WOMEN SECURITY SYSYTEM USING IOT

Major Project submitted in partial fulfillment of the requirement for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

Under the esteemed guidance of

Mr. J. Sudhakar

Associate Professor

By

Bandi Rasmi Reddy (19R11A05E7)

Department of Computer Science and Engineering

Accredited by NBA

Geethanjali College of Engineering and Technology

(UGC Autonomous)

(Affiliated to J.N.T.U.H, Approved by AICTE, New Delhi)

Cheeryal (V), Keesara (M), Medchal.Dist.-501 301.

May-2023

Geethanjali College of Engineering & Technology

(UGC Autonomous)

(Affiliated to J.N.T.U.H, Approved by AICTE, New Delhi)Cheeryal (V), Keesara (M), Medchal.Dist.-501301.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Accredited by NBA

CERTIFICATE

This is to certify that the B.Tech Major Project report entitled "**WOMEN SECURITY SYSTEM USING IOT"** is a bonafide work done by **Bandi Rasmi Reddy (19R11A05E7),** in partial fulfillment of the requirement of the award for the degree of Bachelor of Technology in **"Computer Science and Engineering"** from Jawaharlal Nehru Technological University, Hyderabad during the year 2022-2023.

Internal Guide
Mr. J. Sudhakar
Associate Professor

HOD -CSE
Dr. A. Sree Lakshmi
Professor

External Examiner

Geethanjali College of Engineering & Technology

(UGC Autonomous)

(Affiliated to JNTUH Approved by AICTE, New Delhi)
Cheeryal (V), Keesara(M), Medchal Dist.-501 301.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Accredited by NBA

DECLARATION BY THE CANDIDATE

I, **Bandi Rasmi Reddy**, bearing **19R11A05E7** hereby declare that the project entitled "**WOMEN SECURITY SYSTEM USING IOT"** is done under the guidance of **Mr. J. Sudhakar**, Associate Professor, Department of Computer Science and Engineering, Geethanjali College of Engineeringand Technology, is submitted in partial fulfillment of the requirements for the award ofthe degree of **Bachelor of Technology in Computer Science and Engineering.**

This is a record of bonafide work carried out by us **in Geethanjali College of Engineering and Technology** and the results embodied in this project have not been reproduced or copied from any source. The results embodied in this project report have not been submitted to any other University or Institute for the award of any other degree or diploma.

BANDI RASMI REDDY (19R11A05E7)
Department of CSE,
Geethanjali College of Engineering and Technology,
Cheeryal.

ACKNOWLEDGEMENT

I would like to express my sincere thanks to **Dr. A. Sree Lakshmi**, Professor, Head of Department of Computer Science, Geethanjali College of Engineering and Technology,Cheeryal, whose motivation in the field of software development has madeus to overcome all hardships during the course of study and successful completion of project.

I would like to express my profound sense of gratitude to all for having helped us in completing this dissertation. I would like to express my deep-felt gratitude and sincere thanks to our guide **Mr. J. Sudhakar**, Associate Professor, Department of Computer Science, Geethanjali College of Engineering and Technology, Cheeryal, for her skillful guidance, timely suggestions, and encouragement in completing this project.

I would like to express my sincere gratitude to our Principal Prof. **Dr. S. Uday Kumar** for providing the necessary thankfulness to our Secretary **Mr. G. R. Ravinder Reddy** for providing an interdisciplinary & progressive environment.

Finally, I would like to express my heartfelt thanks to my parents who were very supportive both financially and mentally and for their encouragement to achieve my setgoals.

BANDI RASMI REDDY (19R11A05E7)

ABSTRACT

In today's world, women come across many situations that make them feel unsafe. Women from various walks of life face situations that make them feel threatened in different environments. Sixty-six per cent of women has reported sexual harassment in the year 2010 in New Delhi. It has also been proven that in urban environments, women are more prone to experience harassment especially in developing countries. In such situations, the aid of a safety device that will inform the victim's family members or the authorities (in severe situations) may help women feel safer, confident and reduce the chances of harassment. Though there are a few smart-phone based solutions for the same, it might not be possible for the victim to reach for her phone in some situations without the knowledge of the perpetrator. In this approach, the focuses on a security system that is designed merely to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges. The idea to develop a smart system for women is completely comfortable and also easy to use as compared to existing women security solutions such as infamous mobile apps, bulky belts and a separate garment that are just very abstract and obsolete.

LIST OF FIGURES

LIST OF ABBREVIATIONS

S.No	Acronym	Abbreviations
1.	IOT	Internet of Things
2.	GPS	Global Positioning System
3.	GSM	Global System for Mobile Communication
4.	GPIO	General Purpose Input and Output
5.	LCD	Liquid Crystal Display

TABLE OF CONTENTS

1. INTRODUCTION

1.1 INTRODUCTION

In today's world, women come across many situations that make them feel unsafe. Women from various walks of life face situations that make them feel threatened in different environments. In such situations, the aid of a safety device that will inform the victim's family members may help women feel safer, confident and reduce the chances of harassment.In this approach, the focuses on a security system that is designed merely to serve the purposeof providing security to women so that they never feel helpless while facing such social challenges. The idea to develop a smart system for women is completely comfortable and also easy to use as compared to existing women security solutions.

The device uses sensor network to communicate and to send alerts to them. The GPS and GSM are used to share the used to share the user's location directly to the saved contacts. So, in this project we have planned to propose a device which will act as a tool to provide security and ensures the safety of the women. Microcontroller, GSM and GPS module are used to send alert messages and current location of women to desired mobile numbers in their contacts.

1.2 BASIC HISTORY AND MOTIVATION

There are many devices such as Suraksha, Femme to help the women face the unexpected challenges they may face at any point of time. Using IOT for may applications has been doing great lately. We have been interested in IOT and also wanted to do with regard to safety of the women.

The challenging situations faced by many women now-a-days gave motivation to come up with a security device to help the women to do the work they liked to do. The application helps women to overcome their fear and can walk freely and complete their works even in odd hours. They need not worry about any condition and will be able to move anywhere when they wish to do so.

1.3 PROBLEM STATEMENT

This documentation focuses on the problem of the safety for women. Even-though there are many preventive measures being taken, the cases of sexual harassment has been inclined, especially in India. So, we need a security system that is designed solely to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges. The system which when activated, should track the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to two contacts. The system should also incorporate a screaming alarm, to call out for help and also body touch sensor helps in switching on the device without the need to push the button.

1.4 OBJECTIVES OF THE PROJECT.

The main objective in designing this project is to make women secured with smart applications and can identify the surroundings is safe or not for them. Whenever any difficulty arises they can alert their parents as well as nearby people so that the alert will goes to the people from time to time based on the GSM mechanism. Today in the current global scenario, the prime question in every girl's mind, considering the ever rising increase of issues on women harassment in recent past is mostly about her safety and security. To improve societal conditions for women by reducing high crime rates and general environment of danger for women by making use of technology. A positive change can be brought about in our society if women feel empowered against hooligans and anti-societal elements that indulge in reprehensible behavior such as harassment, stalking and molestation. We aim to foster a sense of safety among women by harnessing the capabilities of technology.

2. SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

Today, we have different applications and devices which contains the emergency buttons, which can alert family members of the victim. But the draw-back of all these existing systems are some device may be bulky in nature, so they are not portable these also require more hard ware which intern increases the implementation cost. While using existing application the battery may die which can be risk. Right now, the alert system for the women is done through an application which contains the SOS button which alert the family members of the women. In previous systems the alert system for the women is done through the application. For the security purpose the applications contain the SOS number which will alert the family members of the victim. women safety and security system is designed using the ARM processor. It has two inputs as two switches. By pressing the switch it is enable to detect the victim location by using GPS and SMS is sent to the predefined mobile number by using GSM module. Another switch is recognized as panic switch, if the women get panic she can press the switch so that an alarming system.

Drawbacks of the existing system:

- Victim's phone may be lost.
- Battery may die.
- Does not provide a complete kit solution.

2.2 PROPOSED SYSTEM

The proposed women safety device provides assistance to a woman who might be in an unsafe situation. The device is essentially ready for all the situations. It uses Raspberry Pi micro-controller. The design comprises of switch button and a body touch sensor to activate the device, GSM (Global System for Mobile Communications) module for sending alert messages, buzzer foralerting the environment and call alert. It has an LCD that displays the latitude and longitude of the location of the woman.

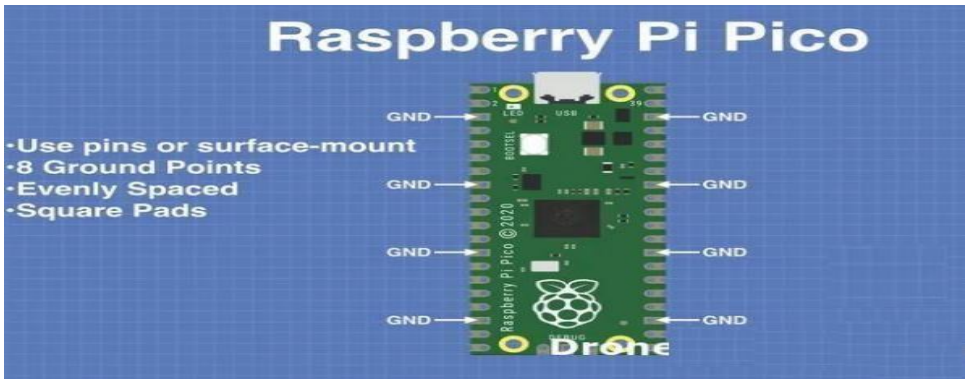
2.2.1 Details

Raspberry Pi Pico

The Raspberry Pi Foundation to release a microcontroller after all the makers of the world's most popular single-board computer never had expressedan interest in microcontrollers.

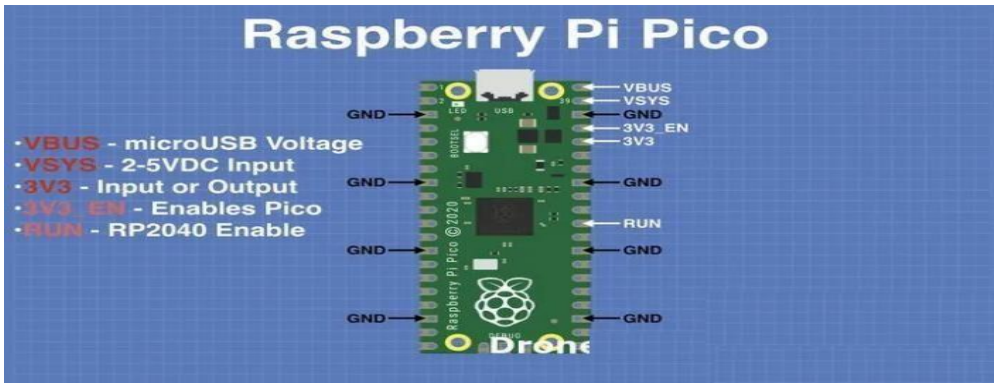
Ground Pins

There are several ground connections on the board, eight of them plus an additional one on the 3-pin Debug connector. These pins are easy to spot, they are evenly spaced and are square as opposed to rounded like the other connections One of the ground connections, on pin 33, is also designated the Analog Ground.



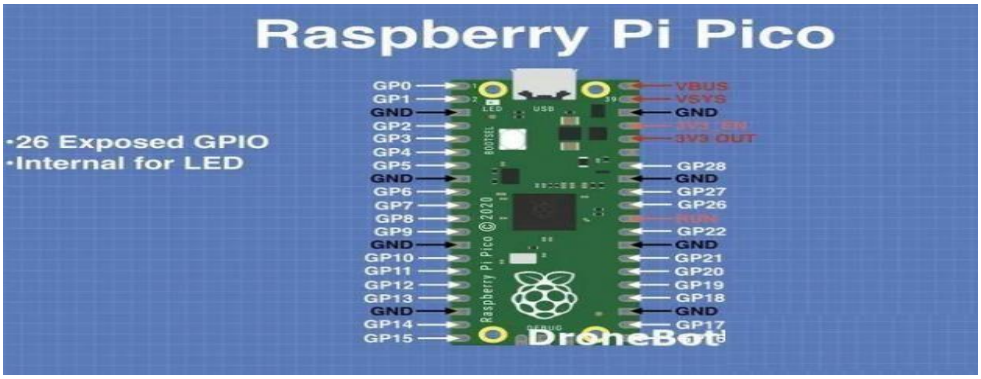
Power Pins

The Pico is a 3.3-volt logic device; however, it can be powered with a range of power supplies thanks to a built-in voltage converter and regulator. All of the power-related pins are groped in one section on the board, close to the micro USB connector.



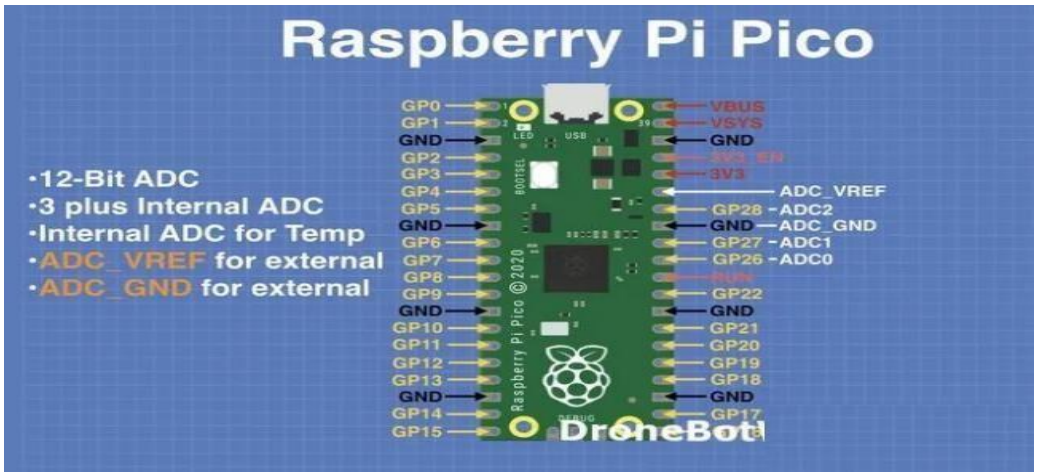
GPIO Pins

There are 26 exposed GPIO connections on the Raspberry Pi Pico board. The GPIO pins are one way in which the Raspberry Pi can control and monitor the outside world by being connected to electronic circuits. The Pi can control LEDs, turning them on or off, drive motors, and interact with many other objects.



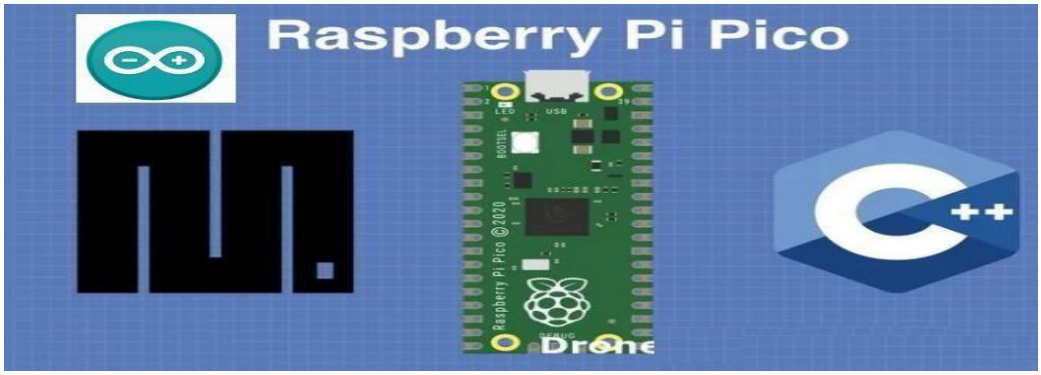
Analog Pins

The Pico has three Analog-to-Digital Converters, plus a fourth one used internally for an on-board temperature sensor.



Programming the Pico

We can get started with the Pico using micro python.



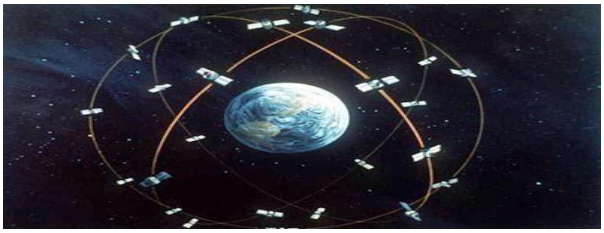
- Micro Python – A subset of Python, Micro Python is an interpreted language that is made specifically for microcontrollers.

GSM:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network.

Global Positioning System

The Global Positioning System (GPS) is the most significant recent advance in navigation and positioning technology.

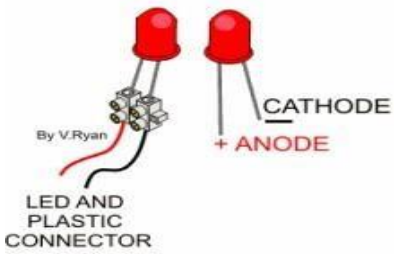


Liquid Crystal Display

Liquid crystal display a type of display used in digital watches and many portable computers. The liquid crystals can be manipulated through an applied electric voltage so that light is allowed to pass or is blocked. Here the LCD is used at both the transmitter as well as the receiver side. The input which we give to the microcontroller is displayed on the LCD of the transmitter side and the message sent is received at the receiver side which displays at the receiver end of the LCD and the corresponding operation is performed.

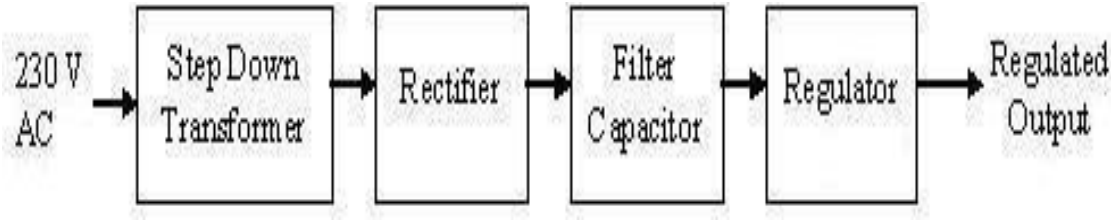
Light-Emitting Diode

A light-emitting diode (LED) is a semiconductor diode that emits incoherent narrow spectrum light when electrically biased in the forward direction of the pin junction as in the common LED circuit. This effect is a form of electroluminescence While sending a message in the form of bits such as 1, the data is sent to the receiver side correspondingly the LED glows representing the data is being received simultaneously when we send 8 as a data the LED gets off.



POWER SUPPLY

All digital circuits require regulated power supply. The below block diagram shows howto get a regulated positive supply from the mains supply.



2.2.2 Impact on Environment

The system is designed in such a way that its impact on environment is very safe and does not impact environment in wrong way.

2.2.3 Safety

The reliability is guaranteed as the components involved are not too complex, and it is a very secure method to alert the desired family members without leaking any information. Data or other information such as intruder's images are also kept very secure for future use.

2.2.4 Ethics

The application follows the general ethics. We have followed the general ethics- not harming anybody physically or virtually, and maintaining confidentiality.

2.2.5 Cost

The Cost of the project is high, since we had to purchase all the components for the project and connect them through power supply, it is a bit complex.

2.2.6 Type

Our project is based on Internet of the things.

2.2.7 Standards

Software process, which can deal with many challenges facing the IoT development process. These challenges include volatility of requirements, strong user involvement, development time tightness, process simplicity, and production of valuable system design at low cost. The design divides the project into a implementation of code and then connecting each components.

2.3 Scope of the Project

Women safety is one of the major issues in today's world. The world is becoming so much unsafe for women. In today's world, most of the women are stepping out at any time from their house for working. Even though many technologies have been introduced for women still kidnapping, eve teasing and sexual harassment are taking place in our country. In last few years crime against women has increased to a greater extent. Women are harassed not only in the evening or night but also during day hours at home, working place, shopping etc. There is number of women's who have been afraid of strangers for their safety.

2.4 MODULES

User (Woman)
User is the one who pushes on the panic button.

Microcontroller
Microcontroller takes input and makes GSM to message and GPS to find location.

Device (Mobile)
This is one of the registered contacts on the women's mobile. As the microcontroller receives input all the activities result in this device such as call alert.

2.5 System Configuration

Hardware Requirements

Raspberry pi

The Raspberry Pi is a very cheap computer that runs Linux, but it also provides a set of GPIO (general purpose input/output) pins, allowing you to control electronic components for physical computing and explore the Internet of Things. It is a minicomputer the size of a credit card that is interoperable with any input and output hardware device like a monitor, a television, a mouse, or a keyboard – effectively converting the set-up into a full-fledged PC at a low cost.

Global Positioning System

The Global Positioning System is primarily used for location or tracking applications which are reliant on the triangulation of the orbiting satellites on a GPS tracking antenna and receiver in the object or device in use. it can indicate location, altitude, speed, time, and direction. For example, IoT devices can be used to monitor user's health conditions, such as body temperature, heart rate, movements, and other medical information.

Liquid crystal display

LCD is a type of flat panel display which uses liquid crystals in its primary form of operation.

Light Emitting Diode

A light-emitting diode (LED) is a semiconductor device that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.

Alarm

Alarms are instances of alarm models. The alarm model specifies what to detect, when to send notifications, who gets notified, and more. You can also specify oneor more supported actions that occur when the alarm state changes. AWS IoT Events routes input attributes derived from your data to the appropriate alarms.

GSM SIM 800

The GSM technology is used which uses mobile stations, base substations for mobile access.

Software requirements

Arduino

The Arduino Integrated Development Environment - or Arduino Software contains a text editor for writing code, a message area, a text console.

3. LITERATURE OVERVIEW

3.1 INTRODUCTION

The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 is a legislative act in India that seeks to protect women from sexual harassment at their place of work. Today women are playing an important role as a president, prime minister, speaker of the Lok Sabha and even in the field of aeronautics, military, IPS, IAS, etc. Even today women have achieved top positions in job and society, yet they are facing problems such as physical harassment and the sexual assault. The cases of harassment and rapes on women are increasing hence security issue for such woman is more important. So, it is essential to develop a system to provide security to women.

3.2 LITERATURE SURVEY

We have done our literature survey from various sites such as Wikipedia and research papers. This device named as "Suraksha" is a security system specially designed for women in distress. The basic approach is to intimidate instant location and a distress message to the cops and registered number, so that unfortunate incidents would be averted and to provide real time evidence for swift action against the perpetrators of crime against women.

FEMME

It is designed like an application that can used by everyone who would have installed and this and make use of this in their mobiles and devices.

SMARISA

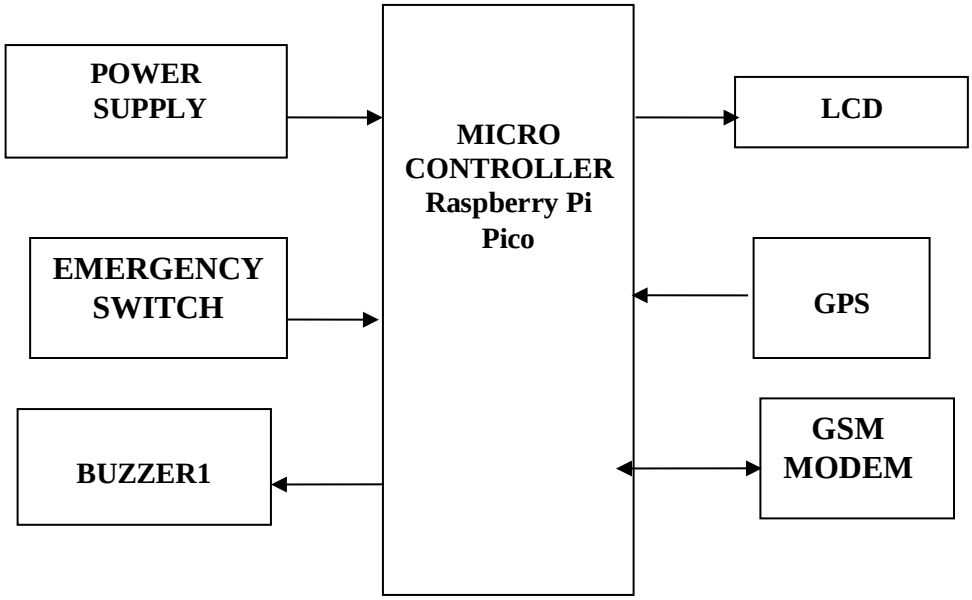
Android application sends current location of user to emergency contacts through SMS as well as update location to the cloud. Then raspberry pi sends the GPS.

SURAKSHA

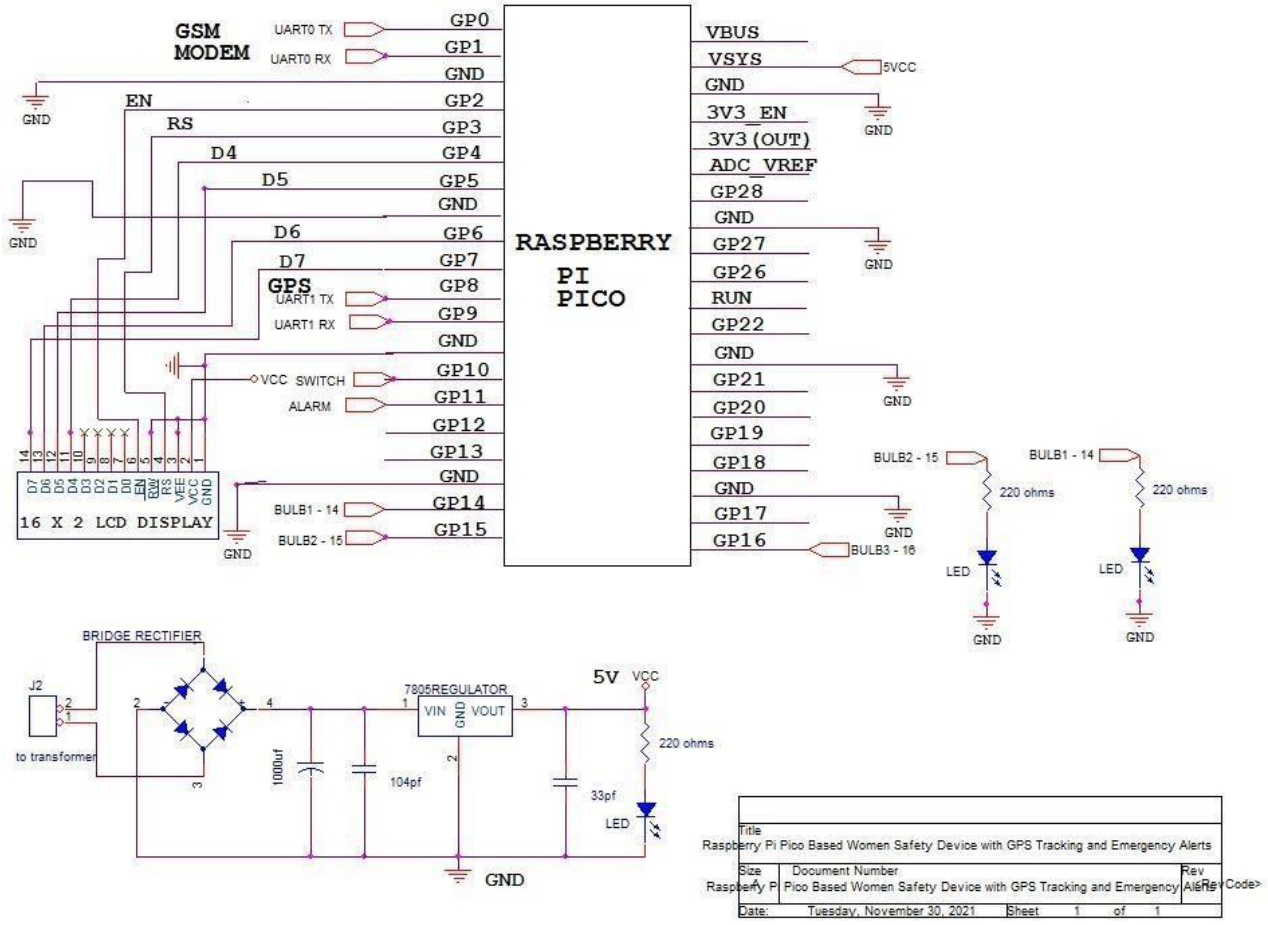
The device when not in use will be locked so that unnecessary signals are not sent. For unlocking it, a simple voice command is sufficient.

4. HARDWARE DESIGN

4.1 BLOCK DIAGRAM



4.2 SCHEMATIC DIAGRAM



5. SAMPLE CODE

5.1 ESP-32 CAM Code

```
#include <Arduino.h>
#include <WiFi.h>
#include <WiFiClientSecure.h>
#include  "soc/soc.h"
#include "soc/rtc_cntl_reg.h"
#include "esp_camera.h"
#include <UniversalTelegramBot.h>
#include <ArduinoJson.h>

const char* ssid = "project";
const char* password = "project1234";

// Initialize Telegram BOT
String BOTtoken = "5568202885:AAEIuA1W3Pm_c9_Ju4KZxW9piCB-O3XzMTQ";  // your
Bot Token (Get from Botfather)
// Use @myidbot to find out the chat ID of an individual or a group
// Also note that you need to click "start" on a bot before it can
// message you
String CHAT_ID = "1116761518";
bool sendPhoto = false;

WiFiClientSecure clientTCP;
UniversalTelegramBot bot(BOTtoken, clientTCP);

#define FLASH_LED_PIN 4
bool flashState = LOW;

int gpioPIR = 13;

#define RLED 12
#define GLED 14

//Checks for new messages every 1 second.
int botRequestDelay = 1000;
unsigned long lastTimeBotRan;
```

```
//CAMERA_MODEL_AI_THINKER
#define PWDN_GPIO_NUM     32
#define RESET_GPIO_NUM    -1
#define XCLK_GPIO_NUM      0
#define SIOD_GPIO_NUM     26
#define SIOC_GPIO_NUM     27
#define Y9_GPIO_NUM       35
#define Y8_GPIO_NUM       34
#define Y7_GPIO_NUM       39
#define Y6_GPIO_NUM       36
#define Y5_GPIO_NUM       21
#define Y4_GPIO_NUM       19
#define Y3_GPIO_NUM       18
#define Y2_GPIO_NUM        5
#define VSYNC_GPIO_NUM    25
#define HREF_GPIO_NUM     23
#define PCLK_GPIO_NUM     22


void configInitCamera(){
  camera_config_t config;
  config.ledc_channel = LEDC_CHANNEL_0;
  config.ledc_timer = LEDC_TIMER_0;
  config.pin_d0 = Y2_GPIO_NUM;
  config.pin_d1 = Y3_GPIO_NUM;
  config.pin_d2 = Y4_GPIO_NUM;
  config.pin_d3 = Y5_GPIO_NUM;
  config.pin_d4 = Y6_GPIO_NUM;
  config.pin_d5 = Y7_GPIO_NUM;
  config.pin_d6 = Y8_GPIO_NUM;
  config.pin_d7 = Y9_GPIO_NUM;
  config.pin_xclk = XCLK_GPIO_NUM;
  config.pin_pclk = PCLK_GPIO_NUM;
  config.pin_vsync = VSYNC_GPIO_NUM;
  config.pin_href = HREF_GPIO_NUM;
  config.pin_sscb_sda = SIOD_GPIO_NUM;
  config.pin_sscb_scl = SIOC_GPIO_NUM;
  config.pin_pwdn = PWDN_GPIO_NUM;
  config.pin_reset = RESET_GPIO_NUM;
  config.xclk_freq_hz = 20000000;
  config.pixel_format = PIXFORMAT_JPEG;
```

```
//init with high specs to pre-allocate larger buffers
  if(psramFound()){
    config.frame_size = FRAMESIZE_UXGA;
    config.jpeg_quality = 10;  //0-63 lower number means higher quality
    config.fb_count = 2;
  } else {
    config.frame_size = FRAMESIZE_SVGA;
    config.jpeg_quality = 12;  //0-63 lower number means higher quality
    config.fb_count = 1;
  }

  // camera init
  esp_err_t err = esp_camera_init(&config);
  if (err != ESP_OK) {
    Serial.printf("Camera init failed with error 0x%x", err);
    delay(1000);
    ESP.restart();
  }

  // Drop down frame size for higher initial frame rate
  sensor_t * s = esp_camera_sensor_get();
  s->set_framesize(s, FRAMESIZE_CIF); //
UXGA|SXGA|XGA|SVGA|VGA|CIF|QVGA|HQVGA|QQVGA
}
void handleNewMessages(int numNewMessages) {
  Serial.print("Handle New Messages: ");
  Serial.println(numNewMessages);

  for (int i = 0; i < numNewMessages; i++) {
    String chat_id = String(bot.messages[i].chat_id);
    if (chat_id != CHAT_ID){
      bot.sendMessage(chat_id, "Unauthorized user", "");
      continue;
    }

    // Print the received message
    String text = bot.messages[i].text;
    Serial.println(text);

    String from_name = bot.messages[i].from_name;
    if (text == "/start") {
      String welcome = "Welcome , " + from_name + "\n";
      welcome += "Smart School Bus - PHOTO ALERT \n";
```

```
      welcome += "/photo : takes a new photo\n";
      welcome += "/flash : toggles flash LED \n";
      bot.sendMessage(CHAT_ID, welcome, "");
    }



if (text == "/flash") {
      flashState = !flashState;
      digitalWrite(FLASH_LED_PIN, flashState);
      Serial.println("Change flash LED state");
    }
    if (text == "/photo") {
      sendPhoto = true;
      Serial.println("New photo request");
    }
  }
}

String sendPhotoTelegram() {
  const char* myDomain = "api.telegram.org";
  String getAll = "";
  String getBody = "";

  camera_fb_t * fb = NULL;
  fb = esp_camera_fb_get();
  if(!fb) {
    Serial.println("Camera capture failed");
    delay(1000);
    ESP.restart();
    return "Camera capture failed";
  }

  Serial.println("Connect to " + String(myDomain));


  if (clientTCP.connect(myDomain, 443)) {
    Serial.println("Connection successful");

    String head = "--India\r\nContent-Disposition: form-data;
name=\"chat_id\"; \r\n\r\n" + CHAT_ID + "\r\n--India\r\nContent-Disposition:
form-data; name=\"photo\"; filename=\"esp32-cam.jpg\"\r\nContent-Type:
image/jpeg\r\n\r\n";
```

```
    String tail = "\r\n--India--\r\n";

    uint16_t imageLen = fb->len;
    uint16_t extraLen = head.length() + tail.length();
    uint16_t totalLen = imageLen + extraLen;

    clientTCP.println("POST /bot"+BOTtoken+"/sendPhoto HTTP/1.1");
    clientTCP.println("Host: " + String(myDomain));
    clientTCP.println("Content-Length: " + String(totalLen));
    clientTCP.println("Content-Type: multipart/form-data; boundary=India");
    clientTCP.println();
    clientTCP.print(head);


uint8_t *fbBuf = fb->buf;
    size_t fbLen = fb->len;
    for (size_t n=0;n<fbLen;n=n+1024) {
      if (n+1024<fbLen) {
        clientTCP.write(fbBuf, 1024);
        fbBuf += 1024;
      }
      else if (fbLen%1024>0) {
        size_t remainder = fbLen%1024;
        clientTCP.write(fbBuf, remainder);
      }
    }

    clientTCP.print(tail);

    esp_camera_fb_return(fb);

    int waitTime = 10000;   // timeout 10 seconds
    long startTimer = millis();
    boolean state = false;

    while ((startTimer + waitTime) > millis()){
      Serial.print(".");
      delay(100);
      while (clientTCP.available()) {
        char c = clientTCP.read();
        if (state==true) getBody += String(c);
        if (c == '\n') {
          if (getAll.length()==0) state=true;
```

```
          getAll = "";
        }
        else if (c != '\r')
          getAll += String(c);
        startTimer = millis();
      }
      if (getBody.length()>0) break;
    }
    clientTCP.stop();
    Serial.println(getBody);
  }
  else {
    getBody="Connected to api.telegram.org failed.";
    Serial.println("Connected to api.telegram.org failed.");
  }
  return getBody;
}



void setup(){
  WRITE_PERI_REG(RTC_CNTL_BROWN_OUT_REG, 0);
  // Init Serial Monitor
  Serial.begin(115200);
pinMode(gpioPIR, INPUT_PULLUP);
pinMode(RLED,OUTPUT);
pinMode(GLED,OUTPUT);

digitalWrite(RLED,LOW);
digitalWrite(GLED,LOW);
  // Set LED Flash as output
  pinMode(FLASH_LED_PIN, OUTPUT);
  digitalWrite(FLASH_LED_PIN, flashState);

  // Config and init the camera
  configInitCamera();
  // Connect to Wi-Fi
  WiFi.mode(WIFI_STA);
  Serial.println();
  Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
clientTCP.setCACert(TELEGRAM_CERTIFICATE_ROOT);
```

```
  while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");
    delay(500);
  }
  Serial.println();
  Serial.print("ESP32-CAM IP Address: ");
  Serial.println(WiFi.localIP());
}
void loop()
{

int v = digitalRead(gpioPIR);
Serial.println(v);
if (v==0)
{
digitalWrite(GLED,HIGH);
digitalWrite(RLED,LOW);
delay(100);
}
if (v==1)
{
digitalWrite(GLED,LOW);
digitalWrite(RLED,HIGH);
sendPhoto = true;
delay(2000);
}
  if (sendPhoto)
  {
    Serial.println("Preparing photo");
    sendPhotoTelegram();
    sendPhoto = false;
  }
  if (millis() > lastTimeBotRan + botRequestDelay)  {
    int numNewMessages = bot.getUpdates(bot.last_message_received + 1);
    while (numNewMessages) {
      Serial.println("got response");
      handleNewMessages(numNewMessages);
      numNewMessages = bot.getUpdates(bot.last_message_received + 1);
    }
    lastTimeBotRan = millis();
  }
}
```

5.2 RASPBERRY-PI Code

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(2, 3, 4, 5, 6, 7);

const int SW=10;         ////////////////switch women
int SWalert=1;         // variable for reading the pushbutton status

const int SW1=12;         ////////////////switch GPS
int SWalert1=1;         // variable for reading the pushbutton status

int i=0;
int gps_status=0;
float latitude=0;
float logitude=0;
String gpsString="";
char *test="$GPRMC";



int BUZZ = 11; //Connect BUZZ  To Pin #11 ////////buzzer
int RLED = 14; //Connect LED  To Pin #14 ///////led
int GLED = 15; //Connect relay To Pin #15 ///////relay
int CAM = 13; //Connect BUZZ  To Pin #13 ////////CAM

void initModule(String cmd, char *res, int t)
{
while(1)
{
Serial1.println(cmd);
delay(100);
while(Serial1.available()>0)
{
if(Serial1.find(res))
{
Serial1.println(res);
delay(t);
```

```
return;
}
else
{
Serial1.println("Error");
}
}
delay(t);
}
}
void setup()
{
lcd.begin(16, 2);
Serial1.begin(9600);
Serial2.begin(9600);

pinMode(SW, INPUT);
pinMode(BUZZ, OUTPUT);
pinMode(RLED, OUTPUT);
pinMode(GLED, OUTPUT);
pinMode(CAM, OUTPUT);

digitalWrite(BUZZ,LOW);
digitalWrite(RLED,LOW);
digitalWrite(GLED,LOW);
digitalWrite(CAM,LOW);
lcd.clear();



lcd.setCursor(0,0);lcd.print("Women Security ");
lcd.setCursor(0,1);lcd.print("System Using IOT");delay(5000);lcd.clear();

lcd.setCursor(0,0);lcd.print("Waiting For GPS");
lcd.setCursor(0,1);lcd.print(" Signal    ");
SWalert1 = digitalRead(SW1);
if (SWalert1 == LOW)
{
get_gps();show_coordinate();delay(2000);lcd.clear();
}
```

```
else
{
float latitude=17.520588;
float logitude=78.630969;
lcd.clear();
lcd.print("Lat:17.520588");
lcd.setCursor(0,1);
lcd.print("Log:78.630969");
delay(2000);
lcd.clear();
}
digitalWrite(BUZZ,LOW);delay(100); digitalWrite(GLED,HIGH);

lcd.setCursor(0,0);lcd.print("GPS is OK");delay(1000);lcd.clear();

lcd.setCursor(0,0);lcd.print("Initializing");
lcd.setCursor(0,1);lcd.print("GSM MODEM");delay(1000);
initModule("AT","OK",1000);
initModule("AT+CPIN?","READY",1000);
initModule("AT+CMGF=1","OK",1000);
digitalWrite(GLED,LOW);delay(100);
lcd.setCursor(0,0);lcd.print("Initialized");
lcd.setCursor(0,1);lcd.print("Successfully");
delay(200);lcd.clear();
}

void loop()
{st:
SWalert = digitalRead(SW);
if (SWalert == LOW)
{
lcd.setCursor(0,0);
lcd.print(" WOMEN ");
lcd.setCursor(0,1);
lcd.print(" IN TROUBLE     ");
digitalWrite(BUZZ,HIGH);delay(100);
digitalWrite(RLED,HIGH);delay(100);
digitalWrite(GLED,LOW);delay(100);
digitalWrite(CAM,HIGH);delay(100);
```

```
delay(2000);lcd.clear();lcd.print("Sending SMS
");delay(2000);Send();delay(2000);
digitalWrite(CAM,LOW);delay(100);delay(100);
initModule("AT","OK",1000);initModule("AT","OK",1000);
lcd.clear();lcd.print("CALLING------1 ");
Serial1.print("ATD+91");Serial1.print("9390971342");
Serial1.print(";\r\n");delay(12000);
Serial1.println("ATH");delay(2000);
initModule("AT","OK",1000);initModule("AT","OK",1000);lcd.clear();
lcd.clear();lcd.print("CALLING------2 ");
Serial1.print("ATD+91");Serial1.print("9391064641");
Serial1.print(";\r\n");delay(12000);
Serial1.println("ATH");delay(2000);
initModule("AT","OK",1000);initModule("AT","OK",1000);lcd.clear();
lcd.clear();lcd.print("CALLING------3 ");
Serial1.print("ATD+91");Serial1.print("6309409135");
Serial1.print(";\r\n");delay(12000);
Serial1.println("ATH");delay(2000);
initModule("AT","OK",1000);initModule("AT","OK",1000);lcd.clear();
goto st;
}
else
{
lcd.setCursor(0,0);
lcd.print(" WOMEN ");
lcd.setCursor(0,1);
lcd.print("  IS  SAFE      ");
digitalWrite(BUZZ,LOW);delay(100);
digitalWrite(RLED,LOW);delay(100);
digitalWrite(GLED,HIGH);delay(100);
}
}
void gpsEvent()
{
gpsString="";
while(1)
{
while (Serial2.available()>0)  //Serial incoming data from GPS
{
char inChar = (char)Serial2.read();
gpsString+= inChar;  //store incoming data from GPS to temporary string
str[]
i++;
```

```
if (i < 7)
{
if(gpsString[i-1] != test[i-1])  //check for right string
{
i=0;
gpsString="";
}
}
if(inChar=='\r')
{
if(i>65)
{
gps_status=1;
break;
}
else
{
i=0;
}
}
}
if(gps_status)
break;
}
}

void get_gps()
{
lcd.clear();
lcd.print("Getting GPS Data");
lcd.setCursor(0,1);
lcd.print("Please Wait .... ");
gps_status=0;
int x=0;
while(gps_status==0)
{
gpsEvent();
int str_lenth=i;
coordinate2dec();
i=0;x=0;
str_lenth=0;
}
}
```

```
void show_coordinate()
{
lcd.clear();
lcd.print("Lat:");
lcd.print(latitude);
lcd.setCursor(0,1);
lcd.print("Log:");
lcd.print(logitude);
delay(2000);
lcd.clear();
}

//$GPRMC,053508.00,A,1725.64574,N,07835.11697,E,0.041,,121217,,,D*79
void coordinate2dec()
{
String lat_degree="";
for(i=19;i<=20;i++)
lat_degree+=gpsString[i];
String lat_minut="";
for(i=21;i<=27;i++)
lat_minut+=gpsString[i];
String log_degree="";
for(i=32;i<=34;i++)
log_degree+=gpsString[i];
String log_minut="";
for(i=35;i<=41;i++)
log_minut+=gpsString[i];
float minut= lat_minut.toFloat();
minut=minut/60;
float degree=lat_degree.toFloat();
latitude=degree+minut;
minut= log_minut.toFloat();
minut=minut/60;
degree=log_degree.toFloat();
logitude=degree+minut;
}


void init_sms1()
{Serial1.println("AT+CMGF=1");delay(400);Serial1.println("AT+CMGS=\"93909713
42\""); delay(400);}
void init_sms2()
```

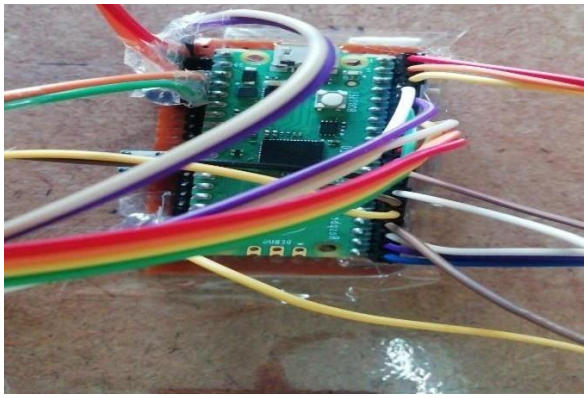
```
{Serial1.println("AT+CMGF=1");delay(400);Serial1.println("AT+CMGS=\"93910646
41\""); delay(400);}
void init_sms3()
{Serial1.println("AT+CMGF=1");delay(400);Serial1.println("AT+CMGS=\"63094091
35\""); delay(400);}
void send_data(String message)
{ Serial1.print(message);delay(200);}

void lcd_status()
{lcd.clear();lcd.print("Message Sent");  delay(3000); lcd.clear(); return;}

void Send_sms()
{
lcd.clear();lcd.print("Sending SMS ");
Serial1.println("I am in Trouble");delay(500);
Serial1.println("Plz Help me");delay(500);
Serial1.println("Plz Rescue ");
SWalert1 = digitalRead(SW1);
if (SWalert1 == LOW)
{
get_gps();show_coordinate();delay(500);lcd.clear();
Serial1.print("https://www.google.com/maps/place/");
Serial1.print(latitude,6);Serial1.print(",");Serial1.print(logitude,6);Seria
l1.write(26);delay(2000);
}
else
{
Serial1.print("https://www.google.com/maps/place/17.520588,78.630969");
delay(500);Serial1.write(26);delay(2000);
}
delay(2000);lcd.clear();lcd.print("Message Sent "); delay(1000);
lcd.clear();
Serial1.print("AT\r\n");delay(500);Serial1.print("AT\r\n");delay(500);Serial
1.println("AT+CMGF=1");delay(200);lcd.clear();
lcd_status();
}
void Send()
{
init_sms1();delay(1000);lcd.clear();lcd.print("Sending  SMS1  ");Send_sms();
init_sms2();delay(1000);lcd.clear();lcd.print("Sending  SMS2  ");Send_sms();
init_sms3();delay(1000);lcd.clear();lcd.print("Sending SMS3  ");Send_sms();
}
```

6. IMPLEMENTATION

6.1 COMPONENTS

- Start with the connections.
- Connect the power supply.

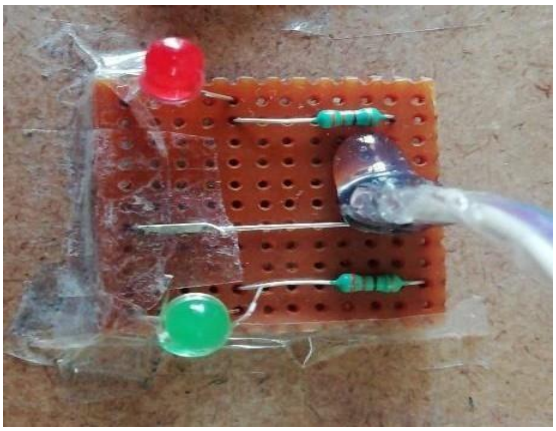
- Then we make use of the raspberry Pi Pico which has GPIO pins.



- A USB socket is artificial hallow into which something fits, in which we try to give power to our microcontroller.
- A 5 Volts power supply is present.
- An external power supply has to be used in this model.

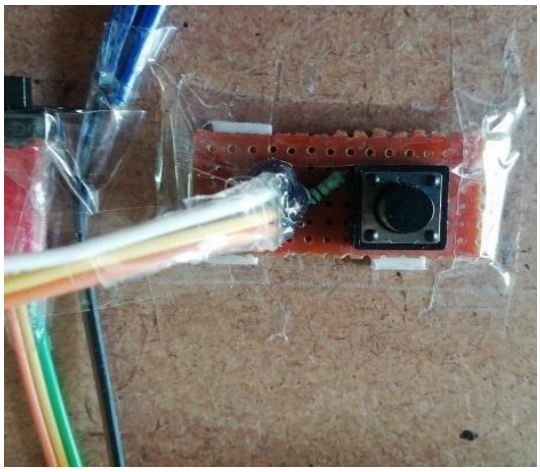
- A 16*2 LCD display is used to show whatever is going on in the processor.

- There are 2 LED, one is green and the other red representing the safe and danger situation respectively.



- There is a buzzer for alerting the surroundings of the woman.

- Switch button is available.

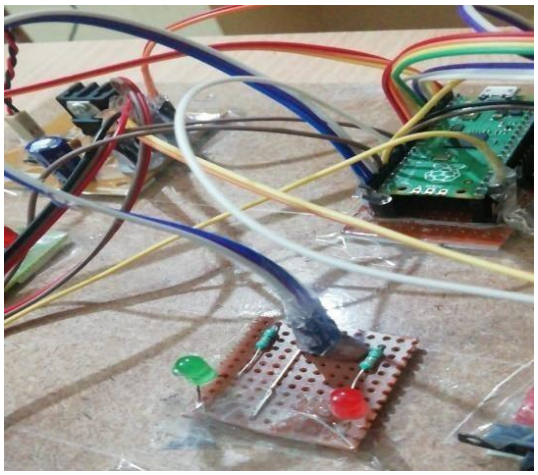


- GPS takes the longitude and latitude value.

- The GSM module has components like adapter, bridge rectifier,LED etc.3G/4G micro sim card can be used.

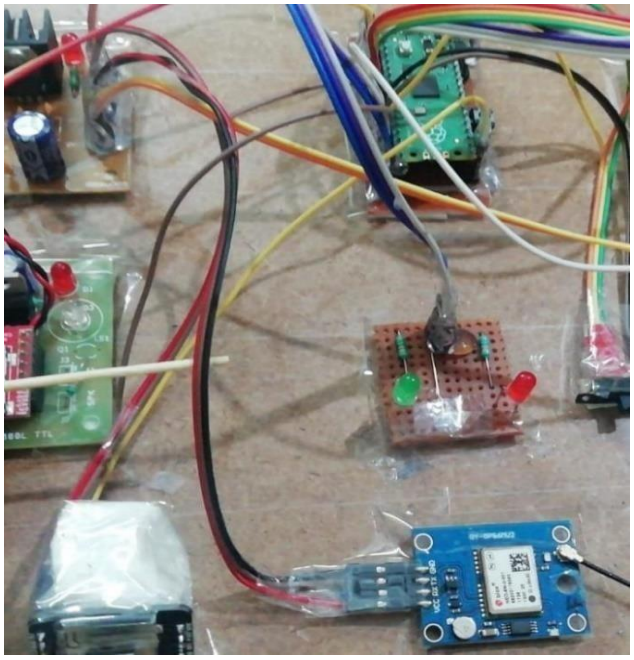
- An ESP32 camera is also be used for sending the photos of the attacker through telegram.

- We connected the GP14 and GP15 and GND (18) to the LEDs using breadboard and resistors to manage the fluctuating voltage.

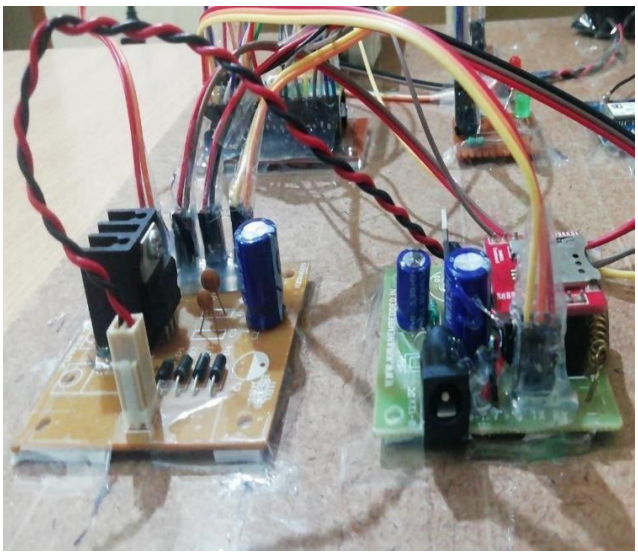


6.2 CONNECTIONS

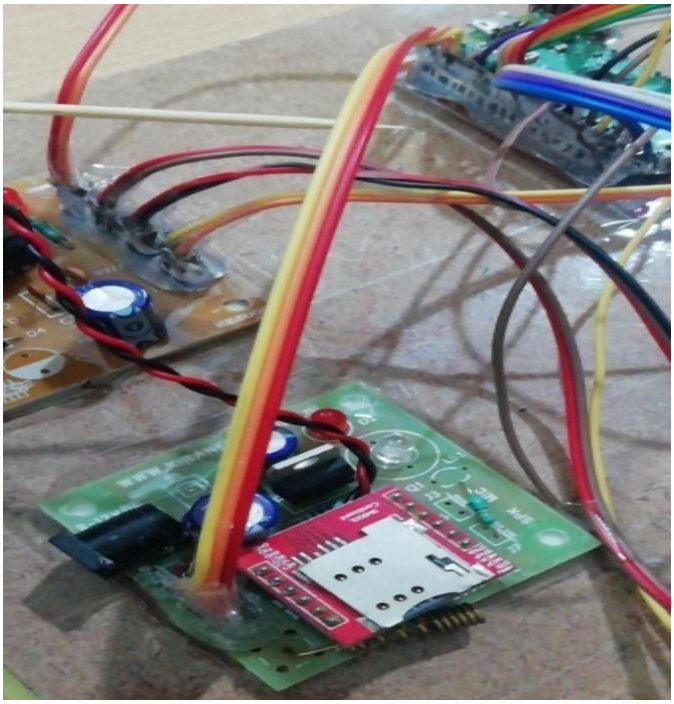
- We have connected the GPS to the power supply.



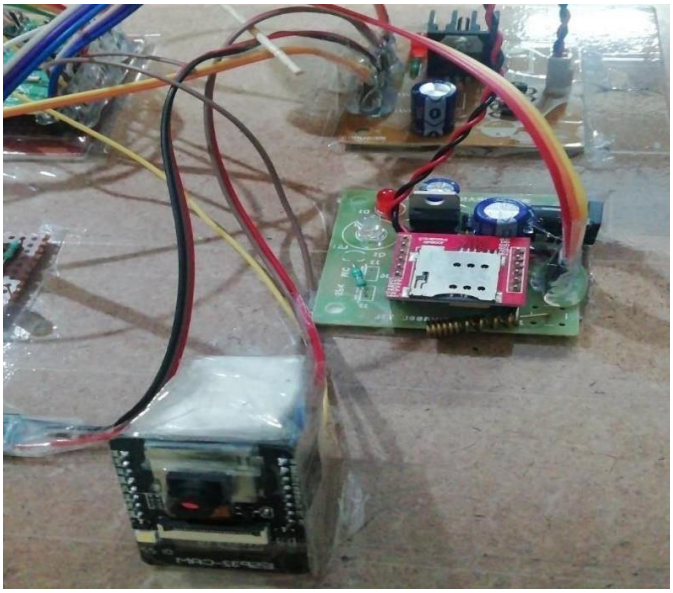
- We connected the GSM to the power supply .



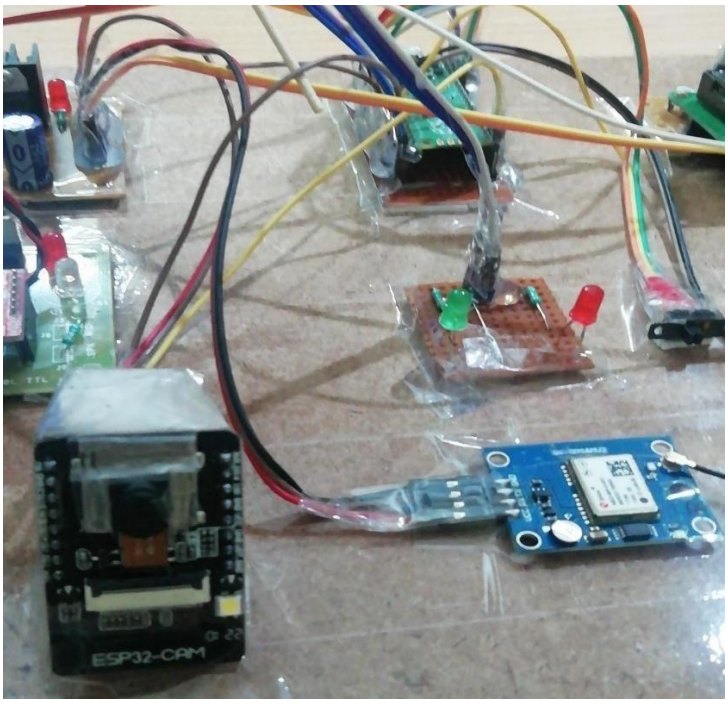
- microcontroller pins GP0,GP1,GND(3).



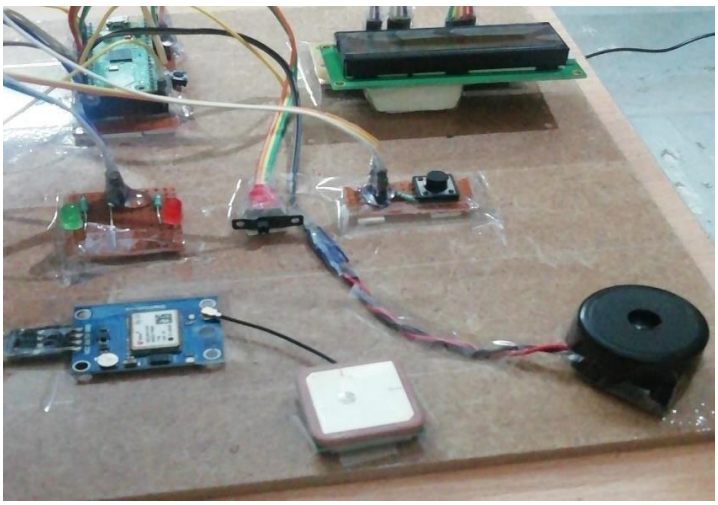
- We then connected the ESP32-CAM to the power supply,



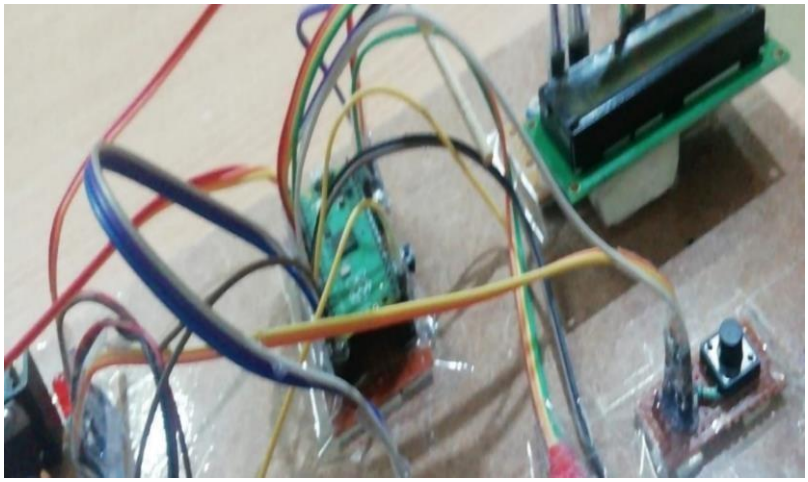
- the Raspberry pi pico GP13, GP17.



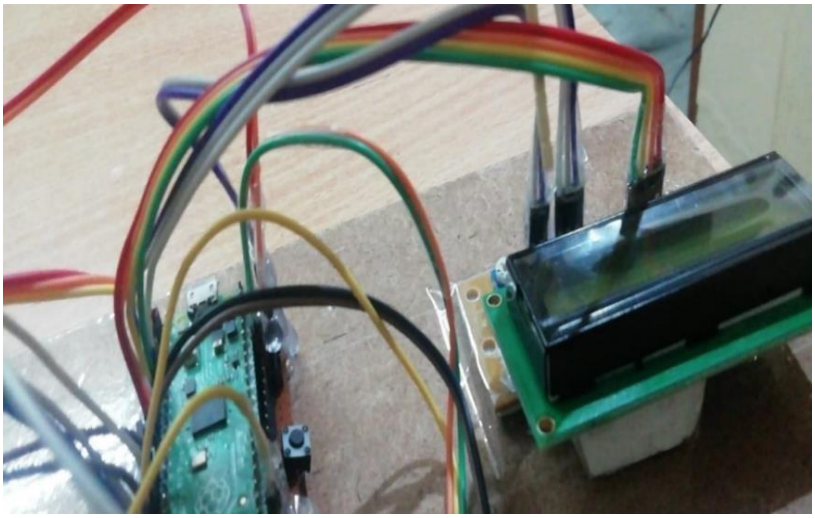
- The buzzer is connected to the GP11, GND(13) to the microcontroller pins.



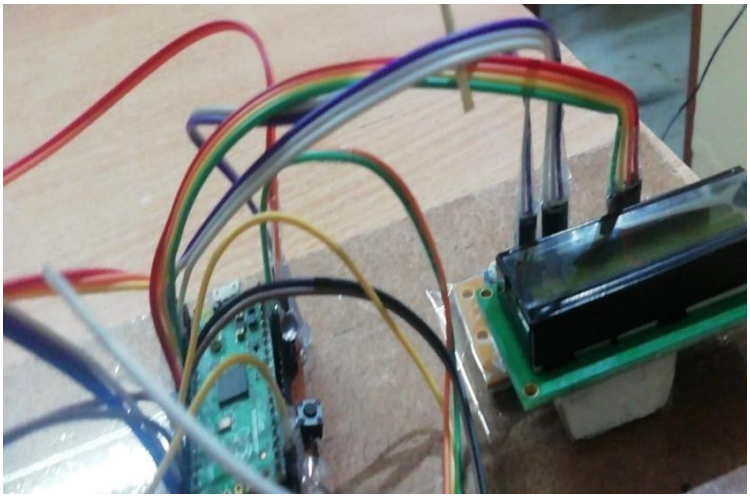
- The switch is connected to the GP12 raspberry pi pin and to the 9V power supply.



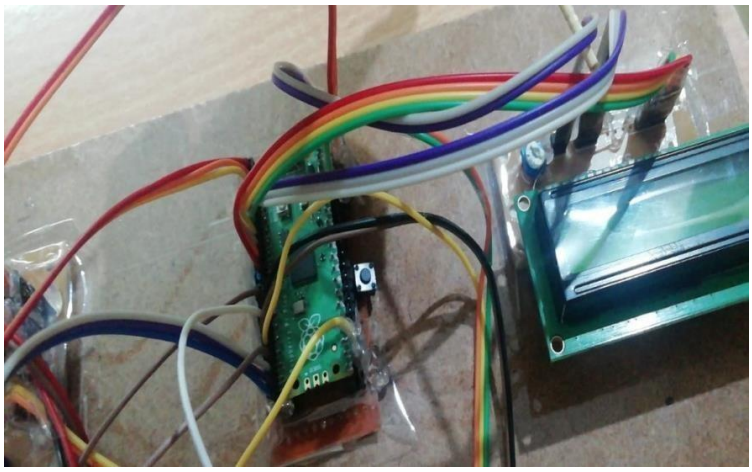
- The LCD pins D3, D4, D5, D6 are connected to the GP10, GP9, GP7, GP6



- Register, Read/Write, Engage are connected to the GP8, GP3, GP2,

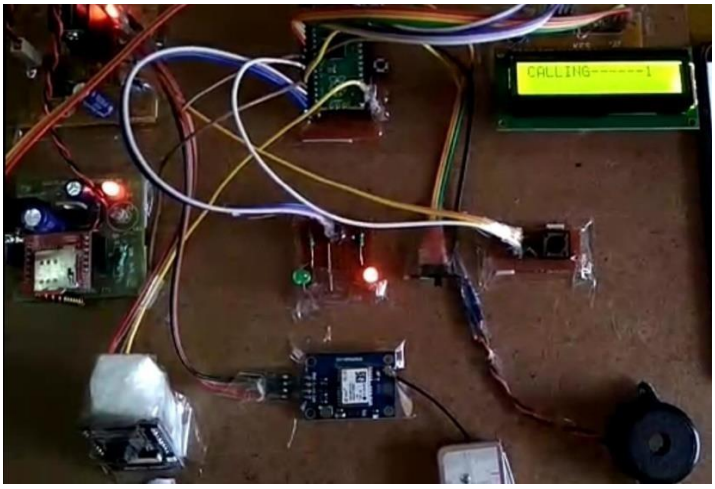


- Vss(GND), Vcc to the Vbus and Vsys



- Then insert the sim card and switch on the power supply.

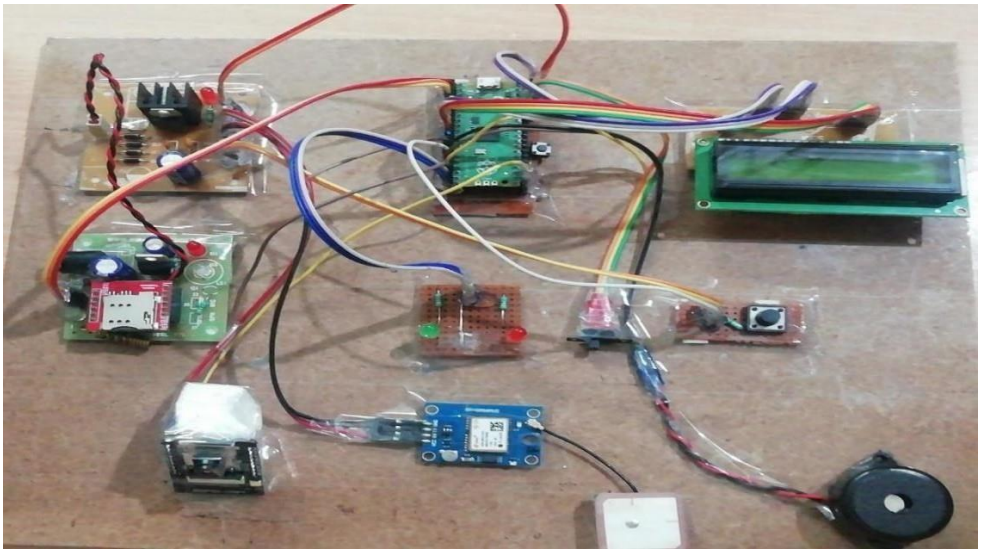
- The final components connected would look like this.



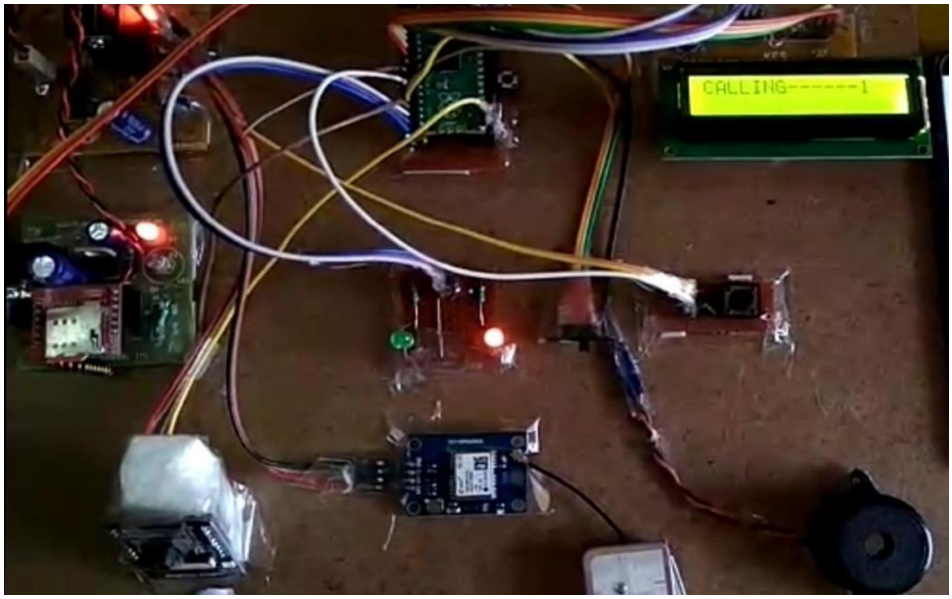
- Now if the woman finds herself in trouble she can press the button.
- After pressing the button the buzzer gives a loud noise as well as call alerts will be generated.
- After the message alert has been received by the one whom selected will get her proper and exact location.
- A call alert will also be sent to the 3 members she has selected.

7. OUTPUT IMAGES

7.1 BOARD BEFORE WOMAN PUSHES THE BUTTON

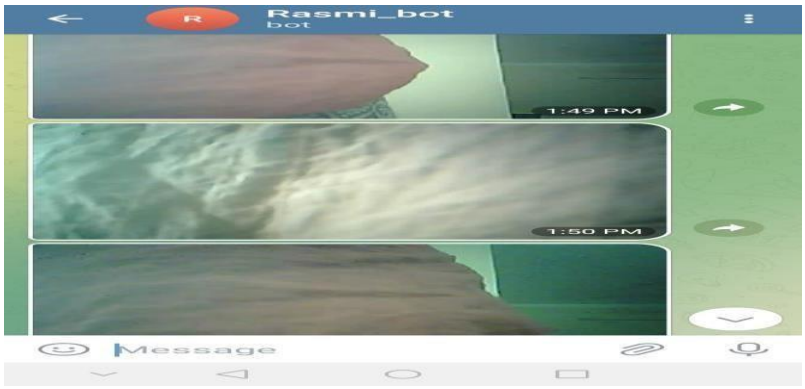


7.2 BOARD AFTER WOMAN PUSHES THE BUTTON



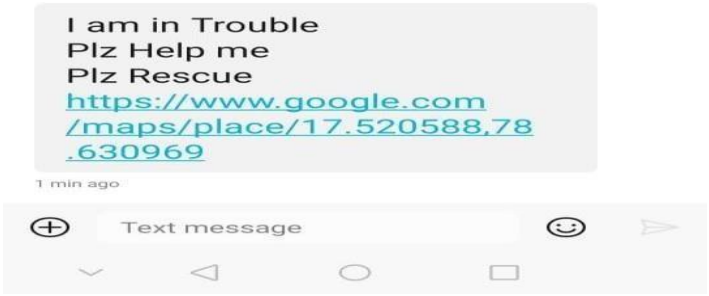
7.3 INTRUDER PICTURES ALERT

The pictures of the intruder (the person standing in front of the woman) will be captured in the pictures. These pictures can be also used as a proof for future purposes.



7.4 MESSAGE ALERT

Whenever the button is pressed, or the signal between the transmitter and receiver goes low, the location is tracked, and the tracked location is sent to the emergency contacts through SMS, as shown. It sends the location through SMS to the emergency contacts.



7.5 CALL ALERT

A Phone Call Component is added to the system to make a call to a contact in times of emergency issue. When the button is triggered, The Send Phone Call direct event automatically places the call, to that number.

8. CONCLUSION

This project describes the safety measures which will be needed when a woman finds herself in danger. Even though there are several laws that are undertaken by the government, the environment still does not provide the actual safe to women while they step out outside the house. Women are facing various kinds of sexual harassment in their workstations too. This system will act as a real-time helping agent to them. It provides 24*7 safety and security to them. This project covers various kinds of situations that women face nowadays. The device can either be activated manually by pushing the button. This system can be used in panic situations, accidents, fire alerts. One can send the alerts to the people either via button click. Due to the impact of social media on all ages of people from a child to the old aged, this system has an option to share the alert through the Telegram. This will be very much helpful in rescuing the victim and in arresting the harassers in the most effective way. In this system, one can send the latitude and longitude of their location as well as the street address. A siren sound gets starts to play, which will be very helpful in alerting the nearby people about the danger. Even teens and old aged people can use this application. It will provide a high-level safety and security measure so that one can feel secure when stepping out of their house and roaming around the world.

8.1 FUTURE ENHANCEMENT

This model can be additionally evolved further to a wearable gadget. The design can be made more compact and lighter in weight so that it can be easily portable, user friendly and we can make the button automatic by measuring the heart-beat of the woman. As well as share the details(captures) of the intruder on social media. In future, the system can also be interfaced with the Camera for capturing image and recording live video. We can interface this system using smart phone or mobile.

9. BIBILOGRAPHY

9.1 BOOK REFERENCES

- Diffenderfes, Robert (2005). Electronic Devices: System and Applications. New Delhi:Delimar.p.480.ISBN 978-1401835149.[2]. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay.
- "The 8051Microcontroller and Embedded Systems using Assembly and C", Second Edition.

9.2WEBSITE REFERENCES

- Ahir, S., Kapadia, S., Chauhan, J., &Sanghavi, N. (2018, January). The Personal Stun-A Smart Device For Women's Safety. In 2018 International Conference on Smart City and Emerging Technology (ICSCET) (pp. 1-3). IEEE.
- Sogi, N. R., Chatterjee, P., Nethra, U., & Suma, V. (2018, July). SMARISA: A Raspberry Pi Based Smart Ring for Women Safety Using IoT. In 2018 International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 451-454). IEEE.
- Navya R Sogi, Priya Chatterjee and U Nethra, "SMARISA: A Raspberry pi based smart ring", International Conference on Inventive Research in Computing Applications (ICIRCA 2018) IEEE Xplore Compliant Part Number: CFP18N67-ART, 2018, ISBN 978-1-5386-2456-2-samarisa.
- Muskan Teena, Khandelwal Manisha, Khandelwal Purnendu and Shekhar Pandey, "Women safety device designed using IOT and machine learning", IEEE SmartWorld Ubiquitous Intelligence & Computing Advanced & Trusted Computing Scalable Computing & Communications Cloud & Big Data Computing Internet of People and Smart City Innovations, 2018.

9.3 TECHNICAL PUBLICATIONS REFERENCES

- Sriranjini, "GPS & GSM based Self Defence System for Women safety", Journal of Electrical and Electronics Systems, Volume No.06, pp[03], 2017.
- Remya George And Anjaly Cherian, "An Intelligent security System for Violence against women in public places", International Journal of Engineering & Advanced Technology, Volume No. 03, pp[05], April 2015.
- Premkumar, Ravivarma and Sharmila, "One Touch Alarm System For Women's using GSM", International Journal of Science,Technology , Volume No.01,pp[04], March 2015.
- Pooja Kabsud and Vishnu Suresp, "Innovative Embedded Shoe Design for Women Safety", Volume No.08, International Journal of Engineering Research .

10. APPENDICES

10.1 INSERTION OF SIM CARD

10.2 CREATE A BOT IN TELEGRAM

Create a Telegram bot with BotFather before connecting your bot to Telegram.

- Start a new conversation with the BotFather
- Send /newbot to create a new Telegram bot.
- When asked, enter a name for the bot.
- Give the Telegram bot a unique username. Note that the bot name must end with the word "bot" (case-insensitive).
- Copy and save the Telegram bot's access token for later steps.