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Smart Women Safety System with GPS Tracking and Emergency Alert for Bus

[1]Prof. Tambe S. P., [2]Bankar Vishal Bhimraj, [3]Girhe Gauri Sarjerao,
[4]Jagtap Sayli Arvind, [5]Sadaphal Rutuja Jalindhar
[1]Assistant Professor, Department of Electronic and Telecommunications Engineering
[2,3,4,5,]Students, Department of Electronic and Telecommunications Engineering
Ashok Institute of Engineering & Technology Polytechnic College, Shrirampur.

Abstract: *Women safety is a very important issue due to rising crimes against women these days.To help resolve this issue, we propose a GPS based women safety system 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 she even thinks she would be in trouble. It is useful because once an incident occurs with a woman she may or may not get the chance to press the emergency button. In a button press alerting system, in case a woman is hit on the head from behind, she may never get the chance to press panic button and no one will know she is in trouble. Our system solves this problem. This device is to be turned on in advance by a woman in case she is walking on a lonely road or some dark alley or any remote area.*

Once started the devices requires the woman to constantly press the button on the system every 1 minute, else the system now sends her location to the authorized personnel number through SMS message as a security measure and also sounds a buzzer continuously so that nearby people may realize the situation. In this case even if someone hits the woman or the woman falls down and get unconscious, she does not need to do anything, the button is pressed and it automatically starts the dual security feature. This device will prove to be very useful in saving lives as well as preventing atrocities against women. The device uses GPS sensor along with a GSM modem, LCD display, LED"s and microcontroller based circuit to achieve this system.

Keywords: *Women safety*

I. INTRODUCTION

This paper is based on women's security as it is reported that everyday there are many cases about women harassment. This is being reported that a woman is raped in every 18 hours in India. A 23-year-old IT professional, from Mumbai, was kidnapped from a busy sub-urban station and then raped and murdered. The police refused to register her case for several days and her body was found much later, mostly through the efforts of her own family.

Although an Android based application on Women security is already out in the market but for non-android users, we thought an idea for developing a project based on women security using Microcontrollers. In this project, a user can press a button that is located on the project with GPS and GSM technology using microcontroller. Once the button is pressed the microcontroller receives the signals from GPS system which has present location information and then the microcontroller allows the GSM system to send the Alert Message to the predefined numbers as "MY LIFE IS IN DANGER, SAVE ME AT ADDRESS BELOW" followed by GPS link. This project could be designed in small size and light weight something like mobile phone so that carrying it is not that problem.

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II. LITERATURE SURVEY

[1] Smart Foot Device for Women Safety," Institute of Electrical and Electronics Engineers, volume 16, pages 130–134, 2016, N. Viswanath, V. Pakyala,and G. Muneeswari. This study develops a sensible gadget for women's safety. The user will be able to covertly activate this smart device, which will be attached to their footwear. For the gadget to interact with the application, it needs to be associated with the user's smartphone. No unauthorized person may therefore connect to the device. Once every second, the device's acceleration sensor will detect the acceleration values in the x, y, and z axes. Upon receiving the warning from the gadget, a smartphone application is configured to transmit its location to four pre-specified contacts.

[2] M. Fathila, A. Helen, and R. Rijwana, "A Smart Watch for Women Security based on IOT Concept Watch Me," Institute of Electrical and Electronics Engineers, number 17, page 190-194, 2017This research presents a novel approach using smart watches. The "watch me" device's sensor detects a person's elevated heart rate at that precise instant and activates when a woman or child wearing it is the target of a sexual or vulnerable attack. The whole process is based on the fundamental idea of activating the heartbeat sensor upon reaching the desired heart rate and duration. Then watch me instantly notify the local police station of an incoming threat. Police can use GPS to track the position.

[3] G. Harikiran, K. Menasinkai, and S. Shirol, "Smart Security Solution for Women based on Internet of Things (IOT)," Institute of Electrical and Electronics Engineers, vol. 16, pp. 3551–3554, 2016.This method's suggested wearable "Smart band" can maintain continuous connection with a

Smartphone that has internet access. The application has been developed and is completely loaded with all the required data, which includes human behaviour and reactions to different situations, such anger, fear, and worry. The pre-installed app on the phone keeps track of all the information gathered by the smart band, such as the user's movements, heart rate, and body temperature. Installing the software on a smartphone allows users to access a social network and engage in real-time message receiving.

III. HARDWARE OVERVIEW

3.1 SYSTEM BLOCK DIAGRAM

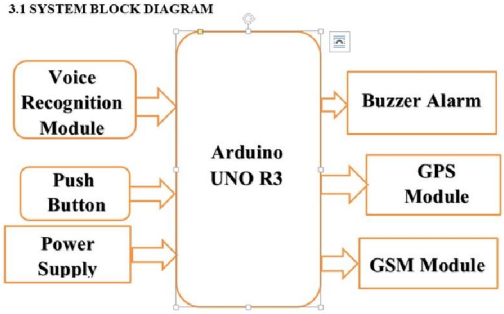

Fig. 3.1: Block diagram of system

The block diagram above represents the architecture of the proposed project “Smart Women Safety System with GPS tracking & Emergency alert for bus” system. The system consists of a microcontroller. This controller is Arduino Uno microcontroller, programmed to control and perform the desired operation of the designed system. This microcontroller is the brain of the complete system.The circuit requires a regulated power supply for the complete action of each component in the circuit. This requirement of power is fulfilled by the power supply unit in the system.

3.1. Block Diagram Description:

COMPONENTS

This projectis designed by following blocks

- Arduino Uno
- GPS Module

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- GSM Module
- Push Button
- LCD display.
- Buzzer

IV. CIRCUIT DIAGRAM

Components like the Arduino, GPS receiver, NODEMCU, shock module, and power supply are represented in the pin diagram. The Arduino is linked tothe components using the available pins, as shown in the illustration below

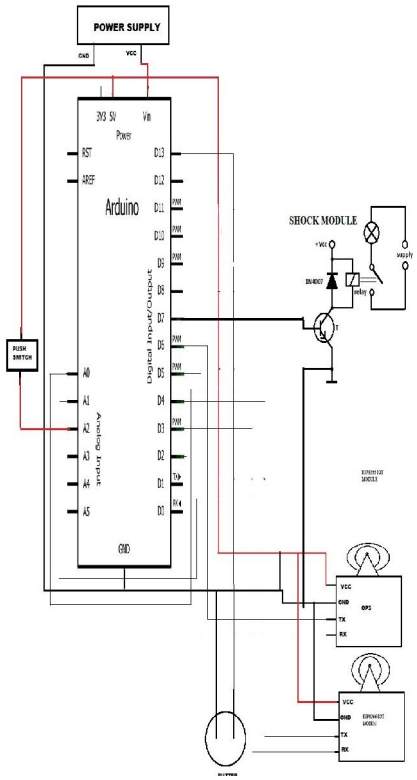

Figure4.1:CircuitDiagram –Smart Wearable Device

V. ADVANTAGE & APPLICATIONS

5.1 ADVANTAGES:

1. Real-Time Tracking and Location Detection

• Precise Location Sharing: The GPS module provides accurate latitude and longitude data, enabling law enforcement or family members to locate the bus immediately.

• Continuous Monitoring: Transport managers can track the movement of buses, ensuring they stay on scheduled routes.

• Geofencing: The system can trigger alerts if the bus deviates from a pre-defined route or enters an unsafe zone.

2. Immediate Emergency Alerts (SOS)

• Instant Distress Signal: A panic button/SOS button inside the bus or on a wearable device allows passengers to send an emergency alert instantly.

• Automated Alerts: In some systems, alerts are automatically sent if a sensor detects unusual movement, such as an accident or violent impact.

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• Multi-Recipient Notification: Distress signals can be sent simultaneously to pre-defined contacts, including family, local police stations, and a central control room.

3. Increased Security and Deterrence

• Crime Prevention: The presence of a visible safety system acts as a deterrent against harassment, assault, and other crimes in public transport.

• 4G Surveillance: Integration with 4G-enabled cameras provides live video feeds to control rooms, offering visual evidence of incidents.

5.2 APPLICATIONS

1. It will be used for safety of women's.
2. It will be used for child tracking during school time.
3. It will be used in vehicle tracking & safety system.
4. It can be used for wild life tracking.
5. It can be used as a legal evidence of crime with exact location for prosecution.
6. It can be used for the safety of physically challenged people.

VI. CONCLUSION & FUTURE SCOPE

a. CONCLUSION:

Being safe and secure is the demand of the day. Our effort behind this project is to design and fabricate a gadget which is so compact in itself that provide advantage of personalsecurity system. This design will deal with the most of the critical issues faced by women and will help them to be secure. Existing system provide the mechanism to track the vehicle but no other emergency mechanism is proposed. The proposed mechanism provides viewing the location of the victim in terms of latitude and longitude which can further be tracked using Google maps. The system helps to decrease the crime rate against the women. Women's Security is a critical issue in current situation. The crimescan be brought to an end with the help of real time implementation of our proposed system.

Security is the most important factor for safety of women. In this project we have discussed in details, how easily the women can be protected from harassments and rapes which are increasing day-by-day. As this system is wired system, in future it can be made wireless using Bluetooth, Another future scope is that, instead of using switches, we can also use sensors that can send the alert messages as soon as the woman touches the sensor with her fingers. This shall make the device authorized only to that woman, thereby reducing the chances of misunderstandings.

b. FUTURE SCOPE:

With the use of a smart device, this proposal developed a system for the security of women. When the button is pressed, the sensors gather user data, which is subsequently sent, together with a call and alarm message, to the predetermined number. With this system, there are the best prospects of lowering crime. To prepare for the occurrence, shock avoidance measures are used, and the alarm tone used for notification will support strategies for alerting antagonism.

This gadget might eventually be included in a smartwatch. By adding new features that weren't previouslyavailable, the integration ofthis gadget might improvethe capabilities of the smartwatch.

VII. RESULT

The result of all creation when the emergency button is pressed is shown in this diagram. It generates an automatic message with a pre-written emergency message to the pre- registered or defined contact.

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Visual and audio notifications, as well as a VoIP call to a predetermined phone number, would normally be the output of the women's safety gadget powered by an Arduino ESP8266 and equipped with a shock module. Here is a quick summary of the output:

1. Visual Alerts: When the shock module is activated, the gadget may include one or more LEDs that light up. It alerts the user and anybody nearby that the device has been activated and that she is in danger.
2. Audible Alerts: When the shock module is triggered, the gadget may have a buzzer or speaker that makes a loud noise. It alerts the user and anybody nearby that the device has been activated and that she is in danger.
3. Shock Output: When activated, the shock module will deliver a high-voltage jolt thatcan temporarily disable or dissuade an assailant.

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