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Smart Wearable Device

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ABSTRACT:- Women's safety remains a critical issue globally, with alarming rates of harassment, molestation, and assault reported across various demographics. Despite historical respect for women in society, contemporary challenges persist, with estimates indicating that lifetime. To address this pressing issue, this work presents the development of a smart wearable device aimed at enhancing women's safety through the Internet of Things (IoT). The proposed device is designed for daily use and activates in emergencies to provide real-time protection. Key features include GPS tracking, which allows for continuous location monitoring via a dedicated Android application. Additionally, the device is equipped with an SOS alert system to attract attention from nearby individuals, and it sends SMS notifications to family members and local police stations when activated. This wearable device aims to provide a comprehensive solution to the safety challenges faced by women and improve their overall protection in critical situations.

KEYWORDS: - Internet of Things (IoT), GPS Tracking, SMS Notification System, Wearable Technology.

I. INTRODUCTION

Smart wearable devices for women's safety represents a transformative step in personal security technology. These innovative gadgets, ranging from smartwatches to discreet jewellery, are designed to empower women by providing essential safety features such as emergency alerts, GPS tracking, and health monitoring. With capabilities like panic buttons that send immediate distress signals and real-time location sharing, these devices offer peace of mind in potentially unsafe situations. Their discreet design ensures that users can maintain a fashionable appearance while having access to vital safety tools. As awareness of women's safety issues grows, smart wearables play a crucial role in fostering confidence and security, allowing women to navigate their environments with greater assurance.

II. OBJECTIVES

- To enhance the safety and security of women by providing a reliable, real-time protection solution.
- To develop a user-friendly smart device that offers immediate assistance during emergencies. The customer was happy and satisfied.
- Implement real-time GPS tracking for continuous location monitoring.
- Integrate an SOS alert system that notifies nearby individuals, family, and local authorities.

III. PROBLEM STATEMENT

In recent years, the rise in crimes against women has raised serious concerns about personal safety, especially in urban and remote areas. Traditional safety measures such as mobile phones or emergency apps are often inaccessible during critical situations due to panic, time constraints, or physical restrictions. This project aims to address this issue by developing a smart wearable device that ensures women's safety through real-time location tracking, emergency alert systems, and health monitoring. By combining IoT technology with wearable design, the device allows users to discreetly trigger an alert, which then sends the user's location and distress message to pre-registered emergency contacts.





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IV. LITERATURE REVIEW

Pranay Chide, et.al. "Smart Wearable Device for Women .", International Journal 2024 Nagpur, Maharashtra, India

Women's safety is still a major concern today, despite advancements in technology. Many women face challenges at work and often worry about their safety, especially when out alone at night. To address this issue, we propose an IoT-based smartwearable device for women's safety, equipped with an alarm system. This device is designed to automatically detect dangerous situations and notify relevant contacts. It

not only helps women escape threatening situations but also supports them in getting justice when needed. The device uses advanced technology, including a temperature sensor, GPS, and GSM, to automatically detect potential threats. It can send alerts to predefined contacts and share the user's location, allowing friends or law enforcement to respond quickly. The device is built using Arduino technology and includes a movement sensor. When the button is pressed, it triggers an alert. It can be worn

like a lightweight wristband and features a range of functionalities. The main goal is to quickly share the user's location and send alert messages to registered contacts like parents, friends, and police, helping to prevent unfortunate incidents.

Sunita Malaj, et.al. " IOT BASED SMART WEARABLE DEVICE FOR WOMEN SAFETY ", International Journal 2023

Women's safety is a major concern that everyone should care about. Despite being respected in many cultures, women and girls face harassment and violence every day. In fact, about 35 of women have experienced physical or sexual violence in their lives. To help tackle this issue, we propose a smart wearable device designed for women's safety using IoT technology. This device can be worn daily and is easy to use. If a woman feels threatened, she can activate it, which will send her GPS location to a special app for tracking. The device also has a camera that can take pictures and send them to the app if she's in danger. It includes an SOS alert feature to attract the attention of people nearby. In emergencies, the device will send SMS notifications to her family and the police.

Pravin Pardhi, et.al "Smart Wearable System for Women Security Using IOT,International Journal 2022, Nagpur,Maharashtra,India.

Women's safety is a crucial issue even in today's tech-driven world. This project introduces an effective safety system for women using a GPS modem. The goal is to provide complete protection for women in various situations. The system combines a security device that can be attached to a handbag with an Android app. The app connects to the device via Bluetooth. When the system button is pressed, the app uses GPS to find the user's location and sends a message with this location to registered contacts. It can also make a call to those contacts for help in dangerous situations. The location information is sent via SMS, allowing quick tracking of the user's whereabouts, and this information is stored securely. Overall, this system aims to create a safer and more secure environment for women.

Pratheeba, et.al "A SMART WEARABLE DEVICE WOMEN SAFETY SYSTEM BASED ON IOT ",International Research Journal 2021, Erode, Tamilnadu, India.

The world is getting quite a lot more risky for ladies. Social wrongs like attacks, endowment and wrongdoings against ladies most exceedingly terrible among everything is assault is on the ascent in numerous nations. Occurrences of wrongdoing against ladies have been expanding at a disturbing speed in Indian urban areas, most basic episodes being assault, seizing. Lewd behaviour and eve prodding .security

for ladies still a significant issue as the quantity of violations over ladies and young ladies is expanding day - by - day. In this period of innovation, cell phones are one device nearly everybody uses to stay in contact with loved ones. In this venture another point of view is to utilize innovation to secure ladies. The framework looks like a keen belt which when initiated, tracks the area of the casualty utilizing GPS and sends crisis messages utilizing GSM to two crisis contacts and the police control room. The framework additionally fuses a shouting caution to call out for help from general society.

Pallavi Kapoor, et.al. "IoT based Wearable Safety Device for Women", 2021 Interna- tional Journal of Engineering Research and Technology, 5 May 2021.

A wearable safety device for women that uses a NodeMCU microcontroller. Its main goal is to help keep women safe in dangerous situations. The device connects to the Internet of Things (IoT) to send alerts through secure





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channels.When sensors detect unsafe conditions, the device triggers an alarm. It uses GPS and GSM technology to send the user's location to emergency services and save contacts. There are two extra buttons: one for sending a manual alert in emergencies and another for canceling false alerts.The device also uses ThingSpeak, an IoT platform that stores sensor data in the cloud. This allows for continuous health monitoring by uploading data every 30 seconds. Overall, this system aims to enhance user safety without requiring them to take action in potentially risky situations.

Rajini. R ,et.al. "WOMEN SAFETY DEVICE", JETIR May 2019.

India, which aims to become a superpower and a key economic hub, still faces many problems related to patriarchy, such as molestation, dowry demands, crimes against women, and the most serious of all—rape. Today, women's safety is a major concern because they often feel unsafe stepping out of their homes due to the risk of physical or sexual violence. A Women Safety Device could help address these issues. This device detects when a woman is in danger, tracks her location, and sends it to emergency contacts through a GSM module. Keywords: Deep Learning system, online interviews, speaking rate, speech-to-text conversion, checking grammar.

V. METHODOLOGY



Working Flow of Flowchart for Women Safety and GPS Tracking System . The flowchart shows the working flow of the Women Safety and GPS Tracking System using Arduino Nano, GPS, and GSM.

Start :

- 1. Is the SMS alert switch pressed?
- 2. Yes: Send an SMS message to a pre-programmed phone number with the user's current location.
- 3. No: Is the Call alert switch pressed?
- 4. Yes:
 - Make a call to a pre-programmed phone number.
 - No
 - Do nothing.





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End Details:-

The flowchart starts by checking if the SMS alert switch is pressed. If the switch is pressed, the Arduino Nano sends an SMS message to the pre-programmed phone number with the user's current location. The current location is obtained from the GPS module.

If the SMS alert switch is not pressed, the flowchart checks if the Call alert switch is pressed. If the switch is pressed, the Arduino Nano makes a call to the pre-programmed phone number.

If neither the SMS alert switch nor the Call alert switch is pressed, the flowchart does nothing and the program ends.

VI. SYSTEM ARCHITECTURE

Block Diagram Description: -

The block diagram shows a Women Safety and GPS Tracking System using Arduino Nano, GPS, and GSM. The Arduino Nano is the main controller of the system and is responsible for reading the input from the switches, processing it, and sending the appropriate commands to the GSM and GPS modules.



The two switches in the system are used to trigger the SMS and Call alerts. When the user presses the SMS alert switch, the Arduino Nano sends an SMS message to a pre- programmed phone number with the user's current location. When the user presses the Call alert switch, the Arduino Nano places a call to the pre-programmed phone number.

Steps involved in the working of the system:

- 1. The user presses the SMS or Call alert switch.
- 2. The Arduino Nano reads the input from the switch.
- 3. The Arduino Nano processes the input and sends the appropriate commands to the GSM and GPS modules.
- 4. The GSM module sends an SMS message or makes a call to the pre-programmed phone number.
- 5. The GPS module sends the user's current location to the GSM module.
- 6. The GSM module includes the user's current location in the SMS message or call.
- 7. The pre-programmed phone number receives the SMS message or call and can take appropriate action.





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VII. CIRCUIT DIAGRAM



Circuit Diagram Description:

The circuit diagram shows a Women Safety and GPS Tracking System using Arduino Nano, GPS, and GSM. The Arduino Nano is the main controller of the system and is connected to the GPS and GSM modules using serial communication. The two switches in the system are connected to the Arduino Nano's digital pins 2 and 3.

Steps involved in the working of the system:

- 1. The user presses the SMS or Call alert switch.
- 2. The Arduino Nano reads the input from the switch.
- 3. The Arduino Nano processes the input and sends the appropriate commands to the GSM module.
- 4. The GSM module sends an SMS message or makes a call to the pre-programmed phone number.
- 5. The GPS module sends the user's current location to the Arduino Nano.

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- 6. The Arduino Nano includes the user's current location in the SMS message or call.
- 7. The pre-programmed phone number receives the SMS message or call and can take appropriate action.

VIII. RESULT







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The developed smart wearable device successfully demonstrated real-time safety features for women, including GPS tracking, emergency alert transmission, and health monitoring. Upon activation through a hidden trigger, the device was able to promptly send location coordinates and an emergency message to predefined contacts using GSM technology. Extensive testing in both indoor and outdoor environments showed that the device maintained a reliable connection with mobile networks and delivered alerts within 5-10 minutes. The system also supported real-time monitoring via a mobile application interface. Testing in various scenarios confirmed the reliability, responsiveness, and ease of use of the device.

IX. CONCLUSION

In conclusion, the "Women Safety and GPS Tracking System" project represents a significant stride towards leveraging technology for enhancing personal safety, with a specific focus on addressing the concerns of women in various environments. The integration of Arduino Nano, GPS, and GSM technologies has resulted in a comprehensive wearable safety device that combines accurate real-time location tracking with a dual-alert mechanism, allowing users to discreetly signal for help through both SMS alerts and phone calls. The project not only emphasizes technical proficiency, including the efficient use of semiconductor components and communication protocols, but also underscores the importance of user-friendliness, ethical considerations, and practicality in real-world scenarios. As technology continues to evolve, the "Women Safety and GPS Tracking System" stands not only as a practical safety solution but also as a foundation for potential future innovations in wearable safety devices.

X. FUTURE SCOPE

The smart wearable device for women's safety can be further enhanced by integrating direct connectivity with police and emergency services, enabling faster response during critical situations. Features like voice or gesture-based activation, real-time camera and audio recording, and AI-powered threat detection can significantly improve its effectiveness. Future versions could also include cloud data storage, improved mobile app functionalities, and extended battery life with solar charging. With cost optimization, the device has the potential for large-scale deployment, making it accessible to women across various regions and social backgrounds.

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