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Self Defence Smart Device

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Abstract: - The "Self-Defence and Smart Device" for Women Safety project addresses the growing concerns over women's safety by providing a dual-purpose wearable solution that combines both self-defence and real-time alert capabilities. The device incorporates a self-defence mechanism in the form of an electric shock system, designed to help women deter attackers in critical situations by delivering a mild electric shock. This physical deterrent provides immediate protection, giving the user time to escape or seek further help. Additionally, the device features a smart alert system powered by a microcontroller. When activated, the device sends an SMS alert containing the user's GPS coordinates via a GSM modem to pre-designated contacts or emergency services. This ensures that the user's location is accurately shared, enabling rapid response from authorities or trusted individuals, even when the user cannot verbally communicate. By integrating these two key features- self-defence and real-time location alerts, the project provides a comprehensive and cost-effective solution for enhancing women's safety. This wearable device offers both immediate physical protection and a reliable means of summoning help, empowering women to navigate their daily lives with greater confidence and security.

Keywords: Smart Device, Women Safety, real-time location alerts, violence, wearable device.

I. INTRODUCTION

In today's world, the safety of women is a growing concern as the frequency of harassment, assault, and physical abuse continues to rise. Women face the constant risk of violence in public spaces, workplaces, and even in their own homes, creating an urgent need for effective solutions to enhance personal safety. The "Self-Defence and Smart Device" for Women Safety project aims to address this issue by offering a dual-purpose wearable device that provides both immediate physical protection and a fast, reliable alert system. This project integrates cutting-edge technology with a self-defence mechanism, empowering women to defend themselves and seek help when needed. The first key component of the device is the self-defence mechanism, which incorporates an electric shock system. This feature is designed to help women protect themselves in critical situations by delivering a mild but effective electric shock to an attacker. The shock mechanism acts as an immediate deterrent, allowing the user to incapacitate the assailant temporarily and create an opportunity to escape or call for help. This functionality is discreet and easy to activate, making it highly effective in moments of physical threat when quick action is necessary. The second component is the smart device functionality, which leverages a microcontroller to send real-time SMS alerts to authorities or pre-designated emergency contacts. When the user activates the device, it immediately gathers the GPS coordinates of the user's location. This location data is then transmitted via SMS message using a built-in GSM modem. The microcontroller ensures that the message includes accurate latitude and longitude information, enabling responders to locate the individual quickly and efficiently. This system ensures that even in situations where the user cannot verbally call for help, their location is shared with those who can provide immediate assistance. Together, the self-defence shock mechanism and the smart alert system create a comprehensive solution for women's safety. This cost-effective, wearable device provides a dual-layer approach to protection: it allows women to physically defend themselves in emergencies while also ensuring that help is on the way. The combination of these features is designed to give women greater confidence and independence, knowing they have a reliable tool for both defence and communication in times of distress. By incorporating self-defence and smart technology into a single device, this project aims to reduce response times in emergencies and empower women to navigate the world with a greater sense of security.

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II. EXISTING SYSTEM

In safety watch based on the Internet of Things [1], the safety watch utilizes IoT technology to offer features like emergency alerts and location tracking, ensuring enhanced security for users. In paper [2], IoT-based unified approach for women's safety alert using GSM enables real-time tracking and emergency notifications, ensuring swift assistance by leveraging GSM networks for communications. Safety Assistant and Harassment Prevention for Women [3] provides real-time monitoring, alerts, and preventive measures to ensure women's safety in public and private spaces. IoT Wearable sensors and devices in elderly care [4], enable continuous health monitoring, real-time alerts, and enhanced care management, promoting safety and independence for seniors. In paper [5], an all-in-one intelligent safety system for women security integrates real-time tracking, emergency alerts, and preventive features, ensuring comprehensive protection in any situation. A Comprehensive Survey on IoT based smart safety devices for Women [6], the survey explores innovative IoT-based safety devices designed to enhance women's security through real-time monitoring and emergency response features.

The prototype integrates RFID and GPS technologies to create an intelligent safety [7], ensures real-time tracking and alerts for women's safety. A smart watch for women security based on IoT concept watch me [8]. Watch me is a smart watch designed for women's security, leveraging IoT technology to provide real-time location tracking and emergency alerts. A Survey on women safety device Using IoT is dealt in paper [9]. The survey examines the effectiveness and innovation of IoT-based devices aimed at enhancing women's safety in various environments. Smart wearable device for women safety using IoT is seen in paper [10]. The smart wearable device leverages IoT technology to provide women with real-time safety alerts and location tracking for enhanced personal security. A women's self-defence device [11] empowers personal safety by offering quick-response mechanisms, such as alarms and alerts, to deter threats and seek immediate assistance. An android based security alert system for female is referred in paper [12]. An Android-based security alert system for females provides real-time location tracking and emergency notifications, enabling rapid response in unsafe situations.

III. BLOCK DIAGRAM

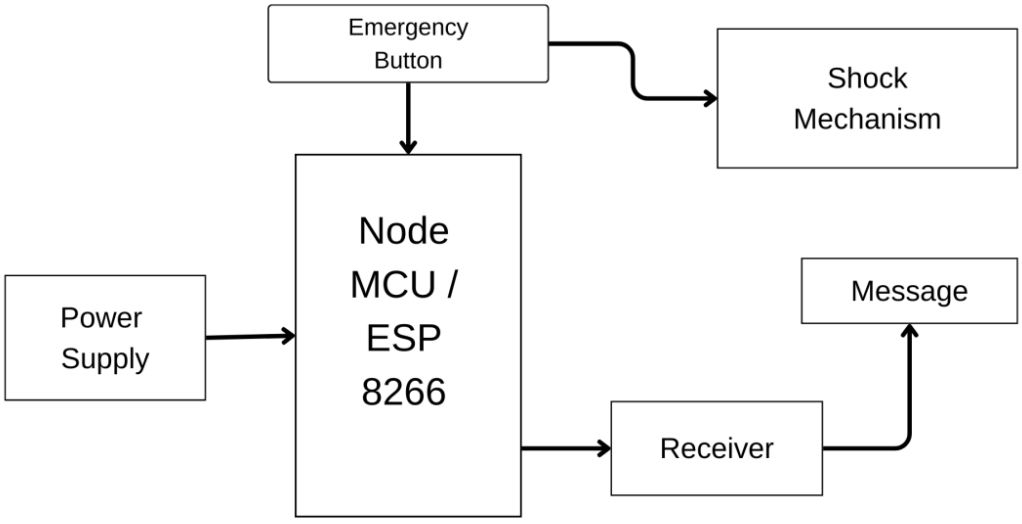

Figure 1. Block diagram of the self defence smart device

The block diagram as shown in Fig 1 appears to represent a system designed for emergency response, possibly in a safety or security context. Here's a breakdown of the components and their connections:

3.1 Node MCU / ESP8266

This is the central microcontroller, likely responsible for handling inputs and outputs. The ESP8266 is a Wi-Fi-enabled module as shown in Fig 2 is often used for IoT (Internet of Things) projects.

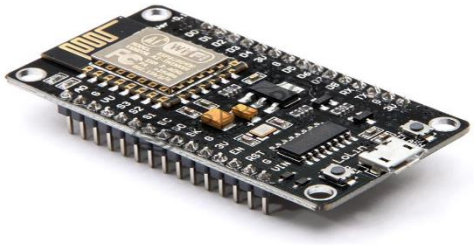

Figure 2. Node MCU

3.2 Power Supply

It Provides electrical power to the Node MCU / ESP8266 to ensure it functions.

3.3 Emergency Button

This input is connected to the Node MCU/ESP8266. When pressed, it likely triggers an emergency protocol in the system as shown in Fig 3.

Figure 3. Push Button

3.4 Shock Mechanism

This is activated by the Node MCU/ESP8266 after the emergency button is pressed, possibly delivering a shock in some form as shown in Fig 4, though the exact nature of the shock mechanism isn't clear (maybe an alert system, deterrent, etc.).

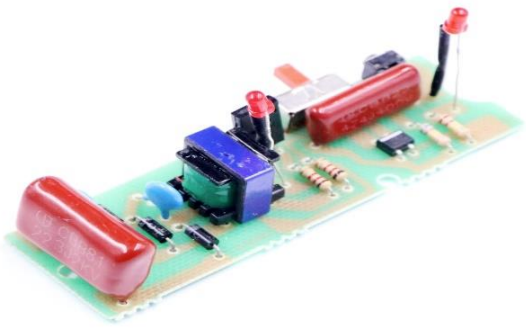

Figure 4. Shock Mechanism Circuit

3.5 Receiver

It is connected to the Node MCU/ESP8266, this likely receives wireless signals. The system could be sending out a signal to a remote location or device when the emergency button is pressed.

3.6 Message

The receiver communicates or sends out a message after receiving a signal. This could be a warning or notification sent over a network.

IV. FUNCTIONALITY OVERVIEW

When the ‘Emergency Button’ is pressed, the ‘Node MCU/ESP8266’ triggers both the ‘Shock Mechanism’ (likely some physical deterrent or warning) and sends a signal via the ‘Receiver’ to send an emergency ‘Message’ to a remote system or network.

This setup could be used in situations where an emergency alert is needed, such as personal safety devices, alert systems, or security mechanisms. The ESP8266's Wi-Fi capability suggests that the message could be sent over the internet to notify others in real time.

V. WORKING METHODOLOGY

5.1 Self-Defence Mechanism

The self-defence feature consists of an electric shock mechanism. This system is activated when the user presses an emergency button on the device. Upon activation, a controlled electric shock is delivered to the attacker, providing immediate physical protection. The shock is strong enough to temporarily incapacitate or disorient the attacker, allowing the user to escape or create a window to call for further help. This feature serves as the first line of defense, ensuring that women have a physical means to deter attackers when in danger.

5.2 Smart Device with SMS Alert

In addition to self-defence, the smart alert system provides a critical communication link. The device is equipped with a microcontroller that manages the coordination of the alert process. When the emergency button is pressed, the microcontroller triggers a GPS module to capture the user’s precise location in the form of latitude and longitude coordinates. This data is then processed and transmitted using a GSM modem, which sends an SMS containing the user’s location to pre-set emergency contacts, including authorities or trusted individuals. The microcontroller ensures that the location data is accurate and that the SMS is sent in real-time. This means that even if the user cannot verbally communicate or explain their situation, the emergency contacts will receive the user’s location and can take immediate action to provide assistance. Additionally, the system could be designed to trigger both the self-defence and alert mechanisms simultaneously, ensuring a quick response from both the device and emergency services as shown in Fig 5- 7.

VI. WORKING MODEL

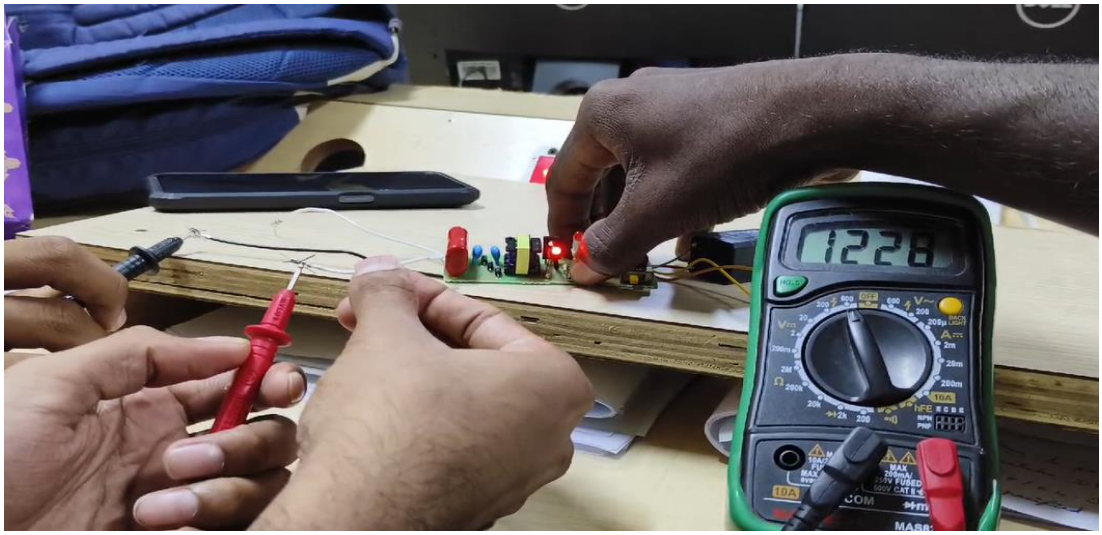

Figure 5. Output in Volts

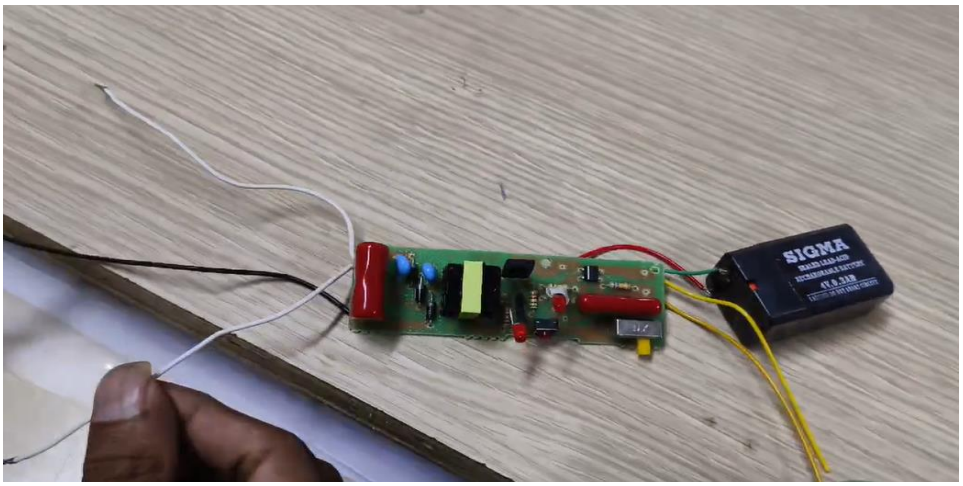

Figure 6. Hardware Working

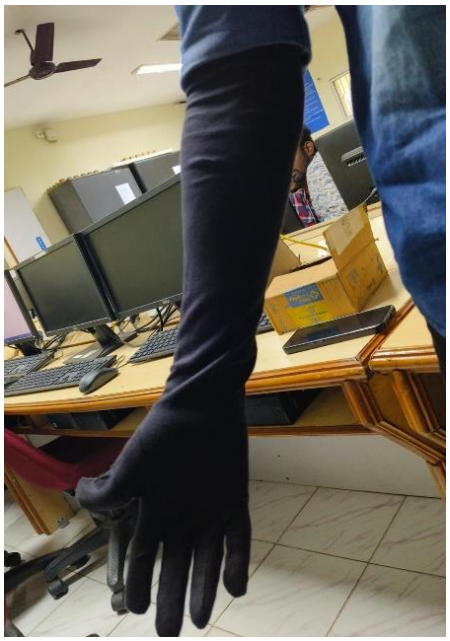

Figure 7. Hardware Attached with sleeve

VII. FUTURE ENCHANCEMENT

The location of the victim to be added by the help of GPS module.

VIII. CONCLUSION

The development of a self-defence smart device holds the potential to significantly enhance personal safety and security in unpredictable situations. By integrating cutting-edge technologies such as GPS tracking, emergency alerts, and real-time communication features, these devices empower individuals to respond quickly and effectively to threats. The ease of use, portability, and discreet design further ensure that users can access the device in high-pressure moments without drawing attention. While the device's technological capabilities are impressive, its effectiveness is still contingent on factors such as battery life, connectivity, and user familiarity with the features. Moreover, ensuring the device is accessible to a broad demographic requires consideration of affordability and simplicity.

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