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Women Safety Device with GPS Tracking and SMS Alerts

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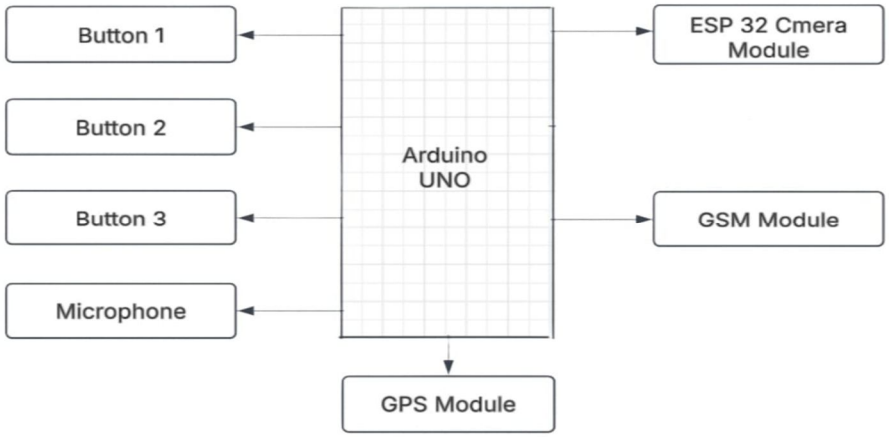
***Abstract:** This paper presents the design and implementation of an women's safety device with GPS tracking and SMS alerts. The main purpose of this project is to introduce the concept of a women's safety device for application in India. The main purpose of this device is to act as an emergency device for women who are in potential danger of being attacked. The woman possessing this device will press the panic button if in danger. An SMS containing the latitude and longitude coordinates will be sent to preferred mobile numbers informing them of the danger and the location. The received coordinates can be viewed on goggle maps to determine the location of the woman and appropriate help can be provided. This concept was devised in the wake of serious crime against women in India and to help curb those crimes.*

I. INTRODUCTION

Women's safety device is a security device specially designed for woman in emergency and in distress. This device consists of a system that ensures dual alerts in case a woman is harassed or she thinks she is 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. The main purpose of this device is to intimate the parents about the current location of the women. A GPS system is used to trace the current position of the victim and a GSM modem is used to send the message to the pre-defined numbers.

A. Block Diagram



II. LITERATURE SURVEY

Security is most important factor for safety of women. Today's women require help for their safety so there is need for developing a portable system for women security.

1) Women Safety Device and Application-FEMME: In our Country, even though it has super power and an economic development, but still there are many crimes against women. The atrocities against the women can be brought to and development, but still there are many crimes against women. The atrocities against the women can be brought to an end with the help of our product "FEMME". This device is a security system, specially designed for women in distress.

2) Design and Development of "Suraksha"-A Women Safety Device: India which sees itself as a promising super power and an economic hub, is still trapped in the clutches of various patriarchal evils like molestations, dowry, crime against women, worst among all is Rape. The atrocities against the women can be now brought to an end with the help of a device called suraksha. This paper explains the basic idea underlying suraksha which is to flash a warning giving an instant location of the distressed victim to the police so that the incident could be prevented and the culprit apprehended. This would help reduce crime against women. This paper also summaries other significant works in this field and hence forth discussed suraksha device in a greater detail.

3) Design and Implementation of Women Safety System Based on Iot Technology: We propose to have a device which is the integration of multiple devices, hardware comprises of wearable "Smart band" that endlessly communicates with sensible phone that has access to the web. This paper covers descriptive details about the design and implementation of "Smart band". The device consists of a trigger, microcontroller (ATmega2560), GSM module (SIM900), GPS module (Neo-6M), IoT module (ESP- 12E), Neuro Stimulator, Buzzer and Vibrating Sensor. In this project, when a woman senses danger she has to hold ON the trigger of the device. Once the device is activated, it tracks the current location using GPS(Global Positioning System) and sends emergency message using GSM(Global System for Mobile communication) to the registered mobile number and nearby police station. IoT module is used to track the location continuously and update into the webpage.

4) GPS and GSM Based Self Defense System for Women Safety: The world is becoming unsafe for women in all aspects. The crimes against women are increasing at a higher rate. The employed women are feeling unsafe due to increasing crimes. This paper proposes a quick responding mechanism that helps women during trouble. When someone is going to harass, she can press the button that is attached to the device and the location information is sent as an SMS alert to few pre-defined emergency numbers in terms of latitude and longitude.

III. PROBLEM STATEMENT

At any emergency situation women get panicked in that situation they may not be able to operate their smartphone application, and cannot be immediately defend the tracker and protect themselves.

In this Device there are three operations which will be performed:

1) Sending text message which contains the location.

2) Capture the image and stores it in memory card.

IV. PROPOSED METHODOLOGY

The proposed system operates as follows:

1) System Overview: A wearable safety device with a panic button, GPS tracking, and SMS alert system to send distress signals with location information to emergency contacts.

2) Key Components: Microcontroller (e.g., Arduino, ESP32)
GPS Module (e.g., NEO-6M)
GSM Module (e.g., SIM900)
Panic Button
Rechargeable Battery

3) User Initialization: The user sets up emergency contacts, either via a mobile app or direct device configuration, to store contact details.

4) Device Operation: In idle mode, the device tracks location.
In panic mode, it sends SMS alerts with the user's GPS coordinates to emergency contacts.

5) Real-Time Location Sharing: Sends Google Maps link with GPS coordinates for accurate tracking by emergency contacts.

6) Battery and Alerts: Includes a low-power mode and low battery indicator, ensuring continuous operation and alert feedback to the user.

7) Testing & Deployment: Field test the device for accuracy and reliability, then distribute for use, with future enhancements like app integration and direct law enforcement alerts.

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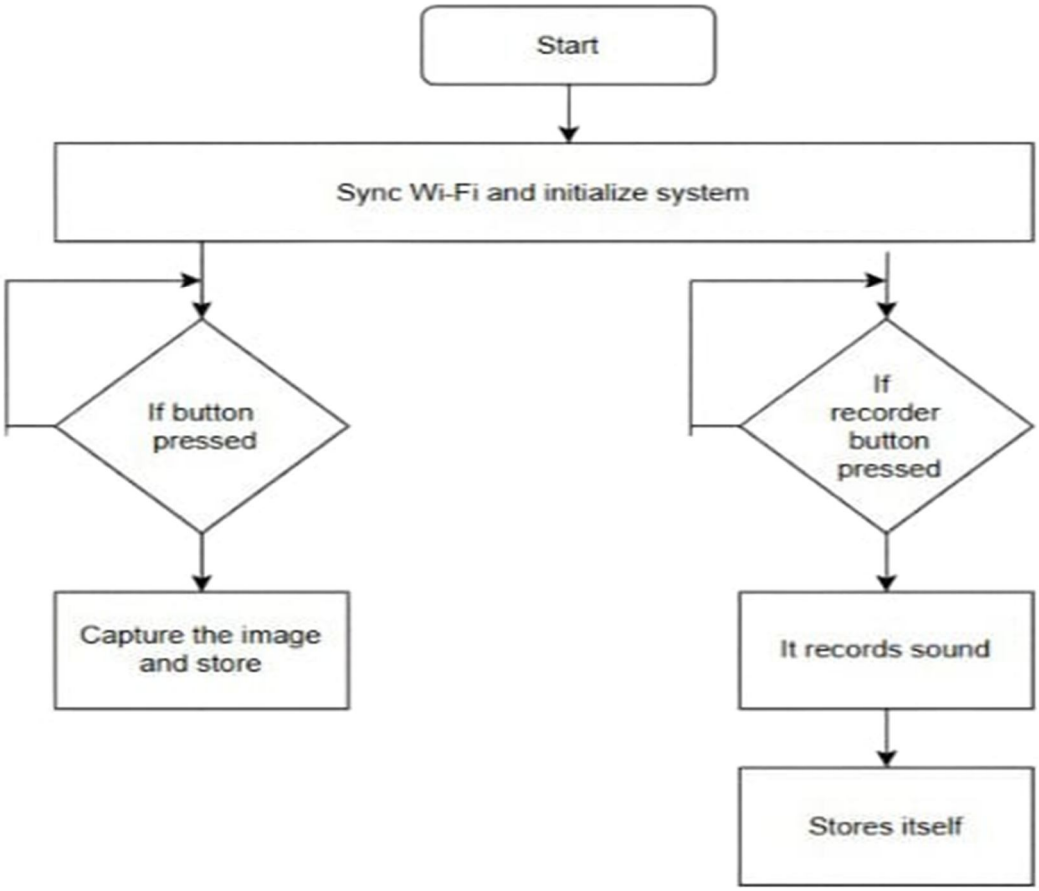
V. SYSTEM OPERATION

1) Initialization: The user sets up emergency contacts through a mobile app or directly on the device.
2) Idle Mode: The device tracks the user's location via GPS but doesn't send alerts unless activated.
3) Panic Mode Activation: In an emergency, the user presses the panic button, and the device retrieves the current GPS location.
4) SMS Alert Transmission: The device sends an SMS with the distress message and GPS coordinates to emergency contacts.
5) Real-Time Tracking Updates: If the user is in distress for a while, periodic location updates are sent to contacts.
6) Alert Confirmation: The device confirms the successful sending of the SMS to the user with a visual or audible indicator.
7) Battery Management: A low battery alert notifies the user when charging is needed, and the device enters power-saving mode when idle.
8) System Shutdown: User can manually turn off the device or it enters low-power mode after inactivity.
9) Post-Emergency: The device confirms the alert, sends follow-up updates, and can contact authorities if needed.

Flow Chart



VI. COMPONENTS USED

1) Arduino UNO
2) ESP32 Camera Module
3) GSM module: SIM800L
4) GPS Module: NEO-6M GPS
5) Speaker
6) Battery
7) Switches: PLAY L, PLAY E, REC

VII. FUTURE SCOPE

The purpose of this device is to act as an emergency device using this devices SMS will be send and image will be captured using IOT captured image will be send for further investigation. The calling mode could also be inserted.

VIII. CONCLUSION

The proposed system will help the girl when she is in danger zone. She can make rescue herself in danger situation and this circuit will use to remove or decrease the tension of woman when she walks alone in night also, never feel helpless at any situation and can protect her. If an emergency occurs then the device is useful.

IX. ACKNOWLEDGEMENT

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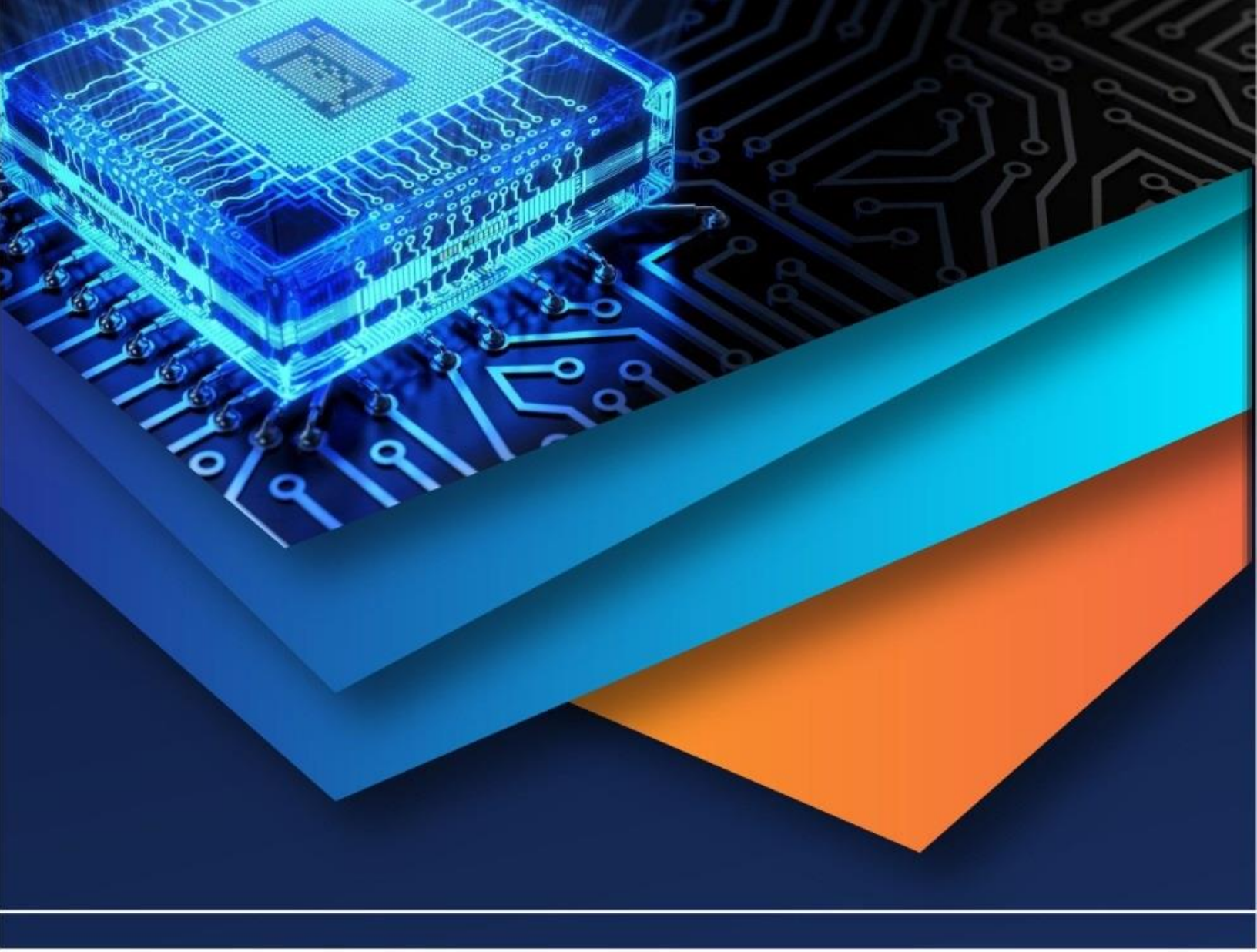

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