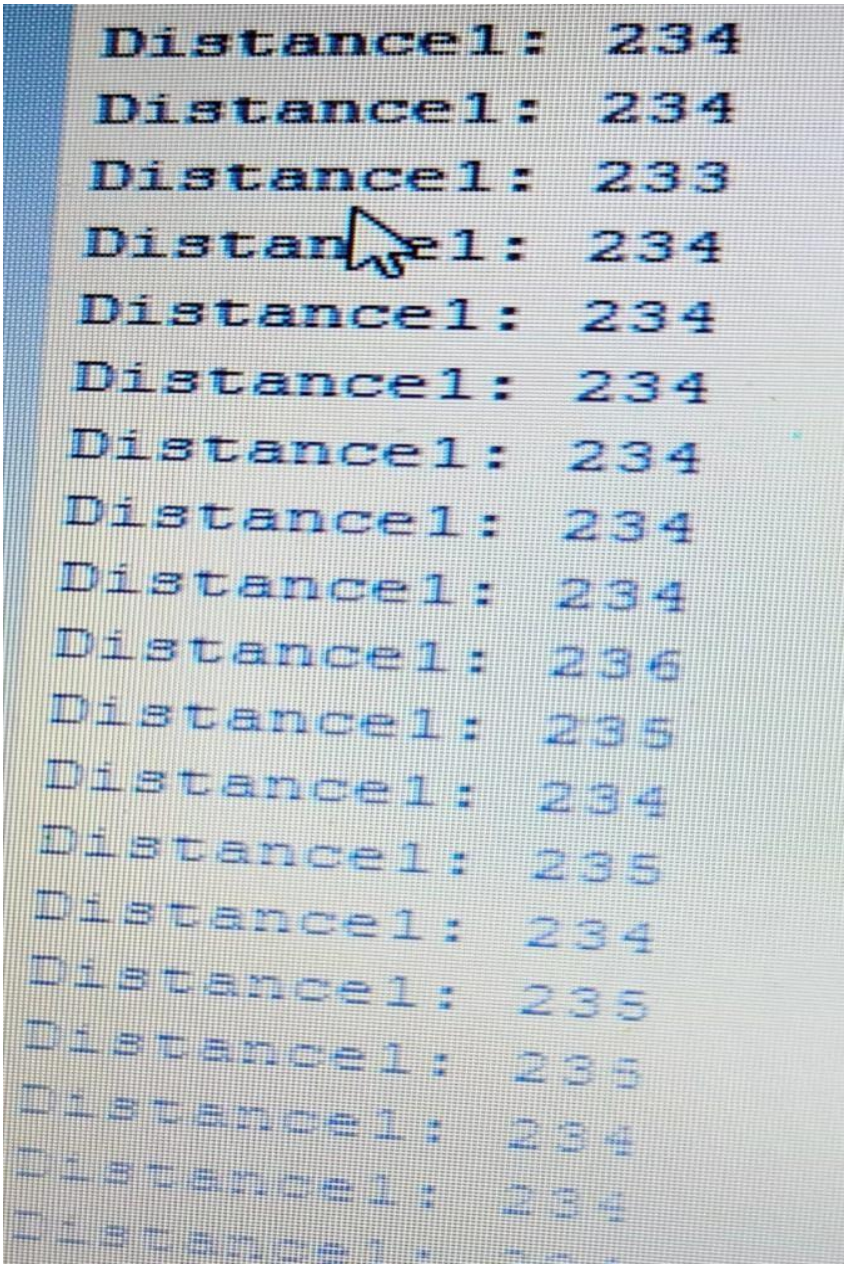

Figure 5.1: Far distance

When the touch is near to the ultrasonic sensor.

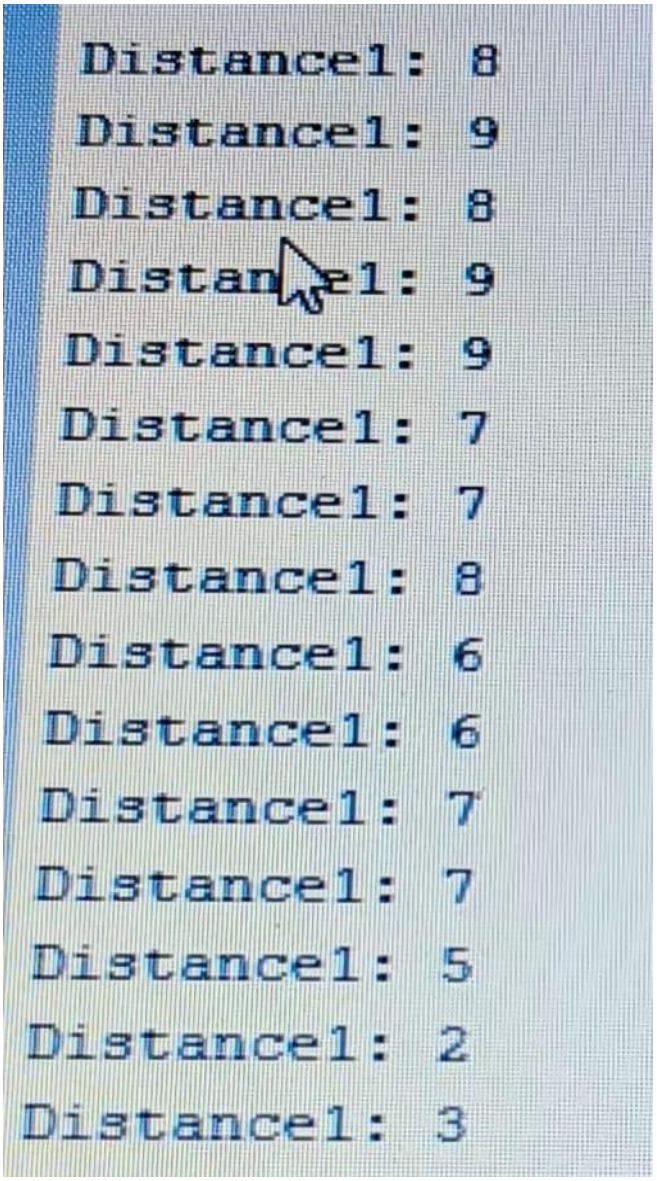

Figure 5.2: Near distance

5.2 HARDWARE RESULT:-

Figure 5.3: Jacket

Figure 5.4: Shock

Figure 5.5: Message

Figure 5.6: Circuit

CONCLUSION

We are concluding that electronic jacket for women safety with a shock circuit is a promising technology that can help women feel safer while walking alone or in secluded areas. The jacket is designed with sensors that detect any sudden movements or physical contact and the shock circuit is activated .shock delivered by the jacket is not life –threatening it is simply meant to startle the attacker and allow the wearer to escape or seek help.

Overall the electronic jacket for women safety with a shock circuit is an innovative solution to anissue that plagues women worldwide. With increasing cases of violence against women it is crucial to explore and implement technologies that can help to keep them safe.

FUTURE SCOPE:

The electronic jacket for women safety using shock circuit and beep sound has great potential for future development and widespread usage. Here are a few possibilities for its future scope:

1. Integration with GPS technology: The jacket could be linked with GPS technology which would enable women to track their location and send alerts to their loved ones and/or law enforcement officials in case of an emergency.

2. International Adoption: The jacket could be adopted in other countries as well to help address the growing concern of women's safety. This would require the jacket be made accessible and affordable to women across different socioeconomic strata.

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Paper Presentation Certificate

This is to certify that Sunitha P , of Dr TTIT has presented Paper Titled Electronic jacket for womens safety under ECE Track during 5th International Conference on Recent Trends in Technology, Engineering and Applied Science (ICRTTEAS-2023) held on 19th and 20th May 2023

Convener General Chair Vice Principal Principal

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