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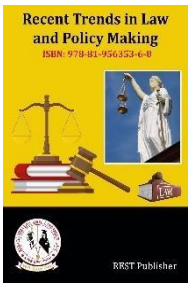

SOS Device for Women Safety

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Abstract: *Women security is need of the hour now-a-days. In India, there are many cases of women harassment and molestation. Safety of women matters let be whether at home, outdoor or it be their work place. The literature surveyed shows that there are many mobile applications that are used for women safety purpose. One recent research study shows that there is a footwear chip which is sticked to the footwear that gets activated when the person taps one leg behind the other 4 times. We focus on developing a prototype that is a smart sos device which gets activated by pressing the button either once or twice. The GPS location is sent to the ICE contacts as soon as the device is turned on. The victim's current location is sent to the ICE contacts. Double press activates device turning on, a Piezo buzzer siren will go out. The buzzer's volume ranges from 80 to 110 dB, and it may be heard 50 feet away. Until the device is turned off it will send the location on the interval of 5 mins and will keep on beeping continuously.*
Keywords: *GPS, PIEZO BUZZER*

1. INTRODUCTION

Existing handheld gadgets for women's protection need to be activated by a woman, such as by pressing a button or shaking the device, etc., once the woman has detected a threat. However, the goal of the safety device is not served if a woman does not have enough time to activate it while she is in danger. In a country like India where the growth rate of crime is considered to be more than the growth rate of population, which includes burglary, murders, rapes, and many more women's safety is believed to be one of the most important issues. India is rated as one of the most dangerous countries in the world for women by the Thomson Reuters Foundation, and it also has the most child brides. In 2016, the number of reported rapes is almost 39,000. Experts that were interviewed for the reason why India is presumed to be dangerous for women said India is on top of the list because its government has done almost nothing to provide safety to women since the rape and murder of a student in early 20's in 2012 which prompted changes in the rape laws of the country. Most of the attacks on women happen when they are traveling alone or are in a remote area where they are not able to find any help or proper assistance. In order to address the issue of women's safety and to address the flaws of current technologies, this study suggests an IoT-based solution. The suggested design includes elements to alert relatives and the local police station for prompt assistance when women are not safe. In this study by D. G. Monishaet al.[20], turning on the device only requires pushing the emergency button once. When engaged, this device uses a GSM module to broadcast a distress signal and an instant location to pre-programmed police numbers3. Double clicking the emergency button causes the device to send a distress message with a location and capture the audio of the occurrence. The same button activates a call to the police and sends a message with the police's immediate location when it is pressed for a long time. We can also connect the device with our mobile (through Bluetooth HC05), to find our location even if our mobile is lost which can be activated by clicking tracking your mobile button5 and the location of the mobile is sent to the pre-set number. S. Ahiret al.[19], focus on developing a prototype that is a smart device that can be worn by any individual on their wrists. The band is always active; the victim needs to tap on the screen twice when she feels the need of it, or she feels someone is abusing her. After tapping on the screen, the device will start sending the current latitudinal and longitudinal coordinates to the ICE contacts and the police control room. After one minute of actual use, the device's piezo buzzer starts to generate a beeping sound. The range of the buzzer covers up to

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50 meters of radius. If the suspect tries to remove the band and throw it, the force sensors will start working and buzzer will start ringing and the location at that particular time will be sent. On the top of the band there are two nodes which will emit electric current as soon as it comes in contact with any surface after the device is activated. The current is generated with the help of leakage current. The device and the smart phone are connected using Bluetooth, which is responsible for overall data sharing and connectivity. The heart of the device is Arduino which controls the entire device prototype. OLED screen is used as the UI for the device. A captative touch is used for carrying out the touch functionality of the screen. It is attached to the OLED screen. Wasim Akram et al.[23],designs a device to prevent false alarms from being raised and to guarantee that alerts are only made in emergency situations, the fingerprint is utilized as the user's unique identity. A buzzer is incorporated into the design to guarantee total security, alerting everyone around to the incident. Text messaging makes sure that the victim's immediate family and the police are informed of their current whereabouts. Women who feel the need for self-defense can utilize a shockwave generator to temporarily disable the offender. In addition to the hardware-based design, a mobile application for Android has been created to offer further security functions including sending group messages, capturing audio, and pinpointing nearby safe locations on a map. Trisha Sen et al.[23], describes GSM enables real-time SMS delivery to mobile devices as well as telephony capabilities. The Arduino uno is connected to a GPS to display the precise latitude and longitude coordinates of the user's position. The buzzer, camera, and nerve stimulator are all connected to this and will turn on when the switch is touched. SMS and calls can be initiated using voice command using an Android app. The final use of IoT technology in this context is to upload all of the microcontroller's current status data to a server for storage and worldwide user access. The GSM module, which has an associated speaker and microphone, enables two-way conversation using the pre-set numbers, allowing the user to discuss the matter with the caller on the other end. Nandita Viswanath et al. [21], designs a device where the user does not need to have physical access to this affordable technology to her smartphone, which is securely tucked away. To start, the user does not have to carry anything or touch any buttons on whatever was in her hands. User only needs to tap her left foot. Using her right foot, she will step back from the target and release a trigger. Her smartphone, which will notify five predetermined numbers through SMS of the device's position. The device's size and shape make integration simple. Existing device has many advantages but at the same time it has disadvantages too. The battery consumption will be very high, hence it will be more effective if there is a battery backup option. These were novel ideas that were not frequently recognised. However, the main drawback is expense, and incorporating all of the ideas within one system will strain finances and make the system too large to be used as a portal device.

2. MATERIALS AND METHODS HARDWARE

COMPONENTS:

1. ***ARDUINO UNO:*** Arduino is a tool for building computers that are more physically aware and capable than a desktop computer. It is a physical computing platform that is open-source and based on a straightforward microcontroller board, together with a development environment for creating applications for the board. We will employ an Arduino Uno in our project. The Arduino Uno is a microcontroller board with an ATmega328 processor. It contains 6 analogue inputs, a 16 MHz ceramic resonator, a USB port, a power jack, an ICSP header, and a reset button. It also has 14 digital input/output pins, six of which can be used as PWM outputs. Simply use a USB cable to connect to a computer or an AC-to-DC power adapter to power it; it comes with everything needed to support the microcontroller.

FIGURE 1. Arduino UNO

2. *GSM /GPRS MODULE:*

FIGURE 2. GSM /GPRS module

GSM module: A computer and a GSM-GPRS system can communicate thanks to the GSM/GPRS module. Most nations employ the Global System for Mobile Communication (GSM) architecture for mobile communication. Higher data transfer rates are made possible via the GSM addition known as Global Packet Radio Service (GPRS). A GSM/GPRS modem is assembled with a power supply circuit and computer connection interfaces (such as RS-232, USB, etc.) to make up a GSM/GPRS module. A group of wireless MODEM devices known as GSM/GPRS MODEMs are created specifically for connecting computers to GSM and GPRS networks. Similar to mobile phones, it needs a SIM (Subscriber Identity Module) card to start communicating with the network. Additionally, they can be identified by an IMEI (International Mobile Equipment Identity) number, just like mobile phones. A GSM/GPRS MODEM is capable of carrying out the following tasks: 1. Use a SIM to receive, send, or delete SMS messages. 2. Review, edit, and search the SIM's phonebook entries. 3. Place a voice call, accept it, or decline it. GPRS module: The Global Positioning System (GPS) is a radio navigation system that determines precise and accurate location, velocity, and time regardless of weather conditions. Additionally, GPS works on land, air, and sea. Your devices or circuits can get GPS data with the help of GPS modules. However, you can use microcontrollers as substitutes with a simple piece of code if GPS modules are not readily available. he ability to communicate your location or find out where another object or person is located is now a regular feature on phones, laptops, and other intelligent gadgets. Additionally, GPS offers navigation systems and access to real-time maps.

3. MICROPHONE MODULE:

FIGURE 3. Microphone module

Condenser microphone audio signals can be boosted to be used as cylinder microphone inputs. Amplifier module will amplify the audio signal input from the audio input port and directly amplify the pickup signal of the onboard microphone. Output of the board can be directly connected to the audio input terminal of the stereo or the audio input terminal of the computer to realize voice chat or voice amplification. The operational amplifier core on the amplifier board, which enables adjustable amplification gain, is accurate and of the highest quality. With very little background noise, the sound is clear and bright, also such amplifier module keeps simple installation.

4. BUZZER MODULE:

FIGURE 4. Buzzer module

As a sort of electronic signal with coordinated structure, ringers, which are provided by DC power, are broadly utilized in PCs, printers, scanners, cautions, electronic toys, car electronic gadgets, phones, clocks

and other electronic items for voice gadgets. Turn the pins of two signals face up, and the one with a green circuit board is a uninvolved ringer, while the other encased with a dark tape is a functioning one.

5. ***MINI SWITCH the MINI SWITCH*** is a panel that is incredibly compact and lightweight and can be used anywhere along with a large selection of diffusion accessories, it includes AC and DC power solutions which all fit neatly into one bag.

FIGURE 5. Mini Switch

6. ***ARDUINO UNO:***

The main centre of our model is Arduino. It is known as open-source micro controller gadgets considering easy to work hardware further more programming. Arduino include both actual microcontroller and IDE which continues to run in your system. The stage of Arduino ended up bring very notable with people basically starting with contraptions and justifiable.

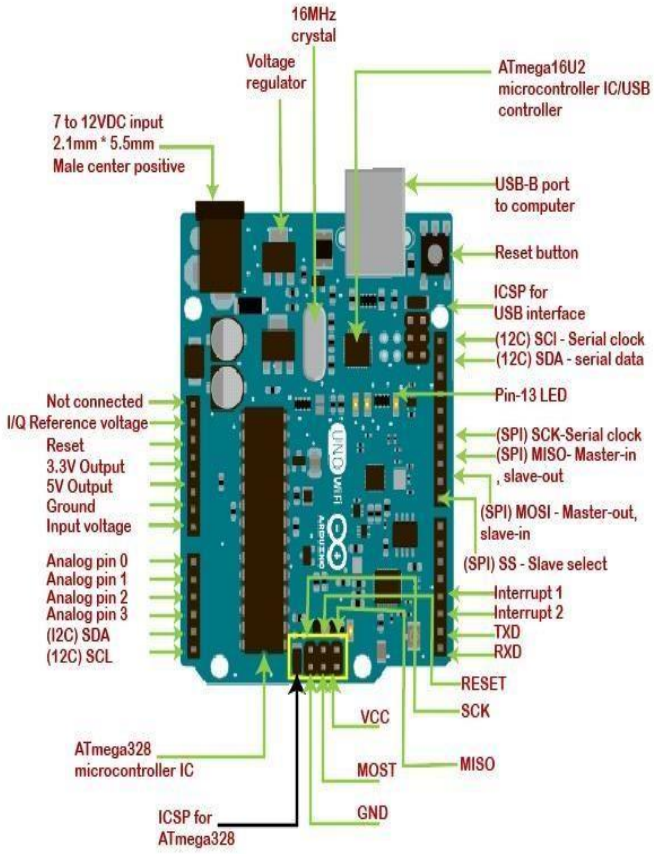

FIGURE 5. Arduino pinout diagram

A necessary component of the structure is an open-source microcontroller gadget with easily accessible programming/equipment stage that is all around coordinated with numerous sensors available. Everything needed for it to work is on the board; all we need is a USB link to connect it to a PC or provide power via a battery source or an AC to DC connector to get started. Similarly, it is not expensive and can be estimated using free creating software such as IDE (incorporated improvement climate). With the availability of a large number of source codes on the internet, Arduino programming becomes more fluid. The Arduino community

on the internet is made up of software engineers like us who share their designs for others to use. The growing internet community that supports Arduino includes software engineers like us who section their models for others to make it a more trustworthy platform. It is primarily used in RF and IR circuits. These mediators are primarily used for controller applications such as interloper alert, vehicle entryway caution, security framework, and so on. The encoder and decoder pairs chosen for correspondence should have the same number of address and information bits.

3. BLOCK DIAGRAM

These modules support the defense of women in perilous situations. Arduino and power supply unit used as a control unit.

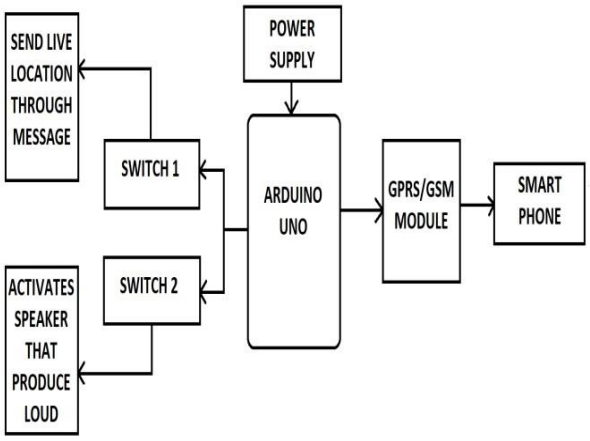

FIGURE 6. Input/output connections to Arduino

GSM, GPS and Buzzer are used as Transmission unit.

- When a woman is in a panic, she can hit the emergency key that is built into the system.
- By just hitting an emergency key, the registered number will receive the message "IN DANGER."
- Women can use the buzzer to warn passersby and request assistance.
- Woman will press a second button that is built inside a self-defense board. The location will be tracked using GPS after pressing this button.
- GSM sends location information in the form of longitude and latitude values to the registered number.
- Registered numbers may be the phone number for the police, a relative, a friend, or a member of the family.
- The goal of this paper is to end the harassment that women experience.
- The benefits include portability, ease of maintenance, quick response times, and environmental friendliness.
- The drawbacks include Network difficulties.

4. RESULTS AND DISCUSSIONS

This model serves as an alerting device as well as for self-defense. In this Project, we use GSM which is capable of sending SMS to the mobile in real time and also for calling purposes.

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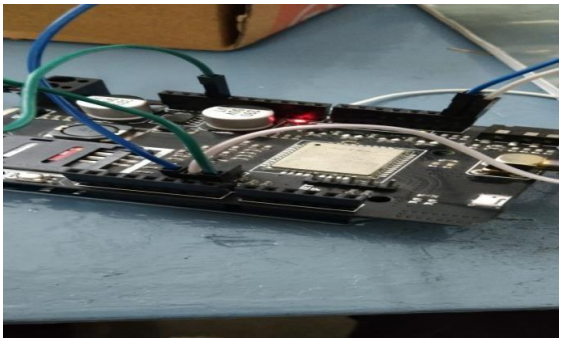

FIGURE 7. Hardware setup of the women safety device GPS is connected to the Arduino UNO to show the exact latitude and longitude coordinates of the user location. A switch is connected here to activate the buzzer.

5. CONCLUSION

Women's safety is a concerning problem in contemporary society. Women are more susceptible to threats, mocking, and harassment when travelling in isolated regions. They feel helpless as a result. The design and hardware implementation of a straightforward and reasonably priced women's safety device using the Arduino IDE, GSM, and GPS modules is suggested in this paper. A push button on this safety device must be pressed by a woman in the event that she detects any risk. In this situation, GPS locates the women fast, and a GSM module sends an emergency message to contacts who have been saved, as well as to a nearby police control room. Additionally, the buzzer to signal passers-by to assist the women. As a result, comprehensive protection for women is guaranteed

6. FUTURE SCOPE

This prototype can be improved upon to become a wearable gadget. To make the design more user-friendly and easily transportable, it can be made lighter and more compact. The device can be improved with the help of the Android application. Depending on the needs of the user, it may allow numerous contact details to be entered. Furthermore, the application enables access to recorded evidence.

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