A Novel Rescue System Framework for Women Safety Using IOT

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Abstract: Today, women are highly vulnerable in public places since they are targeted by anti-social elements. There is an urgent need to develop a smart phone based technology to track the culprit with the geographical identification of the incident along the photo identification. The application sends an alert message using GSM, with the person’s location to the configured group through the GPS and the captures image of the incident. The application is triggered when emergency button is pressed, in a distress situation. It can also be used in case of accident, health emergency and chain snatching. Accident alert is triggered by the sudden variation in the piezoelectric vibration sensor value which considers the orientation and angular velocity of the victim. Chain snatching alert is triggered by the sudden cut of the wire through LMRDF which is used for the interaction between the Arduino and the wire. The users are required to submit personal details such as email id and emergency contact numbers.

Keywords: GSM, GPS, Emergency button, accident alert, chain snatch alert, heartbeat alert.

I. INTRODUCTION

Safety is the most wanted power for everyone in today’s world. Technology is the best way to achieve it. That’s the reason to develop this project that can act as a rescue device and protect at the time of danger. The motivation behind this project is an attempt to focus 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. An advanced system can be built that can detect the location and health condition of person that will enable us to take action accordingly.

The application sends an alert, with the person’s location to the configured group through the Global Positioning System (GPS) and the captured picture of the incident is stored in an external remote server. The application is triggered when change in heartbeat is sensed, in a distress situation can deliver a text message to the configured contact group, seeking help and indicating the user’s location along with the photograph of the incident. It can also be used in case of attempted molestation, accident, family emergency and chain snatching. This application can also be used by a person who witnesses the incident. The users are required to submit personal details such as email id and emergency contact numbers. The users can configure their own list of contacts including close relatives and friends.

II. EXISTING SYSTEM

The existing system provides the mechanism to track the victim but no other emergency mechanism is proposed. It is difficult to capture the culprits and track victim’s location. It is difficult for communication among the sensors. It is difficult to track/know the victim’s health condition. Data monitoring is tedious job.

III. PROPOSED MODEL

The proposed prototype can be turned ON by the activation of pulse rate sensor. When the pulse rate is reached the threshold value they get activated. Pulse rate works at both the ranges namely even above threshold limit and also below the threshold limit. Both the values are programmed in such a way by means of Arduino. By activation of sensor makes the camera to turn ON and it starts capturing images in burst mode. Images captured are sent to the contacts and it starts sharing images to the contacts as well as mail and plays a voice alert for emergency alerts. Emergency button is used if there is any emergency. If the person is not in the position to press the button then the emergency button will automatically ON. Chain snatch alert is used so that if a culprit try to snatch their chain the emergency alert message will be sent and the culprit image will be captured.
IV. SYSTEM REQUIREMENT

1. Arduino Uno
Arduino is an open source prototype platform used for building electronics projects. It consists of both a physical programmable circuit board and a software or IDE that runs on our computer, where you can write and upload the computer code to the physical board.

2. Heartbeat Sensor
Heartbeat sensor is an electronic device that is used to measure the heart rate, blood pressure are the basic things that we do in order to keep us healthy.

3. Vibration Sensor (Piezo electric vibration sensor)
A Piezo electric vibration sensor is a device that uses the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain or force by converting them to an electrical charge.

4. Voltage Regulator
Voltage regulator is the device which will step down the voltage that is needed for the system. Here we are using LM317 voltage regulator. It will step down the voltage of into 5v which is needed to the system.

5. GSM SIM 800C
Sim800C is quad-band GSM module which is used in embedded application where the remote data transfer is required. It can also receive and transmit voice call, SMS with low power consumption. The module is controlled by using AT commands.

SEQUENCE DIAGRAM

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are sometimes called event diagrams or event scenarios. Also, A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place.
Figure 2: Sequence diagram for Android Application.

The user can install and register to the application and the application will send an alert notification along with voice note. The user can request for the victim’s location and the application will send an acknowledgement by sending the requested location using Global Positioning System (GPS). Also the user can request for victim for the incident location and the application will send back the requested resource using camera.

FLOW CHART

Figure 3: Flow chart diagram

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V. IMPLEMENTATION

#include <LiquidCrystal.h>
define emer 8
define chain 4

LiquidCrystal lcd(6, 5, 3, 2, 1, 0);
int data=A0;
int start=7;
int count=0;
unsigned long temp=0;
**INITIALIZE:**
void setup()
{
  Serial.begin(9600);
  Serial.println("AT");
  delay(1000);
  Serial.println("AT+CMGF=1");  //Sets the GSM Module in Text Mode
  delay(500); // Delay of 1000 milli seconds or 1 second
  Serial.println("AT+CNMI=2,2,0,0,r\n");
  delay(500);
  Serial.println("AT+CMGS=x+919901175953 \r"); // Replace x with mobile number
  delay(500);
  lcd.begin(16, 2);
  pinMode(data,INPUT);
  pinMode(start,INPUT_PULLUP);
  pinMode(emer,INPUT);
  pinMode(chain,INPUT);
}
void loop()
{
  Serial.println("press button");
  lcd.setCursor(0, 0);
  lcd.print("Place The Finger");
  lcd.setCursor(0, 1);
  lcd.print("And Press Start");
  if(digitalRead(start)==LOW)
  {
    lcd.clear();
    temp=millis();
    while(millis()<(temp+10000))
    {
      if(analogRead(data)<300)
      {
        Serial.println("place finger");
        count=count+1;
        while(analogRead(data)<300);
        lcd.clear();
      }
    }
    lcd.clear();
    lcd.setCursor(0, 0);
    count=count*6;
    lcd.print(count);
    Serial.println(count);
    lcd.print(" BPM");
    temp=0;
    delay(1000);
  }
}

**HIGH HEART RATE:**
if(count>75)
{
  lcd.clear();
  lcd.setCursor(0, 1);
  lcd.print("HIGH HEART BEAT");
  Serial.println("HEART BEAT HIGH "); // The SMS text will be sent
  delay(100);
  Serial.println((char)26); // ASCII code of CTRL+Z
  delay(500);
EMERGENCY ALERT:
if(digitalRead(emer)==HIGH)
{
lcd.clear();
lcd.setCursor(0, 1);
lcd.print("EMERGENCY");
Serial.println("EMERGENCY "); // The SMS text you want to send
delay(100);
Serial.println((char)26); // ASCII code of CTRL+Z
delay(500);
}

CHAIN SNATCH ALERT:
if(digitalRead(chain)==HIGH)
{
lcd.clear();
lcd.setCursor(0, 1);
lcd.print("CHAIN SNATCHED");
Serial.println("CHAIN SNATCH ALERT "); // The SMS text you want to send
delay(100);
Serial.println((char)26); // ASCII code of CTRL+Z
delay(1000);
}
while()

ACCIDENT ALERT
if(digitalRead(vib)==HIGH)
{
lcd.clear();
lcd.setCursor(0, 1);
lcd.print("Accident");
Serial.println("Accident "); // The SMS text you want to send
delay(100);
Serial.println((char)26); // ASCII code of CTRL+Z
delay(1000);
}
while()

VI. RESULT

Figure 1: Women safety system prototype.

Figure 1 shows the components and connectivity of women safety project.
Figure 2 shows the women safety alert application when the mobile number is given then location and photo will be sent to the guardian, police or hospital.

Figure 3 shows the women safety application when the mobile number is given then location will be shown.
Figure 4: Response application.

Figure 4 shows the women safety response application will be installed in women’s android. When the guardian request for the location and photo will be sent through this application.

Figure 5: High heart beat alert.

Figure 5 shows the high heart beat alert on the screen when the heart beat reaches the high threshold.

Figure 6: Chain snatch alert.

Figure 6 shows the chain snatch alert on the screen when the wire circuit is broken.

Figure 7: Emergency alert
Figure 7 shows the emergency alert on the screen when the emergency button is pressed.

VII. Conclusion

The proposed design will deal with critical issues faced by women and will help to solve them with technologically sound equipment and ideas. The merit of this system is that this not only provides safety, it also provides security by means of self-defense mechanism. The real-life implementation of the proposed system would greatly help in reducing the crime rates against women and also instills greater confidence in women who are required to endure in the outside world.

REFERENCES