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MOBILE APPLICATION TO ENHANCE WOMEN'S SAFETY USING BLUETOOTH DEVICE

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Abstract

Women's safety and protection are frequently their top concerns due to the rising tide of issues regarding Women's harassment in today's society. The seductive notion that she will be able to wander around freely on the streets even during regular working hours without worrying about being protected plagues every woman. This piece of writing serves as an example of how to use technology to safeguard Women. We present an idea that modifies the way everyone views on Women's safety. It's a success on a day when the media celebrates additional female harassment victories! Our concept addresses the need for a system that frequently detects victims and rescues them because people are unable to react appropriately in critical situations. In this research, a smart device for girls' protection is proposed that automates the emergency alarm system by routinely detecting a possible atrocity using outlier detection utilizing a heart-rate sensor. The device can deliver information at critical times without the woman's input due to her physical coordinates and its capacity to spot symptoms in pricey ones. When a crisis occurs, it immediately alerts the family and the local police station.

Keywords— Heart beat sensor, SOS Button, GSM, GPS, Internet of Things (IoT), Smart Device, Women Safety.

1. INTRODUCTION

The role that Women play in any financial system is crucial because it frequently determines how the United States of America will develop in the future. Numerous crimes against them go undetected as a result of society's hypocritical stance. Victims who try to hide their abuse from society often endure a variety of various sorts of humiliations and abuses. In India, the goal of only one out of every four trials is conviction. To produce the ideal solution to this issue, the proper safety measures must be taken. An IoT-based, fully intelligent wearable device for women's protection is suggested in this research. Such occurrences are robotically identified by the gadget and communicated to the appropriate persons. It ensures that the women will receive justice by not only letting them escape life-threatening situations but also by helping them when they are in need.

2. Related Work

[1] Discuss the use of a heartbeat sensor to automatically detect a risk in a likely scenario and notify immediate relatives and friends via a mobile app. [2] advises using photo editing to identify any prospective threats and suggests an offensive plan for herself. There is an advanced technology in [3] that depends on facial abilities. When a risk-based expression dominates the facial features, a file is opened. In order to put together a comfortable tool, GSM and GPS are employed. With the use of this tool, messages are sent to pre-saved mobile numbers while also containing information about the patient's posture and location. Synchronized Bluetooth is reportedly utilized to turn on both the android OS and the arm device, according to [5]. The data, which includes the audio and video that have been recorded as well as the position data in the form of a call and an alert message, are supplied to the mobile phone numbers that are probably pre-programmed inside the software. The location of the woman who is in danger is provided in [6], a smart Android software that also provides the location, first aid guidelines, and resources for making fake phone calls. The use of sensors to track bodily tremors, heart rate, and temperature is described in [7] as a reliable safety equipment that combines a controller with an Arduino device and a smart sensor. Three sensors are specifically utilized in [8], including the accelerometer, temperature, and heartbeat sensors. By using the GPS and GSM module, these ones assist in locating anomalies and send messages to warn the expensive ones.

3. System Design

There is no safety precaution for girls in the current system, not just during the day but also at night. Women's safety wasn't a concern in former times, and it was challenging to track them. The simplest statistics transfer from point to point is used in the currently available equipment for the usage of Bluetooth and WI-FI. They can ask for assistance the simplest way possible by texting their friends and relatives from their cell phones. The majority of the girls find it challenging to grab their phones at that critical moment. Even if they do, it is difficult to communicate swiftly before something tragic occurs. The following are some drawbacks of the current system:

- There is no mechanism that instantly assists women in emergency situations.
- There is no automatic system in place to respond immediately to protect women.

Our product is a wearable with a buzzer, a heart-rate monitor, and an SOS button made exclusively for women.

3.1 Block Diagram

The tool's basic diagram and all necessary additions are shown in Fig. 1. This device's brain is an ARDUINO MEGA (ATmega2560) microcontroller, which holds all of the software documentation. Women can manually engage the device to see if they are in an emergency by activating the heartbeat sensor, which is used to recognise the particular position that women find themselves in. Using the RF-based wireless module ZIG BEE, the GPS module can be used to locate each character's location, enabling that character and the appropriate public service agency to take swift action to stop women from being assaulted. Women can send messages or a specific person's name using the GSM. Even though we frequently utilise an alarm tool to alert people to the emergency scenario, the item includes a neuro stimulator for women to use in an emergency to attack again.

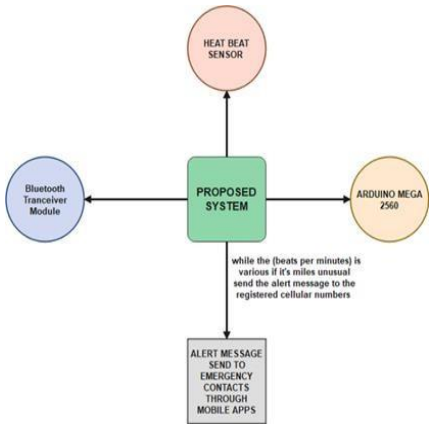

Fig. 1 Proposed System Block Diagram

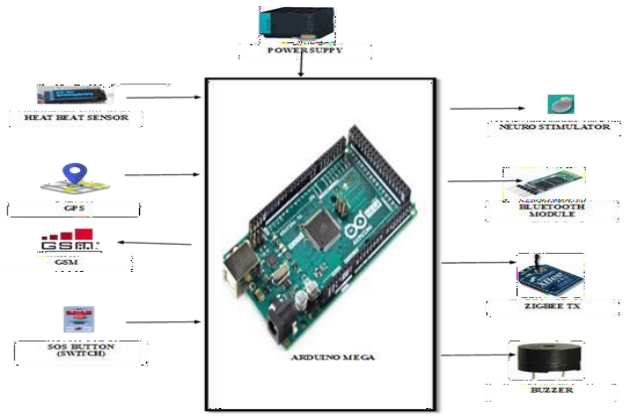

Fig. 2 The Prototype of the Proposed System.

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3.2 Components

The prototype uses the following, from Figure. 2, The Heartbeat sensor, a phototransistor and a potent infrared (IR) LED are used to detect the heartbeat of a finger; in response to each pulse, a red LED flash, Figure. 3. Following is a description of how a pulse display works: While the finger's blood pressure pulses, the phototransistor is utilised to collect the flux that is released. The phototransistor's resistance can be gently changed during this process. The LED is the finger's light-side component. According to our analysis of the project's schematic circuit, we chose a resistor R1 with an extremely high resistance since the phototransistor should be sensitive enough because the majority of the light coming from the finger is absorbed. Resistance can be determined using a test method to obtain fantastic results.

The defense against stray light hitting the phototransistor must be kept as tight as possible. This is particularly essential for household lighting because the most important home lighting is based on the 50–60 Hz band, which means that even a slight heartbeat will generate a lot of noise.

Fig. 3. Heart Beat Sensor

Fig. 4.GPS-GSMmodule

Fig. 5. Buzzer

The GPS-GSM module: It gives the character's location in real time. Figure.4, Both are completed in this module using two different approaches. Quad-Band can be utilised by GSM. Satellite navigation is supported because of the GPS era. Two- way communication is performed at a substantially reduced cost as compared to two-way GSM modem satellite television for computers.

Buzzer: A PCB can be used to mount this little 5V passive buzzer. Figure 5, It is used to run the Audio Alert feature for virtual designs. The coil detail uses a 5-volt supply to operate and emits an audible tone.

Microcontroller: The Arduino Uno microcontroller Figure.6 is required for connecting various sensors, switches, and modules. It serves as a decision-making controller and is capable of gathering a range of signals from various special sensors and activating output sensors as required.

Power source: The controller is powered by a 12 V rechargeable Li-ion battery Figure.7, which is then used to power the sensors and other crucial parts.

Fig. 6. Arduino

Fig. 7. Battery

Fig. 8 SOS Button

SOS Button: When pressed, the SOS button makes contact with various components, triggering the warning system. (See Figure 8).

4. Methodologies

Three different mechanisms make up the process flow.

4.1 Manual mechanism

The float technique is physically applied Figure. 9, and it occurs when women are able to respond. The woman can press a button on it if she ever feels unsafe. When the trigger is pulled, the buzzer makes a loud noise that warns anyone nearby who can assist the woman. and the alarm goes off.

4.2 Automated mechanism

It's possible that the girl won't always be able to react and employ the guidance system. A heartbeat sensor Figure. 10 based only at a time when the heartbeat is different should be utilised to automate the procedure. If the heartbeat is unusual, send an alert message to the registered Cell Phone numbers and the closest police station; if it is regular, do

nothing. This system, which is represented by a flow chart, takes the heart rate as a starting point and then determines whether or not the situation is abnormal depending on that rate.

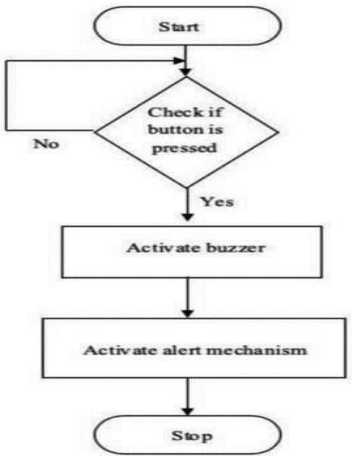

Fig. 9. Process flow for a manual mechanism

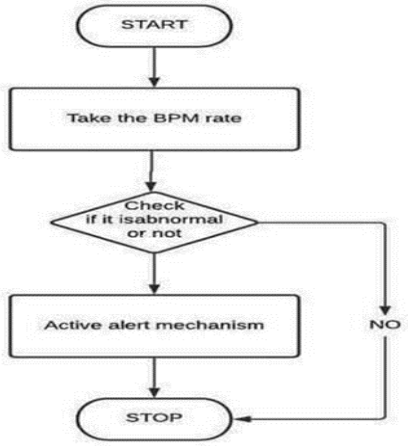

Fig. 10. Flowchart for an automated mechanism

4.3 Alert system

This technique is done out following the employment of one of the actions previously mentioned to address a risky situation. The victim's relatives and the necessary authorities are given a message with the victim's position when a GPS and GSM alert system is activated. It is straightforward to find the location thanks to a link to Google Maps. Figure 11 illustrates the precision of the tool shape of the warning system. The GPS receiver will always transmit the coordinates of the position whenever an alert mechanism is activated. With the use of satellite TV for PC TV for PC TV for PC, the GPS may find local coordinates. The coordinates for the location have been removed since they are difficult to see and have been replaced with a link to Google Maps. Once the coordinates are collected, the victim's location is added to a Google connection. To the listed phone numbers, this connection is sent over GSM.

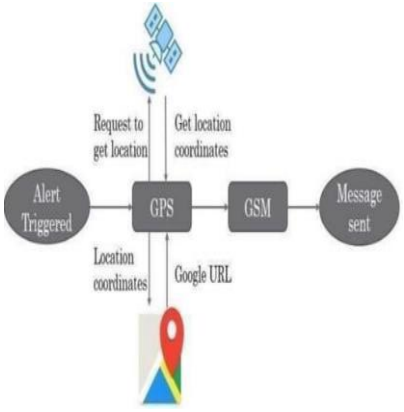

Fig. 11. System Design of Alert

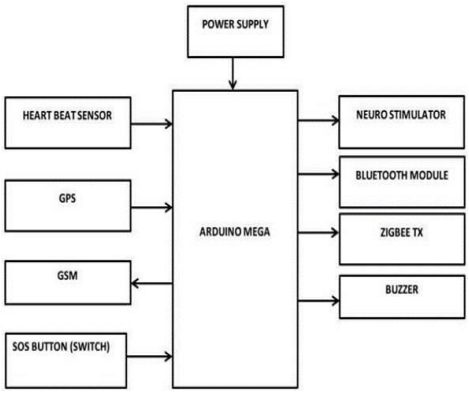

Fig. 12. Block diagram of the Prototype Mechanism

5. Results

Each of the components and modules needed to construct the component are demonstrated in Figure 13 below. The automatic mechanism's heartbeat sensor is tested in addition to the prototype, which incorporates additional potential technology such a GPS, GSM, and buzzer. When the victim presses the button when under threat, one of the pre-

programmed phone numbers Figure 14, for that particular cell receives an alarm message. The adaptability of the offered equipment is a major benefit. When human use of the gadget is allowed, it allows pressing a smooth button to start the warning mechanism; when reacting is not possible, it still uses a sensor to identify danger. The suggested instrument is also somewhat portable, environmentally friendly, and easy to maintain. Both understanding and use are simple. It's not required to have an internet connection. The location must meet quality standards and show signs of a mobile SIM card.

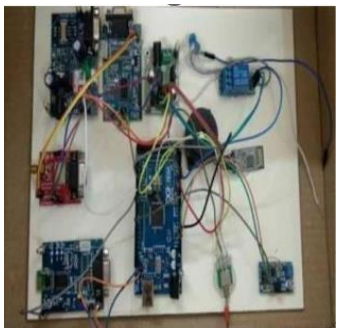

Fig. 13. Prototype

Fig.14.Message sent to user

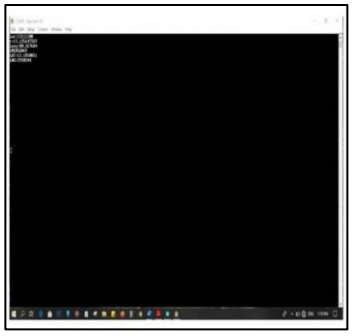

Fig.15. Alert message to nearby police station

Fig.16. Mobile Application

Fig.17. Short Message Service (SMS)

5.1 Experimental Results

Tera Term Output , Results, SMS Output

The Figure 15. shown the local police station with the alert message and its location. From Figure 16 shows the results in the application, Figure 17, the registered Cell Phone numbers were shown the alert message that was received.

6. Conclusion

The primary objective of developing a girl protection tool is to act as a rescue and stop harm during a dangerous situation, especially for women. A sophisticated emergency alert system automation tool for girls' safety is created by the proposed tool. Without the need for a girl's interaction during critical moments, this device detects and transmits

an alert for the pricey one with the location coordinates of the female. It automatically alerts the nearby police station and the immediate family group. Both computer bags and handbags are acceptable carrying options for the prototype. It is advisable to keep the prototype in one's luggage because even someone who wants to hurt someone might not be aware of the equipment within. This prototype may be altered using the customization process to become a variety of wearables, including smart watches, bracelets, necklaces, and many more. Our recommended device's main advantage is that it uses both an automatic and a guided mechanism. Additionally, it is easy to apply and has no experience fees. The suggested device might be modified to incorporate features like recording audio and video of the offender at the same time as the warning mechanism is activated so that it can be used as evidence in court.

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