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E-DEFENSE WOMEN SAFETY SYSTEM

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Abstract: With increasing cases of crimes against women it has become the need of this hour for women to protect themselves. According to statistics, there were over 28,000 rape cases reported in India in the year 2020 alone. This project work proposes a solution in helping women find support and defend themselves from any threat using a wearable wristband. Using this device in crisis cases, women can taze the aggressor using a non-lethal taser so that she can distract the aggressor and sneak off to a safer location. The device also enables women to send a message with GPS location along with a captured image of the aggressor to their emergency contacts, which helps track the woman in need of support. It also includes a buzzer that can be used to alert people around them of their situation. The device includes a pulse sensor and temperature sensor which records the current temperature and pulse rate of the individual.

Keywords: electric shock, face recognition, GPS, GSM, IoT based device, women safety device

I. INTRODUCTION

India came in first place on a list of dangerous nations for women in a 2019 survey. This is not shocking considering that year alone had over 400,000 reported crimes against women. The security of women has not improved despite the implementation of stringent laws and government awareness campaigns. An attacker may possess the physical skills necessary to readily target and assault a victim in a time of stress. Women might not be able to physically protect themselves in such a situation. With the help of this device, a woman in a dangerous position will be able to send crisis alerts to specific individuals, let them know where you are if something goes wrong, and defend herself with the built-in taser and also capture image of the attacker that can be used in case of trail.

[1] There are several women's safety devices available nowadays, such as a running-related device that automatically reads and develops patterns of body temperature and heart rate. A message or call is immediately sent to many SOS contacts along with the location if readings are found to be greater than normal. Additionally, it makes advantage of the ZigBee mesh network to solve the internet connectivity issue. [2] A system that sends SMS and location using GSM and GPS, to trusted contacts and police to make them aware of women in danger. The system can be activated by pressing a switch button, which immediately sends the SMS and location. [3] An automated wearable smart device is proposed to prevent various crimes against women. Biosensors are used to detect any of the user's bodily changes and alert any abnormality that is found. GSM and GPS are used to send location. The victim's position is communicated to the pre-registered mobile numbers and the local police station. While the victim's surrounds are alerted by the buzzer [4] An emotional analysis to assess the safety of a city for women. It mostly discussed how a woman might learn about a city's level of security through social media, but it did not address how a woman can defend herself in the event of danger. As a result, we devised a system that prioritizes the woman's safety before considering the safety of her surroundings. [5] When the SOS button is pressed, the authors of this research designed a system that transmits alert signals to emergency contacts. As a result of this activity, the Raspberry Pi camera and the buzzer are both activated, and the image is then uploaded to the cloud. Despite the fact that this strategy considers a woman's protection, it overlooks the urgent steps that she can take in a crisis. As a result, to address the issue, we integrated an electric stun. [6] Deep sensing was utilized by the author to assess the facial expression of the person in front of him and inform the user if there was suspicion. We have eliminated the use of facial movements and sensors in our system. In this approach, the cost of the system can be decreased, and superfluous system triggering can be avoided. A shock generator was also employed. [7] A fingerprint activated system that uses a high voltage current producing circuit. The system will be utilised to convey signals to emergency contacts and temporarily stun the opponents. Only the victim's location was included in this system's SMS. [8] A system that allows users to use three push buttons to send alert messages to the neighbourhood police station and emergency contacts. The difference in time between when the crime really occurred and when it was reported to the ascendancy can be blamed as the cause.[9] A wristband and mobile combination that combines temperature and pulse sensors with the ability to send alert messages to the neighbourhood police station and emergency contacts. This essay suggests a different approach to using advancement for the security of women. [10] An embedded system that can assist women in sending emergency signals, smearing noxious gas, stunning, and livestreaming the dangerous circumstance. The layout and application of wristbands are discussed as examples in this study. All the above-mentioned systems have certain disadvantages that have been overcome in our system

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II. PROPOSED SYSTEM

The Self Defence Watch for Women's Safety is a prototype that assists women in defending themselves in perilous situations. In an emergency, the sufferer can utilize the watch to contact her emergency contact. Meanwhile, the watch uses GPS to track the victim's location, and it may also stun the assailant with an electric shock, allowing the victim to flee or hide. It can also trigger an alarm to alert other people in the area. Self-defense is now easier than it is presently. Our proposed solution also includes an inside camera that may be used to capture the attacker's image for legal purposes.

Proposed system architecture:

The proposed system has the below mentioned features:

- A notification about the threat can be sent to the emergency contacts whose numbers have been preloaded by hitting a button.
- GSM or Twillio Messenger sends the message to these contacts, and GSM or Twillio Messenger tracks the user's location.
- With the use of a miniature camera in the gadget, the user can also capture and send the image of the aggressor to the emergency contact along with the message.
- It can also stun the attacker by putting the shock-generating device into touch with the attack, and it can use the buzzer to alert passers-by.

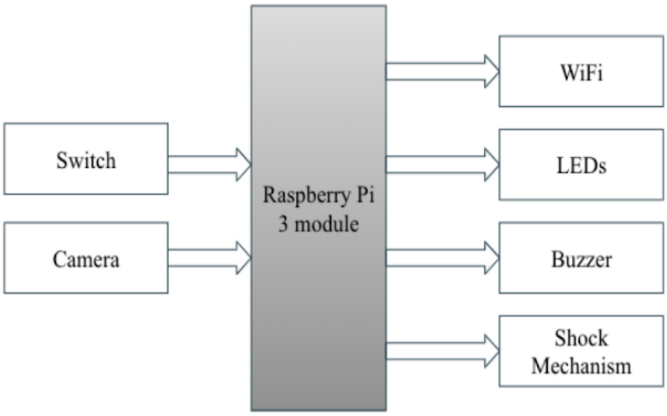

Fig. 2.1. Block Diagram of the proposed system architecture

III. IMPLEMENTATION

A. RASPBERRY PI WEB CAM INTERFACE FOR PHOTO CAPTURE AND SENDING MAIL

The Raspberry Pi Camera Web Interface provides a web interface for the camera module on the Raspberry Pi. Surveillance, dvr recording, and time lapse photography are just a few of the tasks it can handle. It's highly customizable, and macro scripts can be used to extend it. It may be accessed using any browser (including cell phones) and has the following features:

- View, pause, and resume a low-latency, high-frame-rate live preview. The entire sensor area is available.
- Control camera settings such as brightness, contrast, and more in real-time.
- While the live preview continues, record full-HD films and store them on an SD card in an mp4 container.
- Make a timed or continuous video recording with parts of fixed length.
- Take a single or more full-resolution (timelapse) photos and store them on the SD card (live-preview holds on for a short moment)
- Preview, download, and delete the films and photos you've saved, and zip-download numerous files.
- Motion detection, either internal or external, can be used to trigger captures.
- Many scheduling alternatives capture the trigger.
- Actions leading up to motion detection are captured in a circular buffer.

We utilised BotFather in this project to send photos to the emergency telegram contacts. BotFather is the master of all bots. It will assist you in the creation of new bots as well as the modification of existing ones' parameters. We also use HAAR Cascade algorithm to detect the face of the attacker.

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Fig. 3.1. Raspberry Pi interface with Pi Camera

B. RASPBERRY PI SHOCK GENERATOR INTERFACE WITH RELAY

To use the Raspberry Pi to control modules with a greater voltage. On the Raspberry Pi, relays can be used for this: A low-voltage pulse is used to activate the relay "switch." Without relays, the Pi can only tolerate a maximum of 5V (the GPIOs only 3.3V). This poses a risk of Pi burning out. If you have two independent circuits, however, this will not happen. A relay is used in this project to drive a shock generator.

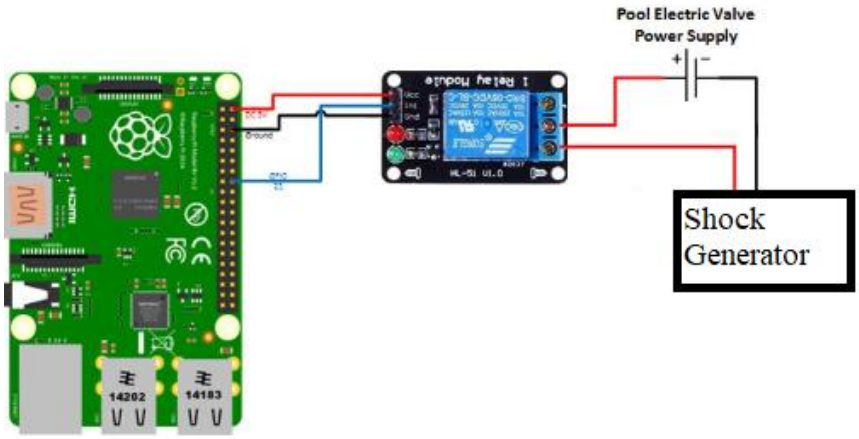

Fig. 3.2. Raspberry Pi interface with shock generator

C. RASPBERRY PI INTERFACE WITH ALARM

A buzzer or beeper is a mechanical, electromechanical, or piezoelectric audio signalling device (piezo for short). Alarm clocks, timers, and confirmation of human input such as a mouse click or keyboard are all common uses for buzzers and beepers.

There are two wires, red and black.

- To generate a noise, use an oscillating voltage with the polarity black=ground.
- The piezo element is supported by the buzzer housing, which also features a resonant cavity for sound.

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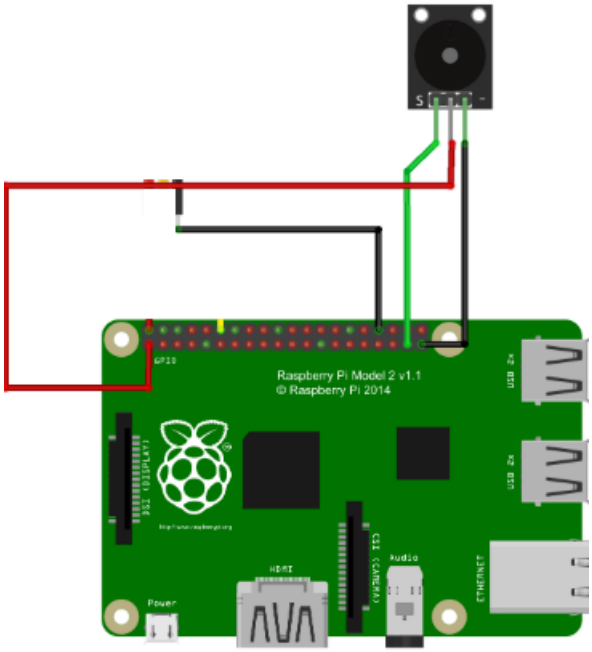

Fig. 3.3. Raspberry Pi interface with buzzer

A buzzer is utilized in this project to indicate when an emergency has been detected.

D. INTIMATION MODULE TWILIO

You may send outbound SMS messages from your Twilio phone number to mobile phones all over the world using Twilio's REST API.

When an emergency is discovered in this project, an alert will be issued to the affected person via the Twilio API.

IV. RESULTS AND DISCUSSION

The project allows for the creation of a compacted kit and concept that will aid in the scientific clarification of women who are now facing a variety of difficult conditions. Using a wristband, a process similar to tear gas emission is used to broadcast messages to the location. The above-mentioned invention has the potential to alleviate the agony of every woman around the globe who is concerned about her safety and security.

A woman can send a message to her emergency contacts with just a click of a button using this project. She can also send an image of the perpetrator to her emergency contact through telegram. She can use the buzzer to alert people in a local range, as well as stun the attacker, giving her ample time to flee. With only one click, you'll have all you need.

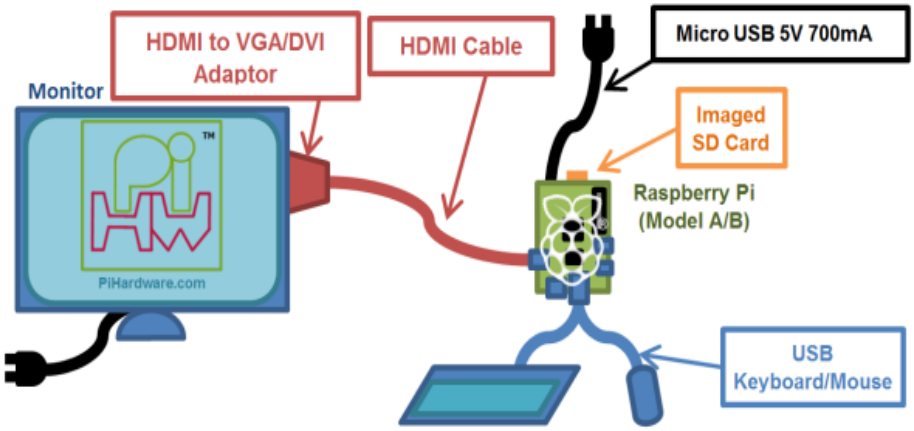

Fig. 4.1. Project Setup

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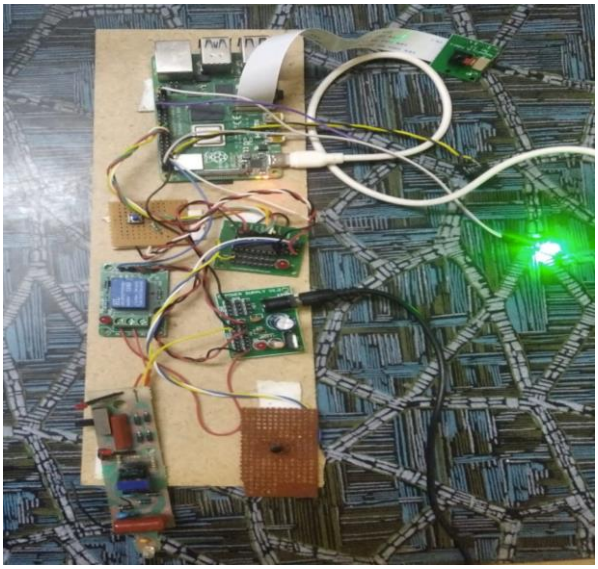

Fig. 4.2. Prototype of E-defence Woman Safety System

The device's sample message outputs are shown below:

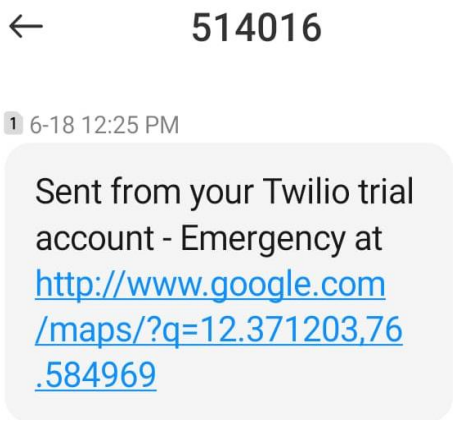

Fig. 4.3. Help message with location sent to emergency contacts

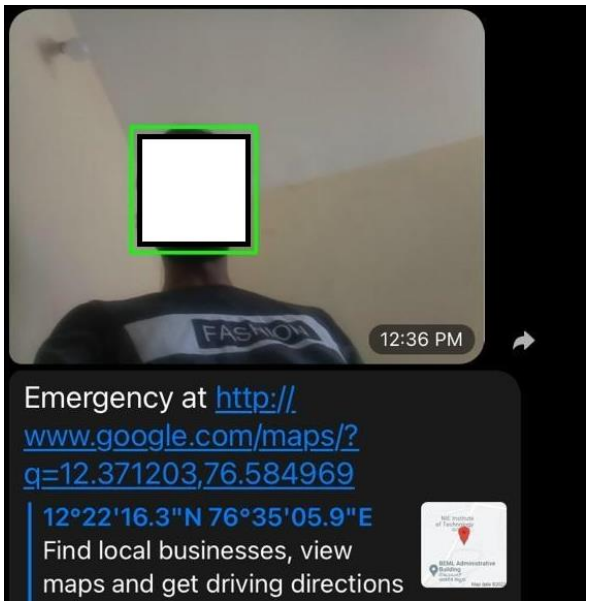

Fig. 4.4. Help message with location and attacker image sent to the telegram account of user's emergency contacts.

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V. CONCLUSION

The objective of this undertaking is to guarantee each woman in our general populace to incline that everything is great with the world and guaranteed. Wristband is a super fancy guard for girls at anytime and anywhere when they wear. So that girls can come out freely without any obstacles to reach their goals and future endeavors. During times of emergency or panic, this wristband can be used to send aid messages with the current location to the person's emergency contact. When the attacker is within close range of the woman, she can use the electric stun to trigger the aggressor's response action, allowing her to flee. The band also has a camera that takes an image of the assailant and sends it to the user's emergency contact's telegram account, which may be used as proof in the event of a trail, as well as a buzzer that can be used to notify those close to the incident.

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