APP OPTIMIZED SAFETY DEVICE FOR WOMEN AND ELDERLY

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Abstract - *In this paper, a new approach for seeking help at distress situations is proposed. Nowadays, most elders are alone during daytime while they are being attacked the most and women work independently to support their family. For such women and elderly people, safety is the most important requirement as crimes against these people are on the rise. Best suitable system to provide help at earliest will be a portable system, which anyone will be able to carry with them and is easy to use. Portable system will generate a shock to immobilize the attacker. After generation of shock along with sound to grab attention, distress message will be sent with the help of Global System for Mobile Communication (GSM) to the stored contacts and the location of the person could be traced with the help of Global Positioning System (GPS). The message will be sent to the nearby people who have the same devices and also to the person who have the app developed for this. App will indicate the position at which the attack is being taking place and provide directions to get there. The device is also capable of triggering the message at times when the person has fallen down or if it is a sudden attack using an accelerometer.*

***Key Words*: Women Safety, Portable System, Shock, Message, GSM, GPS**

1. INTRODUCTION

Women safety device is a security device specially designed for women and elderly in emergency and in distress. It is simple and easy to use and carry, with various functionalities. The number of smart phone users is turning into greater in amount all over the world. App in the smart phone which is linked with the safety device has many applications which is useful to people. It is a personal safety product designed to keep everyone safe. It is packed with features for both everyday safety and real emergencies, making it an ultimate tool for all.[1]

1.1 Principle of Operation

It is a user-friendly device, which can be triggered by an inbuilt or remote switch. People who have only the app installed (don't have device) could sent the distress message by pressing a button in the app. Our intention is to provide a system with fastest and simplest way to contact your nearest help. When the button in device is triggered, the message is sent to pre-stored contacts and checks for a similar device or for a person with an app installed so that the message is sent to both device and app of the nearby people. The location of the person who is at distress is plotted on the map in the app when the message is received by the app and the location is shown in similar devices. The device also has an electric shock, which is activated when the trigger button is pressed to immobilize the attacker.[2]

2. WORKING

The device consists of two parts mainly the messaging system and the shock system for security purposes of the individual. The shock system will only activate in case of emergencies when the trigger button is turned on in the device. The message is sent through three different ways simultaneously to get help as soon as possible to reduce the impact of the emergency situation.[3]

First way of sending message is through the device to pre-stored contacts through GSM with the location of the person who triggered the alert button. The location will be displayed along with the message on the recipient's phone. Second way of sending message is by making use of ZigBee to send the distress message to the person who has the similar device and is nearby to the person in emergency situation.[3]The location of the person in distress situation will be displayed on the screen of the person who has the similar device. Third way of communication is by making use of Bluetooth to detect the smart phones which has the app installed, near to the person in dangerous situation and sending the location with a help message to it. The location of the person is plotted in the app so that the location could be easily understood and help could be provided to the person at that place.[4]

The device also comes with an emergency button integrated into the car remote key (could be also made as ring, bracelet, etc.) so that the device need not be carried. When the button is pressed, the message will be send through the three different ways to get help.
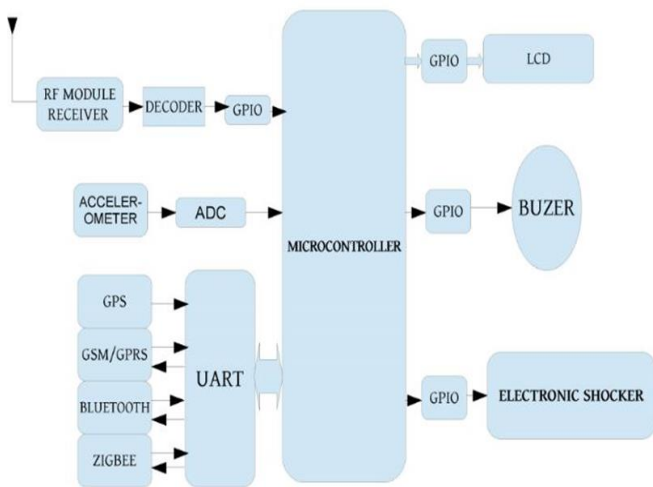

Fig -1: Block Diagram

The device also has accelerometer to detect the fall of the person and to automatically send the help message through three di errant ways to get help. When the person falls down the device gets triggered automatically and it is very helpful for elderly people to get help when they fall down.

2.1 COMMUNICATION MODULES

1. GPS - Global Positioning System is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations. A simplistic explanation: GPS uses these man-made stars as reference points to calculate positions accurate to a matter of meters. It is used to send the location of person who is sending the distress message.

2. GSM/GPRS - GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. It is used for sending message to pre-stored contacts.

3. Bluetooth: A Bluetooth module is usually a hardware component that provides a wireless product to work with the computer; or in some cases, the blue- tooth may be an accessory or peripheral, or a wireless headphone or other product. In our device it is used to communicate between Mobile application and the safety device.

4. ZigBee – It is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. The Zig-Bee standard operates on the IEEE 802.15.4 physical radio specification and operates in unlicensed bands including 2.4 GHz, 900 MHz and 868 MHz. It is used for device to device communication in the project.

5. GPIO- General Purpose IO is the most basic method of communication between MCU and external world. These are done with what is called a PORT. Ports are nothing but a set of bits physically connected to PINs of Microcontroller and avail-able outside the chip.

6.UART-(Universal Asynchronous Receiver/Transmitter) It is the microchip with programming that controls a computer's interface to its attached serial devices. Specifically, it provides the computer with the RS-232C Data Terminal Equipment (DTE) interface so that it can "talk" to and exchange data with modems and other serial devices

3. CONCLUSIONS

The main goal of the paper is to propose a comprehensive and effective solution for the safety of people and also a self-defense system with built-in electric shock to protect the people against attackers. The device can detect whether a person has fallen down to send the message to get help. The main applications of the project are safety for people in emergency situations, providing help to people at times when they get injured through accidents and no one is there to help them especially at times of night or in less populated areas, can be used to identify the location when the person is being abducted or kidnapped, deliver help at the earliest. The device could be used to reduce the intensity of crime. Timely help could be provided at times of emergency and fear could be instilled in the minds of people so that the crime rates could be lowered. Living standards could be improved by ensuring safer and secure living in society through the developed safety device

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