

Safety Belt for Women and Child from Unwanted Threats

Mr. Shakil Shaikh¹, Gadekar Rameshwar Dnyaneshwar²,
Dive Nitin Rajendra³, Rakte Chandrakant Dagadu⁴

¹Professor, Department of Electronics Engineering, Pravara Rural Engineering College, India

^{2,3,4}Professor, Department of Electronics Engineering, Pravara Rural Engineering College, India

Abstract

This research paper presents a women's safety belt equipped with various features for enhanced security. The belt incorporates a GSM module for message communication and a NEO-06 GPS module to obtain location coordinates. In addition, it includes a push button for distress signaling, sending text messages to parents and police authorities. The project also allows for location retrieval by sending a fetch location message. The safety belt is battery-operated and designed to consume minimal power. Furthermore, the system can respond to specific messages, such as "0000," by sending location coordinates to the requesting number. The effectiveness and practicality of the women's safety belt are demonstrated through its implementation and evaluation.

Keywords: women safety, safety belt, location tracking, emergency alert system, GSM module, GPS module, distress message, parents, police authorities, push button, battery-operated, personal safety, technology, women's safety, emergency situations.

1. INTRODUCTION

The safety of women has always been a major concern in our society, and there have been countless efforts made to address this issue. As a response to this concern, my project aims to create a safety belt for women that not only provides physical protection but also alerts the authorities and the victim's parents in case of an emergency. The safety belt will be equipped with GPS technology, which will enable it to send the location coordinates of the victim to the parents and the police. This will help in the timely response of the authorities and ensure the safety of the victim. With this project, I hope to contribute towards creating a safer environment for women and provide them with a sense of security when traveling alone.

2. LITERATURE REVIEW AND OBJECTIVE

Glenson Toney et al. performed [1] propose a system initiated by a human action. It is also given with an option of switch button and a fall detector to activate the system. The armband would have a controller with GSM/GPS kit interfaced. An alert, the person can be tracked. The system is designed also to be used as an alert system during medical emergency. Fathima Jabeen et al. learn performed [2] The armband incorporates a switch as an option to turn ON the system when one feels threatened. A switch can also be used during medical emergency and a Reset button too. The prototype also includes a fall detection sensor in the armband. Puneeth S et al. performed [3] . Say detect a fall and send message or alert on turning ON

the app. Another drawback here is that most of these have to be initiated manually, If the victim has a degree of freedom to turn ON the system, then a simple switch can be used to turn the system ON. When a person is attacked or in a dangerous 978-1-4799-8371-1/15/\$31.00 c 2015 IEEE 3008 situation, and cannot press the switch a gesture of hand (movement of wrist) will be sensed by the Flex sensor. Jijesh J et al. performed [4] More accidents occur for women, children and elderly people who always feel that they need the support to move around. With the help of advanced technology individuals can make use of a simple gadget which can be used whenever they are in unpredictable circumstances to establish connectivity between police and family The device designed is a portable one which can be activated as per the requirement of the individual which will locate the victim using GPS and with the help of GSM emergency messages can be sent to the respective locations as per the design. Basavaraj Chougula et al. performed [5] This paper suggests a new perspective to use technology to protect women. The system resembles a normal belt which when activated, tracks the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to three emergency contacts and the police control room. Poonam Bhilare et al. performed [6] This paper describes a GPS and GSM based vehicle tracking and women employee security system that provides the combination of GPS device and specialized software to track the vehicles location as well as provide alerts and messages with an emergency button trigger. Sridhar Mandapati et al. performed [7] In proposed system with the push of one button, people can alert selected contacts that the person is in danger and share the location. With this personal safety app, you'll never walk alone. Madhura Mahajan et al. performed [8] In this literature focus is on creating a safety system that brings about a solution that ensures both defense and creation of a seamless pathway to initiating legal procedures, if any; have to be taken by the victim. We intend to create a partial wearable that can provide a complete security solution and become a utility that eases the apprehension among women and their family members. Monisha, D. et al. performed [9] the proposed device is portable which has SMS options, screaming sensors and also defense element, thereby covering almost all needs. It can be more helpful by adding few more sensors like pressure sensors and detecting hidden cameras Asmita Pawar et al. performed [10] In our Country, even though it has super power and an economic development, but still there are many crimes against women.. Pratiksha Sagare et al. performed [11] This device is a security system, specially designed for women in distress. Method/Analysis: Using ARM controller for the hardware device is the most efficient and it consumes less power R. George et al. [12] This helps to identify protect and call on resources to help the one out of dangerous situations. Anytime you senses danger, all you had to do, is hold on the button of the device. B.T. Rosemary et al. performed [13] Force sensor and sends emergency messages using GSM (Global System for Mobile communication), to wireless SOS key contacts and the police control room. The main advantage of this system is that the user does not require a Smartphone unlike other applications that have been developed earlier. S Shambhavi et al. performed [14] Today in the current global scenario, the prime question in every girl's mind, taking into account the ever-rising increase of issues on women harassment in recent past, is only about her safety and security. The only thought haunting every girl is when they will be able to move freely on. Shubham Magi war et al. performed [15] The world is becoming unsafe for women in all aspects. The crimes against women are increasing at a higher rate. The employed women are feeling unsafe due to increasing crimes. This paper proposes a quick responding mechanism that helps women during trouble. When someone is going to harass, she can press the button that is attached to the device and the location information is sent as an SMS alert to few pre-defined emergency numbers in terms of latitude and longitude.

3. MATERIALS AND METHODS

3.1.1 ARDUINO:



Fig 3.1. Arduino nano

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. The Arduino Nano is a small Arduino board based on ATmega328P or ATmega628 Microcontroller. The connectivity is the same as the Arduino UNO board. The Nano board is defined as a sustainable, small, consistent, and flexible microcontroller board. It is small in size compared to the UNO board. The Arduino 17 Nano is organized using the Arduino (IDE), which can run on various platforms. Here, IDE stands for Integrated Development Environment. The devices required to start our projects using the Arduino Nano board are Arduino IDE and mini USB. The Arduino IDE software must be installed on our respected laptop or desktop. The mini-USB transfers the code from the computer to the Arduino Nano board. The technical specifications of the Arduino Nano board are:

- o The operating voltage of the Nano board varies from 5V to 12V.
- o The total pins in Nano are 22 Input/Output pins.
- o There are 14 digital pins and 8 analog pins.
- o There are 6 PWM (Pulse Width Modulation) pins among the 14 digital pins. The 6 PWM pins in Arduino Nano are used to convert the digital signals into the analog signals. The conversion takes place by varying the width of the pulse.
- o The crystal oscillator present in Arduino Nano comes with a frequency of 16MHz.
- o The Arduino Nano is used in various applications such as Robotics, Control System, Instrumentation, Automations, and Embedded Systems.
- o The projects created using Arduino Nano are QR Code Scanner, DIY Arduino Pedometer, etc.
- o We can also connect Arduino Nano to the Wifi.
- o The functionality of Nano is similar to the Arduino UNO.
- o The flexibility and eco-friendly nature of Nano make it a unique choice to create electronic devices and projects with compact size.

3.1.2 3.1.2 GSM Module:

3.1.3



FIG. 3.2. SIM800L GPRS GSM Module - Quad-Band TTL Serial Port- KG258

The SIM800L is a micro-SIM low cost GSM/GPRS Development Module. The Module supports TTL communication and hence can easily communicate with Microcontrollers without the need of additional data converters like MAX232. The module also supports antenna with IPX connector. SIM800L module can be used to make a cell, receive a call, send and receive text messages, connecting to internet through GPRS, TCP/IP, etc. Moreover, the module supports quad-band GSM/GPRS network, so it can operate globally. The SIM800L GPRS GSM Module is compact in nature and hence can be directly used on final Designs. The on-board LED indicates the connection status of the Board, when there is no signal the LED flashes quickly and when a signal is established, it flashes slowly.

3.1.3 GPS Module:

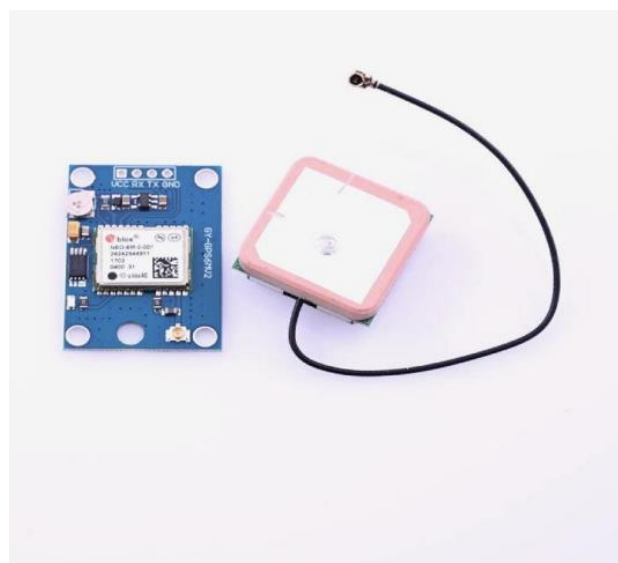


FIG.3.3.GPS MODULE

NEO-6MV2 is a stand-alone GPS (Global Positioning System) module featuring a high-performance 50 channel U-Blox 6 positioning engine. The NEO6MV2 GPS module checks for location on Earth and provides the Latitude and Longitude of the position it is in. This is a lowcost module with a detachable antenna, which also comes with a logic level converter and a voltage regulator, which makes it compatible with both 5V and 3.3V powered boards like Arduino Uno, Mega, Pro Mini, etc. It can be used in the Navigation Systems of Smartphones and Tablets, Drones, in location-based services, etc.

SPECIFICATIONS • Robust & high accuracy • Board size: 23mm*40mm • Compatible with 3.3V-5V interface • Compatible with all versions of Arduino • EEPROM to save configuration settings 20 • Separated 18X18mm GPS antenna • Support SBAS (WAAS, EGNOS, MSAS, GAGAN) • Maximum navigation update rate: 5Hz • Default baud rate: 9600bps • EEPROM with battery backup • Sensitivity: -160dBm • Supply voltage: 3.6V • Operating temperature range: -40°C TO 85°C To power the device, you can either connect your 5V pin or 3.3V pin to VCC and connect GND. As it communicates at 9600 bps via UART TTL logic, you need to connect TX and RX pins to respective pins on your controller and get the GPS coordinates of your position.

3.1.4 Vibration sensor:

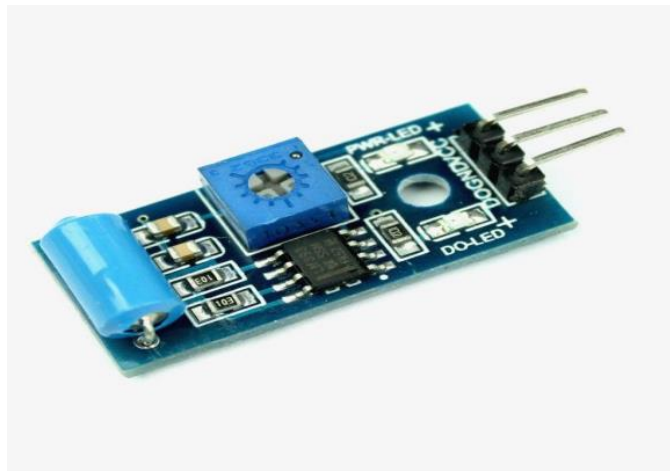


FIG.3.4 VIBRATION SENSOR

The SW420 Vibration Sensor Module is based on SW-420 Vibration Sensor, which works on the principle that when the movement or vibration occurs, the circuit will be briefly disconnected and output low. Hence the normal state of this sensor is closed. The sensitivity of the SW420 Sensor can be controlled by an onboard potentiometer and LM393 Comparator IC. This is very useful in detecting Collisions, Burglary protection alarm systems, Vibration alert systems, etc.

SPECIFICATIONS • SW-420 based sensor, normally closed type vibration sensor • Supply voltage: 3.3V-5V • On-board LM393 Comparator IC • The comparator output sensitivity can be changed with the help of a potentiometer. • Output form: digital switch output (0 and 1) • On-board indicator LED to show the results • Has a fixed bolt hole for convenient installation

3.1.5 Temperature sensor



Fig.3 .5. Temperature sensor

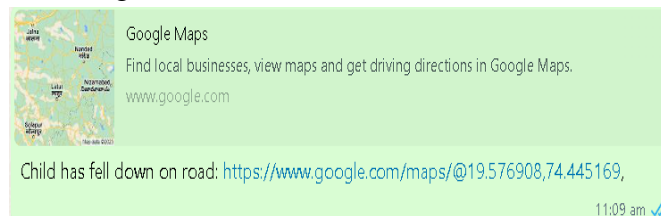
Temperature sensors are devices that detect and measure coldness and heat and convert it into an electrical signal. Temperature sensors are utilized in our daily lives, be it in the form of domestic water heaters, thermometers, refrigerators, or microwaves.

Result:

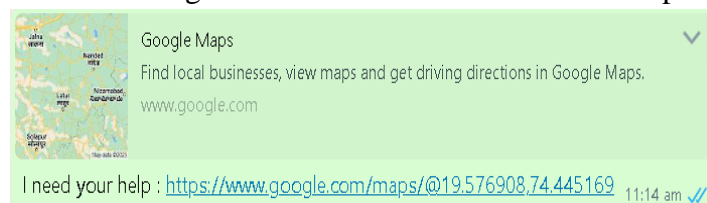
Analysis of the safety model's effectiveness in enhancing safety and protection Evaluation of the model's ability to address the specific needs of women and children Performance metrics and measurements obtained during testing Comparison with existing safety models or approaches

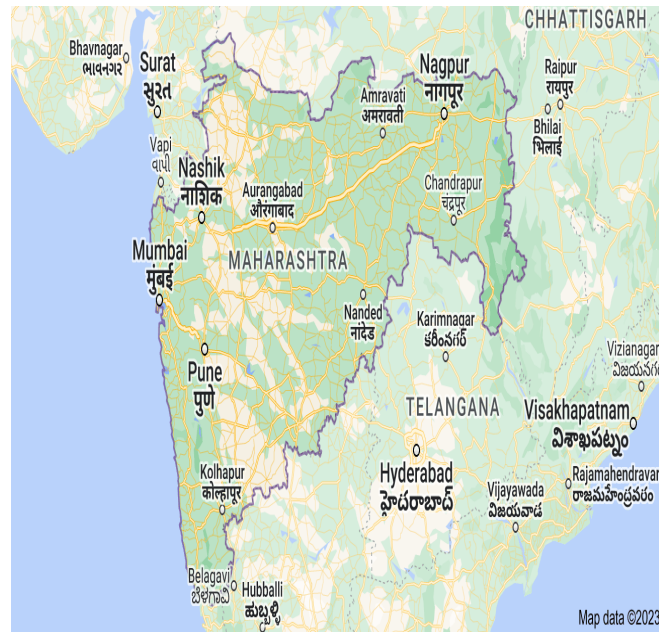


This message for child and women has fell down on road:



This message for child and women needs for help:





4 CONCLUSIONS

These days, children as well as adults are molested. In this paper, a system has been proposed to guarantee their safety and to provide security. Many researchers have been working in this field and have developed various technologies. In this paper, a self-defence device is suggested using these technologies, and by introducing new features, it is made more secure. The ability to operate a gadget without being physically close to it thanks to belt-mounted devices. The method enables multiple users to control device functionality, and the authentication feature it offers shortens the time it takes to fix errors.

This essay outlines the fundamental design idea, utility, and anticipated results.

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