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Design and Implementation of Women Safety System Using GSM and GPS

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ABSTRACT: The idea behind our project is that women should be free to live in the society without the fear of violence and attack. Normally human body temperature is around 98.6F (37°C) being stressed can also increase body temperature depends upon the farness when a women in danger situation automatically increase the body temperature when temperature sensor sense the increase body temperature it will be manually or automatically activate the system. . This detection and messaging system is composed of a GPS receiver, microcontroller and a GSM modem. GPS receiver track the exact location information from satellites in the form of latitude and longitude. The microcontroller receive the signal and processes this information once it activated, immediately send a SMS through GSM modem MCU send the alert message to the mobile number nearby police station. Our project system more effect, low cost implementation price and easy to carry for all locations worldwide.

KEYWORDS: IOT, Auto-configuration, GSM module, GPS, safety jacket, Electro shock circuit

I. INTRODUCTION

It is an accepted fact that brutal crimes against women are occurring in India daily. Now many Indians do not deny, or shy away from conversations relating to eve-teasing, sexual assaults or rape. What should women do in the wake of continuous attacks? This paper presents analysis review on the principles in the intelligent security systems with technology requirement and defence mechanism to build the awareness against crimes. Since the prediction of such incident is not possible hence to minimize the possibilities of physical violence by keeping all the required tools ready to safely escape from violence situation. This reduces the risk and brings assistance when needed.” There is one universal truth applicable to all countries and communities: violence against women is never acceptable, never excusable, and never tolerable”. This device uses GPS sensor along with GSM module, a shock generator and microcontroller PIC16F877A. In order to help and resolve the issues of women harassment we propose GPS based women’s safety device that has dual security feature. This device consists of a system that ensures dual alerts. In case a woman is harassed or she thinks she is in trouble, this system can be turned on by a woman, in case a woman even thinks she would be in trouble. The emergency button in the device helps women to send a location to the emergency person number saved in the device at the same time the person can view the location. Additionally, a defense circuit is used in order to generate a shock to defense to themselves. This device will prove to be very useful in saving lives as well as preventing atrocities against women. A specialized computer system, is a part of a larger system or machine. Typically, an embedded system is hosted on a single microprocessor board with the programs stored in ROM. Virtually all appliances have a digital Interface -- watches, microwaves, VCRs, cars -- utilize embedded systems. Some embedded systems include an operating system, but many are so specialized, that the entire logic can be implemented as a single program. Embedded systems programming is the development of programs intended to be part of a larger operating system or, in a somewhat different usage, to be incorporated on a microprocessor that can be included as a part of a variety of hardware devices. Several other definitions are: The combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a dedicated function. In some cases, embedded systems are part of a larger system or product, as in the case of an antilock braking system in a car. The specialized computer system which is dedicated to a specific task. Embedded systems range in size from a single

processing board to systems with operating systems (ex, Linux, Windows® NT Embedded) Hardware and software that forms a component of larger system and is expected to function without human intervention. Typically an embedded system consists of a single-board microcomputer with software in ROM, which starts running a dedicated application as soon as power is turned 'ON' and does not stop until power is turned 'OFF'. An embedded system is the combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device such as Household appliances, aircrafts, vending machines and toys.

II. EXISTING METHODOLOGY

With crimes against women in India (especially in metro cities) on the rise, ensuring their safety has become more important than ever. Although the government is taking steps for women's safety, technology can play an important part in it. The measures that have been taken so far for women's safety include the following innovations

III. PROPOSED SYSTEM

GPS function enables her exact location to be tracked when alerted. It's not an over complicated piece of tech, and for this reason it can be easy to afford and produced in mass fairly easily and cheaply. It's probably also a lot better than carrying a gun or other visible weapon. The proposed system describes a "GPS and GSM based women security system" that provides the combination of GPS device and specialized software to track the victim's location as well as provide alerts and messages with an emergency button trigger. The footwear enables the wearer to immediately protect herself whenever she feels she may be at threat from a perpetrator. This devised footwear can give up to 800 volts of electric shock whenever the girl touches it to the person who may be attacking her. The person will become unconscious for some time allowing the wearer to call for help. It is designed for women in particularly living in the rural regions where often phone lines do not work or there may be other restrictions with regard to having access to adequate means of safety. The person wearing the footwear cannot be electrocuted as they are insulated by the leather material. There could be health and safety issues and there may be a risk of harming someone excessively, then if it protects a woman from much further risk then this can only be a good thing. In the heel of the footwear, there is a transistor in which diodes, two switches, LED light connecting wires are placed.

3.1 GSM MODULE

GSM (Global System for Mobile Communications), is a standard developed by the European Telecommunications Standards Institute (ETSI). It was created to describe the protocols for second- generation (2G) digital cellular networks used by mobile phones. A GSM module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone



Fig No 3: GSM SIM800 Module

A GSM SIM 800 module is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs. GSM MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. SIM 800 is used to send the alert message to the family members. The MODEM sends back a result after it receives a command. For each operation it as own AT command. AT means attention command. The command is followed by 1 second time delay. Externally, it looks like a big package (0.94 inches x 0.94 inches x 0.12 inches) with L-shaped contacts on four sides so that they can be soldered both on the side and at the bottom. Internally, the module is managed by an AMR926EJ-S processor, which controls phone communication, data communication (through an integrated TCP/IP stack), and (through an UART and a TTL serial interface) the communication with the circuit interfaced with the cell phone itself If.

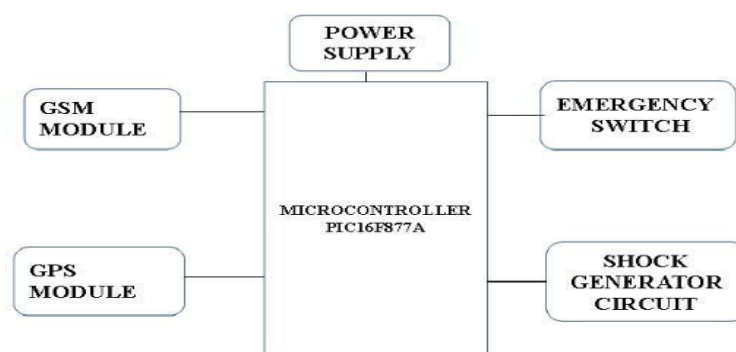


Fig No 4: GPS Module

It consists of internal RTC Back up battery and can be directly connected to USART of the microcontroller. The current date, time, longitude, latitude, altitude, speed, and travel direction / heading among other data, are provided by the module and can be used in a many applications including navigation, fleet management, tracking systems, mapping and robotics.

3.2 . POWER SUPPLY

The power supply unit is the part of the hardware that is used to convert the power provided from the outlet into usable power to many parts inside an electrical device. Every energy supply must drive its load, which is connected to it. Depending on its design, a power supply unit may obtain energy from various types of energy sources, like electromechanical systems such as generators and alternators, solar power converters, energy storage devices such as a battery and fuel cells, or other power supply. There are two types of power supplies existed, AC and DC power supply. Based on the electrical device's electric specifications it may use AC or DC power. Power Supply Range: 3 V to 5 V

- Ceramic antenna
- EEPROM for saving the configuration data when powered off
- Backup battery
- LED signal indicator
- Antenna Size: 25 x 25 mm
- Module Size: 25 x 35 mm
- Mounting Hole Diameter: 3 mm

3.3 Variable AC Power Supply

The different AC voltages are generated by using a transformer. The transformer may have multiple windings or taps, in which case the instrument uses switches to select the different voltage levels. Alternatively, a variable transformer (adjustable autotransformer) can be used to continuously vary the voltages. Some variable AC supplies are included

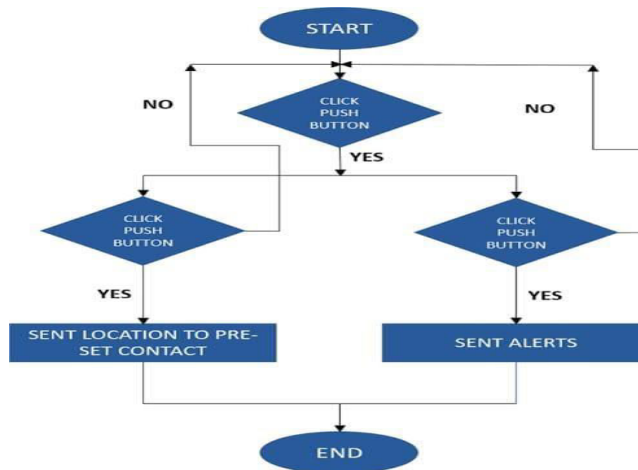


meters to monitor the voltage, current, and/or power.

Unregulated Linear Power Supply

- Unregulated power supplies contain a step-down transformer, rectifier, filter capacitor, and a bleeder resistor. This type of power supply, because of simplicity, is the least costly and most reliable for low power requirements. The main disadvantage is that the output voltage is not constant.
- It will vary with the input voltage and the load current, and the ripple is not suitable for electronic applications. The ripple can be reduced by changing the filter capacitor to an LC (inductor-capacitor) filter, and the cost becomes more.

FLOW CHART



SOFTWARE PROGRAM

```

#include <stdio.h>
#include <EEPROM.h>
#include <SoftwareSerial.h>
SoftwareSerial mySerial(2, 3); // RX, TX
const int led_Pin = 13;
const int input1 = A1;
const int input2 = A2;
const int input3 = A3;
const int input4 = A4;
const int input5 = A5;
const int output1 = 10;
const int output2 = 11;
const int output3 = 12;
int input1State = 0;
int input2State = 0; int input3State = 0; int input4State = 0; int input5State = 0;
int temp = 0, max_sms = 0; char mobile_no0[10] = {'\0'};
char mobile_no1[10] = {'\0'}; char mobile_no2[10] = {'\0'}; char mobile_no3[10] = {'\0'}; char mobile_no4[10] = {'\0'};
float n = 0.000000, n1 = 0.000000, n2 = 0.000000, e = 0.000000, e1 = 0.000000, e2 = 0.000000;
int call = 0, stops = 0, z = 0, flag = 0; char a[10] = {'\0'};
void gsm_init()
{
Serial.print("AT" );
Serial.print("\r"); delay(150); Serial.print("AT" );
Serial.print("\r"); delay(150);
}
    
```



```

Serial.print("AT+CMGF=1");Serial.print('\r');
delay(150); Serial.print("AT+CNMI=2,2,00");Serial.print('\r');
delay(150); Serial.print("ATS0=1");Serial.print('\r'); delay(150);
}
void read_mobile_number_sim()
{
int number_i = 0; int number_j = 0; char z[15] = {'\0'};
int exits = 0, flag = 0;do
{
Serial.print("AT+CPBF=\"NUMBER");Serial.print(number_j);
Serial.print("");
Serial.printexits = 0;
for(number_i = 0;number_i < 15;number_i++)z[number_i] = '\0';
number_i = 0;
flag = 0;do
{
if (Serial.available())
{
z[number_i] = Serial.read();
if(z[number_i] == "" && flag == 0)
{
flag = 1;
}
else if(z[number_i] == '+' && flag == 1)
{
//Serial.print(b[k]);
if(b[k] == 'E' || b[k] == 'W')exit = 1;
else
k++;
}
}while(exit == 0);
n1 = (float)(((b[0] - 0x30) * 10.0) + (b[1] - 0x30));
n2 = (float)((((b[2] - 0x30) * 10.0) + (b[3] - 0x30) +
((b[5] - 0x30) * (1.0/10.0)) + ((b[6] - 0x30) *
(1.0/100.0)) + ((b[7] - 0x30) * (1.0/1000.0)) + ((b[8] -0x30) * (1.0/10000.0)))/60.0);
n = n1 + n2;
e1 = (float)(((b[12] - 0x30) * 100.0) + ((b[13] - 0x30)
* 10.0) + (b[14] - 0x30));

e2 = (float)((((b[15] - 0x30) * 10.0) + (b[16] -
0x30) + ((b[18] - 0x30) * (1.0/10.0)) + ((b[19] -
0x30) * (1.0/100.0)) + ((b[18] - 0x30) * (1.0/1000.0))
+ ((b[18] - 0x30) * (1.0/10000.0)))/60.0);
e = e1 + e2;
//mySerial.print('c');
}
void setup()
{

Serial.begin(9600);
mySerial.begin(9600);
pinMode(led_Pin, OUTPUT);
pinMode(output1, OUTPUT);
pinMode(output2, OUTPUT);
pinMode(output3, OUTPUT);

```



```
pinMode(input1, INPUT);  
pinMode(input2, INPUT);  
pinMode(input3, INPUT);  
pinMode(input4, INPUT);  
pinMode(input5, INPUT);  
digitalWrite(output1, LOW);  
digitalWrite(output2, LOW);  
digitalWrite(output3,
```

3.4 . WORKING PRINCIPLE OF SHOCKGENERATOR CIRCUIT

- R1 along with the preset and the C1 determine the frequency of oscillation. R1 ensures that the transistor never comes within an unsafe zone while adjusting the preset.
- TR1 here is a small ferrite core transformer built using the smallest EE type of ferrite core.

The winding inside the coil is calculated for working with 3V DC supply, meaning the circuit becomes compatible with a 3V battery pack made by putting a couple of AAA cells in series .When power is applied to the circuit, the transistor and the center tapped transformer instantly start oscillating at the specified high frequency. This forces the battery current to pass across the TR1 winding in a push pull manner. The above switching generates a proportional induced high voltage across the secondary winding of TR1.As per the winding data, this voltage could be somewhere around.

IV. EXPERIMENTAL RESULTS



VIII. CONCLUSION

It can be concluded that the system helps to supports the gender equality by providing safe environment to women in the society, and allows them to work till late nights. The proposed system provides the tool for intrusion detection



inside the home where senior citizen, handicapped person or women leaving alone and after detection of intrusion it takes necessary preventive measure action to ensure safety. When a woman feels insecurity, she can press the emergency key which activates the self- defense circuit. Their accurate location is captured by the GPS module (navigation). GSM module thus sends the location information emergency message to the saved contacts. This circuit has another emergency switch thus activates the shock generator that produce non-lethal shock to deter the attacker.

IX. FUTURE SCOPE

As the technological changes or new requirement from user to enhance the functionality of product may requires new version to introduce. Although the System is complete and working efficiently, new modules which enhance the system functionality can be added without any major changes to the entire system. By keeping this ability of the product in mind, an incremental process model has been used to design and develop the system. Among the various modules few are identified, which couldn't be included in the last increment due to time constraints. These are as follows.

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