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Women Safety System Using Iot-Based Wearable Device With Gps And Gsm Integration

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Abstract—Women safety has emerged as a major concern. This paper presents an IoT-based wearable safety system using Arduino Uno, GPS, GSM, NodeMCU and multiple sensors for automatic emergency detection and alert generation. The system continuously monitors user conditions and sends location-enabled emergency notifications. This paper presents a novel wearable device integrating multiple advanced sensors for woman safety.

Keywords—Women Safety, IoT, GPS, GSM, Arduino, Wearable Device

I. INTRODUCTION

Women safety remains a major concern. This work proposes a wearable safety device capable of monitoring physiological and environmental conditions and sending alerts automatically. Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places. Existing handheld devices that are available for women's safety require women's intervention to activate them such as pressing the button or shaking the device after sensing the danger. However, for some reason if a woman has no time to activate it when she is in danger, the purpose of the safety device is not solved.

In 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. According to a report by Thomson Reuters Foundation, India is ranked as a highly dangerous place for women worldwide, India has the greatest number of child brides as well. In today's World the safety of women is in danger especially in India. The rate of crimes against women is not decreasing but in fact increasing at an alarming rate especially harassment, molestation, eve-teasing, rape, kidnapping and domestic violence. Many preventive measures have been taken by the government to stop these misbehaving activities but still has not affected the growing rate of these crimes and has remained unaffected.

Students face incidents like child trafficking and kidnapping, when they are waiting to embark or disembark a school bus. Loaded with security apps for women, smart phone can help to send emergency alerts to the chosen people and also let people know if anything goes wrong. Sometimes there might be a situation that when women had an accident in the late night and there are no one to help them, in such situations the person will not be able to tell the situation that he/she facing. And they do not know the basic first-aid details and to know the person where the incident has happened. Now a days though there are many apps and devices evolved for women's safety via smart phone which can be activated only by a touch or one click or shake the mobile.

II. LITERATURE REVIEW

Various researchers have proposed GPS-GSM tracking devices, panic button systems, and IoT-enabled wearable devices. Most existing systems suffer from limitations related to automation, accessibility, and reliability. Existing systems rely on smartphone applications, panic buttons, GPS-GSM trackers, and IoT-enabled monitoring devices. Limitations include battery dependency and manual activation. Dr. C K Gomathy et

al., of Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya (2021) proposed the project which presents a wearable safety device for women using the Arduino. The purpose of this device is to safeguard women in the event they might face any danger. The device uses a wireless sensor network to communicate and to send alerts to them. The GPS and GSM are used to share the user's location directly to the relevant authorities and saved contacts.

The switch in the device works for sending manual alerts in case of emergency and as a panic switch to get the shock, then the Buzzer will also activate along with the laser diode. In this paper, a mobile-based application (I safe apps) is developed with android support to know whether a woman is safe. It gives the location of the woman in danger by giving fake phone calls, video forwarding, location and first-aid information.

III. PROBLEM STATEMENT

Many safety solutions fail when users cannot access phones or manually trigger alerts during emergencies.

IV. PROPOSED METHODOLOGY

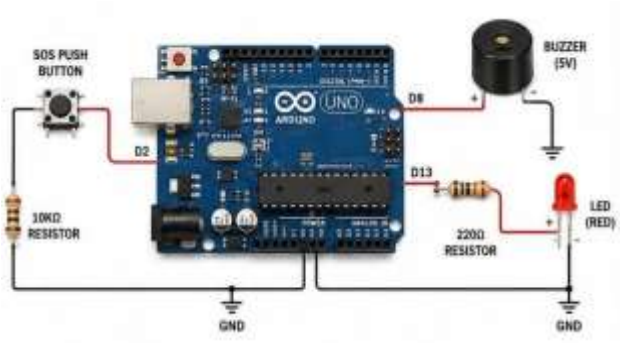
The system uses Arduino Uno, GPS, GSM, NodeMCU, heartbeat, vibration, pressure, temperature and MEMS sensors. Emergency conditions trigger automatic alert transmission. The footwear will have button in its front and which may be pressed in case of emergency and it will send alerts which will aid in girls' safety.

V. SYSTEM ARCHITECTURE

Sensor data is processed by the controller. GPS determines location while GSM sends SMS alerts. IoT connectivity enables remote monitoring. Alerts are sent in quick time resulting in fast action.

I. Hardware Components Arduino Uno serves as the controller. GPS provides location tracking, GSM handles communication, and sensors monitor user conditions. SOS Push button activates the alert mechanism and buzzer is also used to alert the surrounding about a potential risk.

VI. CIRCUIT DIAGRAM



VII. RESULTS AND DISCUSSION

The prototype successfully generated alerts and transmitted location information. The system demonstrated reliability, portability, and low cost.The prototype successfully generated alerts and transmitted location information. The system demonstrated reliability, portability, and low cost.The prototype successfully generated alerts and transmitted location information. The system demonstrated reliability, portability, and low cost.The prototype successfully generated alerts and transmitted location information. The system demonstrated reliability, portability, and low cost.

VIII. ADVANTAGES AND LIMITATIONS

Advantages include real-time tracking and emergency response in which assistance can be provided in real quick time. Limitations include GSM coverage dependence and GPS accuracy indoors.

IX. FUTURE SCOPE

Future work includes AI-based threat detection, mobile application integration, cloud analytics, and evidence collection. Integration of systems with mobile applications may solve the various problems and make the system more robust.

X. CONCLUSION

The proposed IoT-based women safety system offers an effective and economical approach for emergency assistance and user protection. This will enhance women's safety and will make this world a safer place for females.

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