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Advanced Women Security System

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ABSTRACT: Even though the world has grown big in all means and literacy rate hits almost 100% in many places, atrocities towards women are seldom happening everywhere. Nowadays women have to work independently to support their family and it is not rare that at least a few percent are assigned with overtime jobs. The security issue for such women comes forward because cases of harassment and rapes are increasing day by day. According to census rape is the fourth most common crime against women. The main issue associated with these cases by the police lies in constraints preventing them from responding quickly to calls of distress. The main constraints include not knowing the location of the crime, self-protection for women safety, women who is unable to inform about crime to anyone and so on. In order to overcome this situation the best suitable system for providing safety will be a portable device which the women will be able to carry with them and easy to use. This portable device will generate an electric shock which will make the attacking person to get back. After generation of shock a message will be send to certain contacts stored with the help of Global System for Mobile communication (GSM) and location of those women is traced with the help of Global Positioning System (GPS). This portable device will provide a self-defense for the women at emergency situation.

KEYWORDS: Shock based defence system, GSM (Global System for Mobile communication), GPS (Global Positioning System).

I. INTRODUCTION

As women safety is not alone an issue but almost every individual is unsafe in this world whether it is a child, man, old aged people. Women safety is the major issue in India and all other countries. India is growing economically but still a lot of attention is needed in the cases like kidnapping or murder cases, the relatives of victim and police comes to know about the incidents after several days. Most of the security solutions are based on wearable technologies [1]. The wearable systems can perform many of the same computing tasks as mobile phones and laptop computers. The devices based on wearable technology will have some form of communication capability and that makes the user to access the information in real time. Some of the safety systems include watches, Suraksha Devices [2], key chains which produces alarm on single touch [3], mobile applications like Nirbaya [4], Vithu and devices that are designed to look like earring. There are several existing proposals. One among them is Women self Defense watch [5].

This system provides security during emergency situations which include GPS for tracking [6] and GSM. Here an emergency key is pressed during emergency situations which produce an alarm sound at the same time GPS tracks the location and sends emergency message to nearby police station and family members through GSM [7] for sending messages. Another women safety weapon is the pepper spray, the chemical compound included in this spray will irritate the eyes which cause tears and also it gives pain and temporary blindness as the women sprays towards the attacker. Similarly there is a safety electric sandal which provides electric shock after hitting with it. This results in immobilization or stun effect to the criminals for a few seconds which may produce a second thought in their minds. We introduce a better and friendly design of such a system that can stun the attacker with an electric shock as well as do its job as a communication device.

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II. RELATED WORK

For the security of women many solutions are available. In emergency situation, mobile phone can be the best protector of victim. Nowadays large numbers of women safety applications are available. All these systems are quiet handy and go a long way to keep victim safe and alert friends, family and police in distress situation.

1. Women Self- Defense Watch
This watch provide security during emergency situations with the help of GPS and GSM. When the emergency key is pressed the alarm gets activated for a specific duration.
2. Women Safety Shield Protection
This system enables user to take pictures which are then send to emergency contact list through SMS.
3. Ninja Spike Keychain
Basically a normal keychain which is weapon with ninja spike. Ninja spike is a sharp pencil size device, it can be used to harm the attacking person. This keychain fits perfect in between the fingers but not easy to use.
4. Abhaya
An Android Application which can be activated by a single click, whenever need arises. A single click on this app identifies the location of place through GPS and sent message comprising this location URL to the registered contacts.

III. SYSTEM DESIGN

Proposed model is a shock based defence system. The architecture of the proposed system as shown figure 1 consist of a microcontroller, emergency button, GSM, GPS, Digital vibrational sensor and a buzzer. In this proposed system two cases exist. When a lady feels that she is going to attack, she can press the emergency button to activate the system. Else if the attacker pulls the buckle of the belt, then the system will be activated and the buzzing sound will be produced to alert the surrounding [8]. In both cases, an electric shock will be generated around the belt and through GPS and GSM, location of the women is sent to the registered contact number.

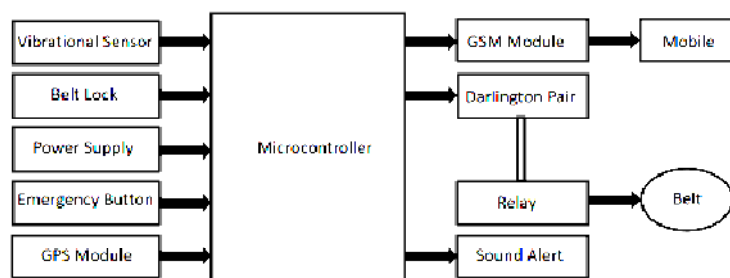


Fig 1: Block Diagram

The above figure shows the basic block diagram of the system. The software has accessed GPS and messaging services which is pre-programmed in such a way that whenever it receives an emergency signal it can sent help requests along with the location coordinates to the relatives and parents. So that we can take immediate action based on the situation.

IV. HARDWARE DISCRIPTION

The proposed system mainly consists of GSM and GPS module, digital vibrational sensor, buzzer and an electric shock device. In this device, the lady can activate the system by pressing the emergency button when she feels that she is in threat. The system will also activate when the attacker pulls the buckle of the belt. In such situation, an electric

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shock will be generated and at the same time, message will be sent to the registered number with the help of GSM and GPS module.

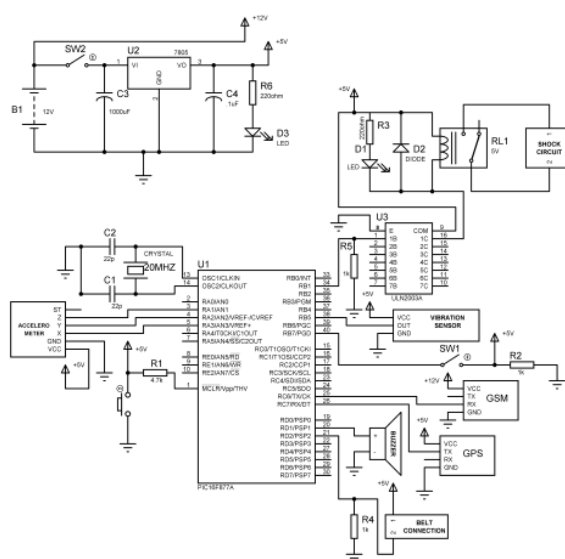


Fig 2: Circuit Diagram

The above figure shows the circuit diagram of the device. The description of each and every module in the system is explained below.

A. Power supply

Power supply provides the required power to the microcontroller and other electronic devices.

B. Microcontroller

The PIC microcontroller PIC16F877a is the one of the well-known microcontroller. This microcontroller is very easy to use and also the programming or coding of the controller. The main advantage of PIC16F877a is that it use flash memory technology so that it can be write and erase as many times as possible. It has a total number of 40 pins and out of 40, 33 pins for input and output. It consist of two 8 bit and one 16 bit timer. It also consists of serial and parallel ports.

C. Digital vibrational sensor

This is a highly sensitive vibrational sensor and it is mainly used as a security detector. When vibration is detected the sensor will output a low logic voltage. On-board potentiometer can be used to adjust the sensitivity. The sensor has extremely fast response time.

D. Relay

Relays are basically switches that work either electromagnetically or electrically. With the help of a signal relay can make or break contact in order to switch it ON or OFF. The main purpose of a relay is to control a high powered circuit with the help of a low signal. According to their use, relays are classified as power relays (contactors) or control relays (relays). Control relays are used in low power circuits.

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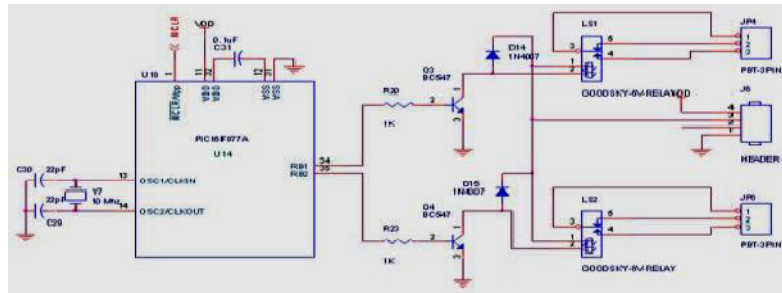


Fig 3: Interfacing Relay With Microcontroller

E. GPS Module

Global Positioning System compute position by using constellation of satellite and ground stations [9]. It can calculate the position and time almost anywhere on earth. The GPS receives the data sent from each satellite and accurately calculate the position and time. Along with the data it also receives timestamp from each visible satellite.

F. GSM Module

SIM900a GSM Module is used for mobile communication. GSM is used for transmitting mobile voice and data based on digital cellular technology [9]. It requires a SIM card and works on frequencies 850/900/1800/1900MHz. This modem helps to make audio calls, SMS, attend the incoming calls and read SMS.

V. SOFTWARE DISRIPTION

The software part of our proposed system is implemented in MPLAB IDE with high level assembly language (Embedded C). It is a software program that runs on a PC to develop applications for Microchip microcontrollers and digital signal controllers. It consists of one main program and many sub programs. One of the main program sample from the software MPLAB IDE is shown in the figure 4.

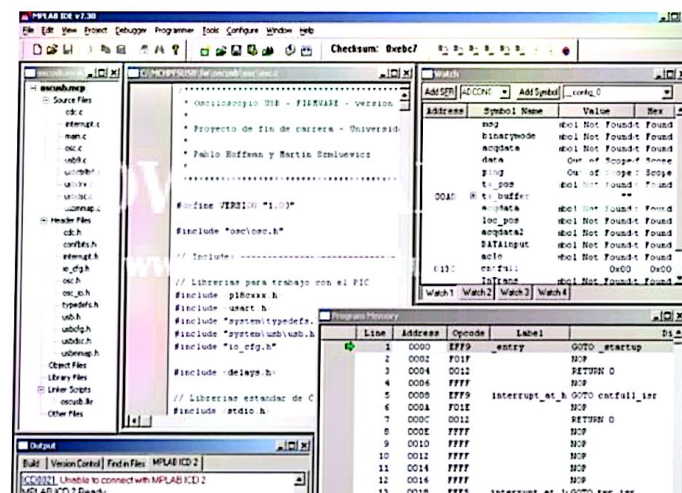


Fig 4: Embedded C programming in MPLAB IDE

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VI. RESULT AND SIMULATION

The design and hardware development of the women safety device using GSM, GPS and electric shock. First part of the project simulation is done by Proteus 8 professional CAD tool. This is a software tool suite which is used primarily for electronic design automation. The software is used mainly to create schematics and electronic prints for manufacturing printed circuit boards. The simulated hardware in Proteus is shown in figure 5.

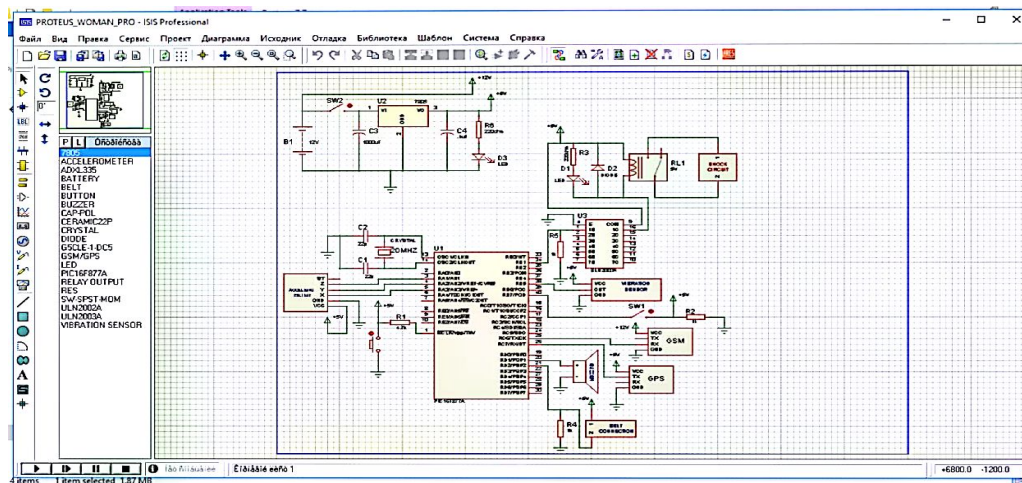


Fig 5: Proteus Simulation

After the simulation and correction the complete programme is burned to the PIC microcontroller using PIC KIT 3. Then simulated the full programme in the hardware and obtained the GPS location as result through the GSM. This location is received in the registered mobile numbers as shown in the figure 6. By using the latitude and longitude, location can be displayed on Google map and the correct location can be easily identified. So it helps to track the women and can take immediate actions.

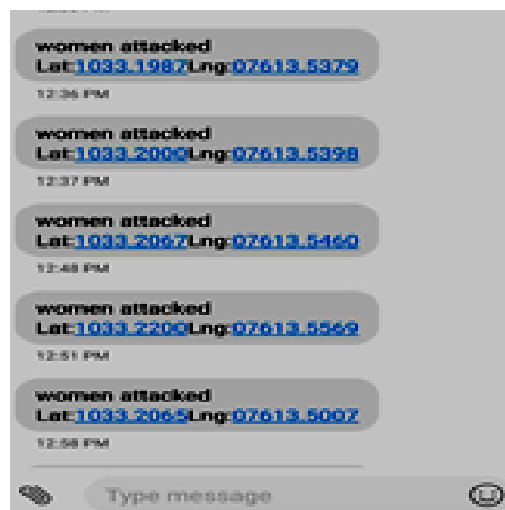


Fig 6: Alert message to registered number

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VII. CONCLUSION

This paper comes out with an innovative idea for security and protection for women. The device is found to be working properly by accurately sending co-ordinates of location and hitting someone who touches the belt with an electric shock. Using GPS and GSM module an alert message including the latitude and longitude value of location will send to the emergency contacts which are registered in the system shown in figure 6. By using the buzzer system, it also gives an alert to the surrounding people. Since we are using an electric shock, it could provide a temporary protection and it also helps to protect the women from sudden attacks. This system can overcome current women safety issues.

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