

Smart Wearable Devices for Women Safety USING IOT

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ABSTRACT

The purpose of this device is to safeguard women in the event they might face any danger. The device uses wireless sensor network to communicate and to send alerts to them. The GPS and GSM are used to share the user's location directly to the relevant authorities and saved contacts. Safe let is a wearable female security device with two buttons on the side that can be used to send messages and contact parents. It also starts voice recording in sync with the user's mobile phone. Women are subjected to an increasing amount of harassment these days, which is troubling. The situation is extremely serious in both developing and developed countries. As a result, it poses a serious threat to women's empowerment as well as a country's fiscal development. We are developing IoT software and an Android app to make women's movement safer in this paper. By pressing the device's emergency button, women will receive immediate and comprehensive safety assistance. In the event of an incident, this system will monitor the user's location in real time and send it to a local police station and volunteer. This device will also provide the user with the location of the nearest safe zone. Furthermore, this interface can be used both online and offline. If the user does not have access to the internet, the computer can also be used to contact the nearest police station and volunteer assistance. Arduino uno, GPS, GSM, Bluetooth, and other components make up the system. The combination of both of these factors makes this product both inexpensive and simple to use.

Keywords: Women empowerment, IOT Software, Arduino UNO, GPS, GSM, Women safety.

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I. INTRODUCTION

Acts of abuse and assault against women have increased in recent years. As the number of female workers in industries and other sectors of the commercial market grow, it is becoming increasingly necessary for females to work late and travel to distant and remote locations. However, in recent years, the exponential rise in attack and abuse against women has posed a threat to women's growth and development. It is necessary to establish a security solution that gives women a sense of security. Women are often stated to be immobilized in the aftermath of an assault. As a result, there is a need for a simpler safety solution that can be triggered as easily as pressing a button and can send warnings to the victim's immediate surroundings. This project focuses on a security infrastructure that is specifically designed to ensure the security and safety of women. The aim of this study is to develop a portable safety device for women that includes the Sends an emergency alert to family and friends. S. A. More's investigation [1] addresses the use of temperature and pulse rate sensors to automatically identify the possibility of an emergency and alert family and friends through a mobile app. [2] explores how to use image processing to identify any potential danger and offers a variety of options to defend her. The authors of [3] created a system that used a PIC16F876A microcontroller and a SIM808 module with GPS, GSM, and GPRS support to alert friends and family when the emergency button is pressed. A framework based on facial features is built in [4]. A report is filed if the facial www.rspsciencehub.com Volume 03 Issue 05S May 2021 International Research Journal on Advanced Science Hub (IRJASH) 90 expression is threatening in nature. GSM and GPS are used to build a secure system in [5]. The message is sent to pre-stored mobile numbers in this scheme, and it includes the victim's body position as well as her location. With the support of a synchronized Bluetooth link, [6] allows for independent activation of the android application and the arm computer. The audio and video that have been registered, as well as the location, are sent to the phone numbers that have been pre-set in the application in the form of a call and a message to warn them. An android app is developed in [7] that provides the location of the woman in danger through fake phone calls, video forwarding, location, and first-aid information. [8] uses sensors to detect body movements, heart rate, and body temperature with the aid of a reliable protection system that includes an ATMEGA8 controller with Arduino tool and

advanced sensors. [9][10] Employs three sensors: heartbeat, temperature, and accelerometer. These sensors are used to identify anomalies, and a message is sent to the loved ones using the GPS and GSM module. In the past system, the women's alerting system is implemented. The applications contain the SOS number for the purpose of security which warns the victims' family members. Many developers have creative applications that take this concern into consideration. Emergency service code that alerts police control is used to provide emergency services. The free "Help me mobile" mobile app has been launched to ensure the safety of women in an emergency. In order to do this, these applications require one click. But if a girl is in trouble, the girl may sometimes not be able to call and push the button [11][12].

In this twentieth-century where everyone is allowed to do whatever they want and to roam wherever they wish to go. There is a section or say half the section of the society who are still constrained to live their lives to the fullest. Yes, we are talking about females. Women are still suffering from various inequalities [13][14]. According to the National Crime Records Bureau, in 2015, there were over 300,000 reported incidents, a 44% increase from 2011 crimes against women[15][16]. They are the foundation of any economy essentially forming the eventual fate of the nation. She who earlier stayed at home to attend her domestic duties is now maintaining work and home simultaneously, participating in the process of economic development on an equal footing with men. So, it is the time to think about their safety and it is possible through IoT (Internet of Things)[17][18]. The main answer for the issue can be taken so that the women ought to be allocated with a well-being device that is convenient and guarantees her security[19][20]. Our task centers around giving a Smart contraption dependent on IoT arrangements that not just serve to female get away from the basic circumstances but also additionally guarantees to give equality to the women.

OBJECTIVE

- We aim to foster a sense of safety among women by harnessing the capabilities of technology.
- The wearable device sends an acknowledgement in the form of a text showing the location of the women and will provide the atmospheric temperature, so that the parents can have a track if the temperature does not suit the women.
- Women are the key to sustainable development and quality of life in the family. The varieties of role the women assume in the family are those of wife, leader, administrator, manager of family income and last but not the least important the mother.

II. PROPOSED SYSTEM BLOCK DIAGRAM

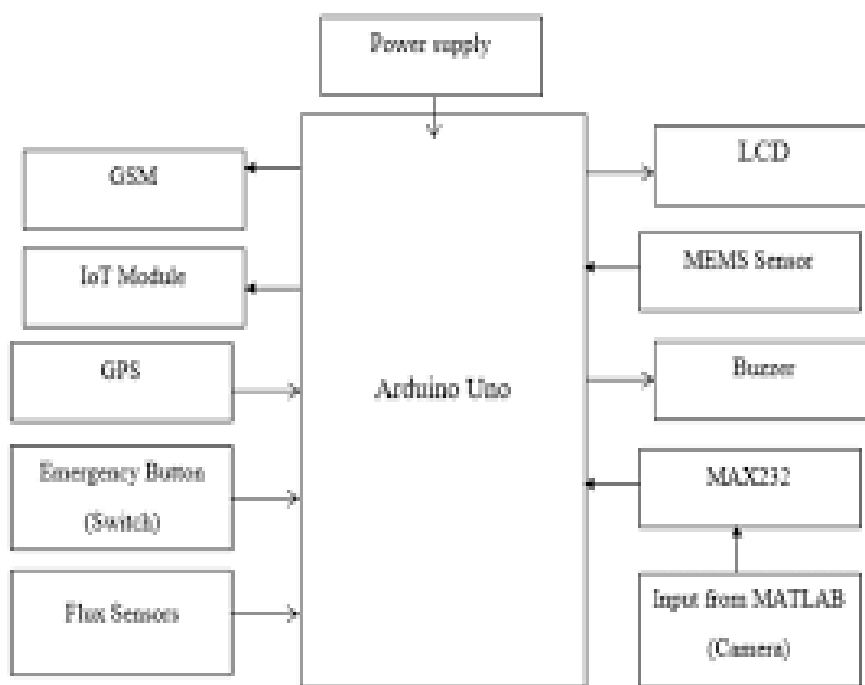


Figure.1 Block diagram for women safety.

The proposed system in the present project work is portrayed in Figure. 1 shown above in a highly remote manner with various blocks numbered which are explained as follows: Block 1 gives knowledge about Galvanic Skin Response Sensor. The galvanic skin response (GSR), also named Electrodermal Activity (EDA) and Skin Conductance (SC) is the measure of the unceasing variations in the electrical attributes of the skin, caused by the variation of the human body sweating.

Block 2 gives the knowledge about Vibration Sensor (SW420 module). Vibration Sensors are sensors for calculating, displaying, and studying linear velocity, displacement, and proximity, or acceleration. Therefore, vibration analysis is used as a tool to determine apparatus condition as well as the distinct location and type of complications.

Block 3 gives information about Pulse Rate Sensor (MAX30102). Pulse rate Sensor is a well-created plug-and-play heart-rate sensor for Arduino. This Sensor determines the pulse rate of the person.

Block 4 is the GPS unit. A GPS navigation system is a GPS receiver and audio/video (AV) peripheral constructed for a distinct goal such as a car-based or hand-held device or a smartphone app. The global positioning system (GPS) is a 24- satellite navigation tool that uses various satellite signals to find a receiver's spot-on earth.

Block 5 is the GSM unit. SIM800L module is a GSM-GPS two in one function module. In our system we are using it to send the location of the victim along with the message to the contacts which are registered.

Block 6 is the manual switch 1. This tactile switch is pressed manually by the user in case of any emergency.

Block 7 is the manual switch 2. This tactile switch is used by the user to instruct the beneficiary that the message which was sent previously was inaccurate and they have to just neglect the message

The microcontroller used is NodeMCU. NodeMCU is an open-source IoT platform. It consists of peripheral which runs on the ESP8266 Wi-Fi SoC from Espressif Systems and hardware which is based on the ESP-12 module. The word "NodeMCU" by default refers to the peripheral rather than the development kits.

III. WORKING

The complete working of the proposed system can be divided into different modules which are as follows:

- a) Database Module: - The user requires to provide the emergency contact numbers into the system which will be saved in the code. The code used will also save the messages which should be sent in different situations.
- b) Sensor Module: - The system separately applies the distress algorithm if the sensor module develops values greater than the threshold. As soon as the algorithm is applied system delivers the message along with the user location to the saved contacts. At the receiver just by ticking on the location link given in the message it can display the location on the Google map in terms of latitude and longitude.
- c) Global Positioning System (GPS) module: - It is navigation and accurate positioning tool. It records the location in the form of longitude and latitude.
- d) GSM System Module: - Global System for Mobile communication (GSM) SIM card is added inside the mobile device to deliver and obtain the messages using GPRS.

IV. Arduino

Arduino Uno is an electronics platform based mainly on the AVR microcontroller Atmega 328 developed by Arduino.cc. Arduino Uno's current version includes USB interface, six analogue input pins, 14 I/O digital ports used for connection to external electronic circuits. 6 pins may be used for PWM output out of 14 I/O ports. Figure.2 shows the Arduino UNO.

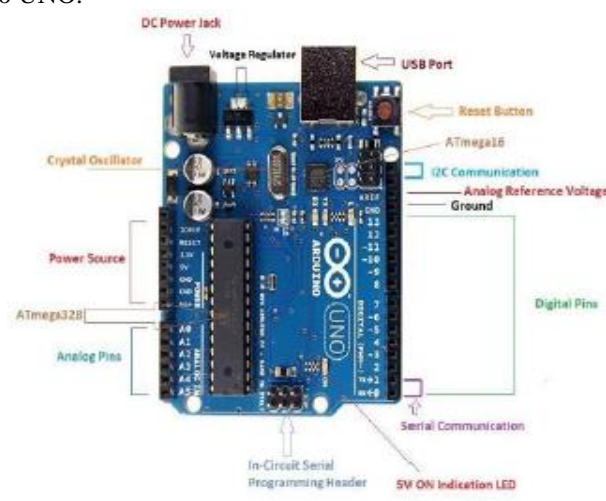


Figure.2. Arduino UNO.

V. Flowchart of the proposed system

The flowchart of the proposed system is shown in Figure.3. The flowchart starts with continuously taking the readings from the sensors. The three Sensors will measure the body vitals continuously. These readings will be processed through a set of conditions. If the conditions are met or the recorded values will be beyond the threshold value i.e. the normal ranges of the different sensors then the device will get triggered and the distress algorithm will get initiated. This will proceed with sending the location link in the form of latitude and longitude along with the appropriate message to the registered emergency contact numbers.

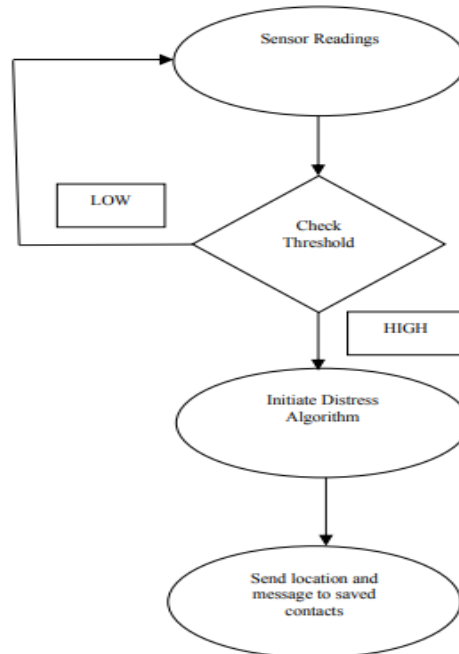


Figure.3 Flow Chart of the System

VI.RESULTS AND DISCUSSIONS

The components and modules used to construct the module are the three sensors for the automatic mechanism, namely pressure, temperature, and pulse rate sensors, are shown on the top of the device, along with the other hardware needed, such as GPS, GSM, buzzer, and Arduino, which are all present inside the model. When the victim is in danger and pushes the button then an alert message is sent to the mobile of the pre-set mobile numbers. As pressure and temperature sensors become HIGH, temperature and pulse-rate sensors become HIGH, or pulse-rate and pressure sensors become HIGH, the automatic mechanism is activated. GPS is used to track the location of the victim and to send messages, the location of the victim to the nearby police station and the phone numbers of the relatives of the victim.



Figure.4.Hardware implementation of SMS sending.

As shown in Figures 4 and 5, SMS alert, current location, and the captured image will send to concerned authorities. In our project we are using three ways for helping women first as automatically when temperature and heart rate exceeds above the threshold and second by pressing a button and also through voice. In all conditions, it sends alert to concerned authorities.

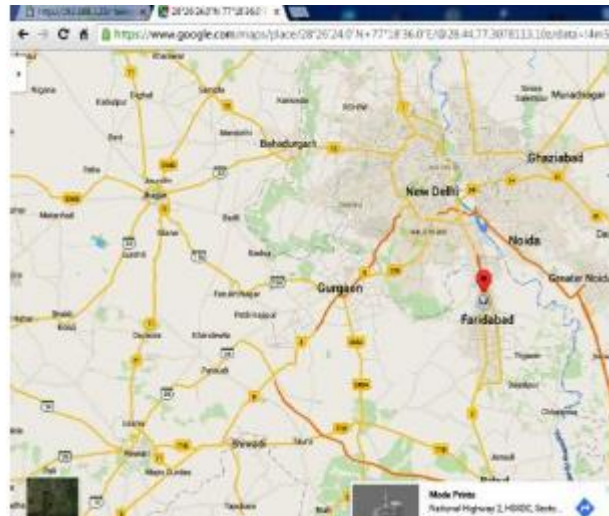


Figure.5. Location of the victim

VII. CONCLUSION

The main goal of creating a woman protection device is to act as a rescue and avoid any harm to women in the event of a hazard. A smart device for women's protection is planned using the proposed system, which automates the emergency warning system. This device detects and sends warnings to loved ones with the women's position coordinates without requiring her intervention in critical situations. It immediately sends an emergency alert to the family members and the nearest police station. The prototype can be carried in a variety of bags, including handbags and laptop bags. Carrying the prototype in these bags is recommended because the individual attempting to injure you might not be aware of your presence. With the world moving to the smarter lifestyle it has become an issue of prime importance to provide a secure system for women. The whole idea of this project is to provide a wearable safety device for women and at the same time can help in the regular health monitoring of an individual. The arrangements made to send the alert messages to the concerned authorities in case of an emergency proved to be working instantaneously with the different variations of inputs. The data of an individual is sent to the cloud for regular health updates. All the false alerts if triggered could be canceled with the help of the tactile switch and on the contrary, an emergency message could also be initiated in dangerous situations. The Internet of things has revolutionized the whole security system and this has resulted in a more compact and secure environment for the females.

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