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Womens Safety Device with GPS Tracking and Alert

Sanskruti Ukirade^{*1}, Shruti Kanse^{*2}, Shrushti Albanna^{*3}, Vaishnavi Kasbe^{*4}, Mrs.T.S .Bangali^{*5}

Department of Electronics and Telecommunication Engineering, Jaywantrao Sawant Polytechnic, Pune,

Maharastra, India ^{*1*2*3*4}

Professor, Department of Electronics and Telecommunication Engineering, Jaywantrao Sawant Polytechnic, Pune,

Maharastra, India ^{*5}

ABSTRACT: In today's world, the safety of women has become a critical issue due to the rising incidents of violence. Despite numerous efforts to enhance security, crimes such as harassment, assault, and rape continue to pose a significant threat. To address this issue, we propose a Women's Safety Device with GPS Tracking and Alert System that enhances security and provides immediate assistance in emergencies. This device is equipped with GPS and GSM technology to send the victim's location to preprogrammed emergency contacts. It also features a buzzer to alert nearby people, a pulse rate sensor that transmits data to the ThingSpeak cloud via WiFi ESP8266, and a shock mechanism to help the victim temporarily disable the attacker. This multi-functional device is a compact and effective solution for women's safety, allowing them to seek help and defend themselves in critical situations.

I. INTRODUCTION

The increasing number of crimes against women has raised concerns worldwide. In India, cases of harassment, assault, and rape have increased despite stricter laws and awareness campaigns. Women working late at night or traveling alone often feel unsafe due to the lack of quick emergency response systems. The proposed Women's Safety Device with GPS Tracking and Alert is designed to provide real-time assistance and self-defense mechanisms. The integration of GPS, GSM, pulse monitoring, buzzer, and shock mechanism ensures that women have a tool to protect themselves and alert authorities in distressing situations. This paper presents the working, implementation, and effectiveness of this device in enhancing women's security.

II. METHODOLOGY

1. Hardware Components

Power Supply: We have used a battery of 12V as a power supply. This supply battery is connected to the Arduino Nano controller.

Atmega328: Whole assembly is controlled and managed using a preprogrammed controller Arduino Nano within a device

GSM Module: The GSM module used is SIM800c. It has a low power consumption and can send voice SMS and data

GPS Module: GPS (Global positioning system) is used to get the position of the gadget in terms of latitude and longitude.

Buzzer: A Buzzer is provided with a separate key. By pressing it, the buzzer will produce a continuous beeping sound.

Shock Circuit: This device includes a shock circuit which is a part of mosquito repellent bat's shock circuitry.

Pulse Sensor: Pulse wave is the change in volume of blood vessels that occurs when the heart pumps blood & detector that monitors volume changes called Pulse sensor.

LCD Board: Here, the connections are made such that the power supply as well as controllers are connected to the LCD.

Software Components

Thingspeak: ThingSpeak is an open data platform of IOT, that enables collect, store, analyze, visualize and act on data from the cloud.



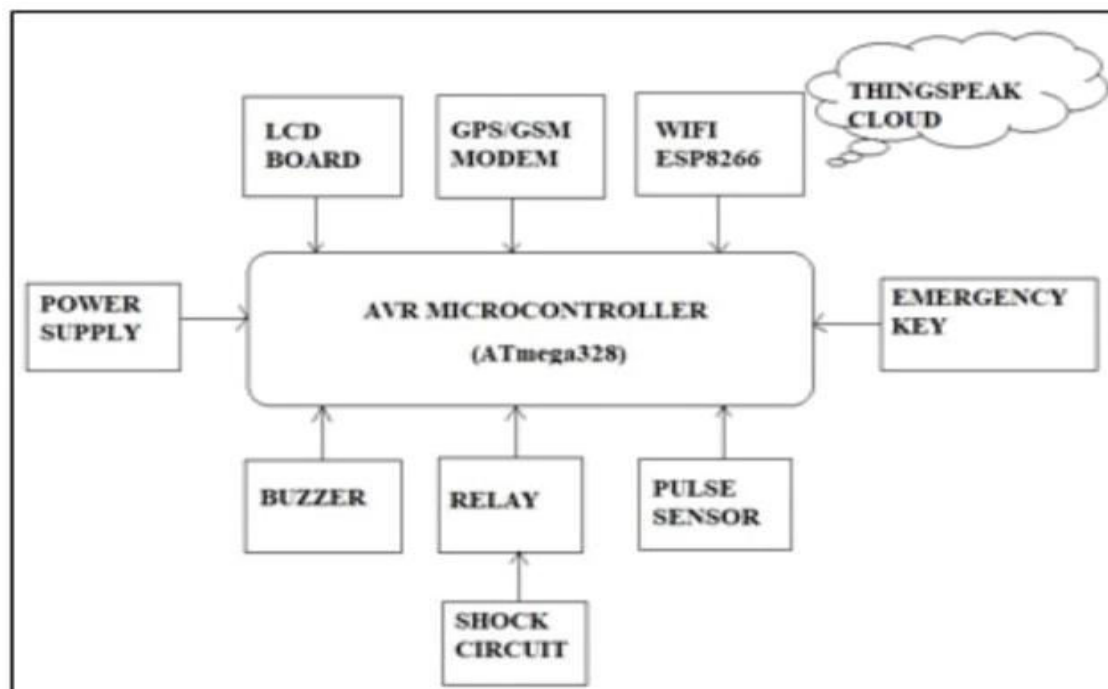
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Arduino IDE: The proposed device is basically a controller based emergency kit which works when preprogrammed instructions guide a path accordingly

III. MODELING AND ANALYSIS

Block Diagram



Working

The proposed device consists of a system that ensures security and real time notification to the near and dear in case of emergency. As soon as the emergency button is pressed the device ensures continuous monitoring of location as well as security in the form of 2400V stun current.

The emergency key is directly connected to the atmega328 controller of Arduino Nano. This activates the controller and sends alerts to other devices interfaced with it.

The location coordinates of that instant will be collected using the GPS module and will be sent via text message mode with the help of AT commands of the GSM module.

The LCD connected to arduino Nano will display a message “location sending” while tracing the location and “location sent” after coordinates are sent.

Here, a pulse sensor is an expandable device. In this case, as soon as the main switch is pressed, the pulse rate will be calculated. The numerical value of pulse rate will directly be displayed on LCD and graphical representation will be shown on thingspeak cloud using a well-known wireless protocol “wifi ESP8266”. This graph will results the change in pulse rate(y axis) after every minute(w.r.t x axis). Now,In addition to GPS location, user’s concerned will receive a pulse rate in BPM via text.

The process of sending location coordinates as well as pulse rate will take place within a gap of one minute . but, these parameters can be achieved within a gap of 2/3 minutes by adding required delay.

For more protection our kit includes two more parameters viz., a buzzer and shock circuit. These two components are heaving separate buttons. In that case, to alert nearby people by pressing a button the buzzer will produce a continuous beeping sound and with that the location will be sent.



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For shock circuit, a mosquito repellent bat's shock circuitry is used. For instantaneous protection a separate button is provided which will generate a shock in milliamps, enough to move apart. And by this process the whole circuit will work in accordance. The required power will be supplied to all components as per need using a 12v main supply.

IV. RESULTS AND DISCUSSION

The prototype was tested under different scenarios to evaluate its efficiency:

Location Tracking Accuracy: The GPS module successfully provided the victim's real-time location with an accuracy of 5-10 meters.

Emergency Alert System: The GSM module was able to send alert messages to preprogrammed contacts within 5-10 seconds.

Buzzer Response: The buzzer was loud enough to attract attention within a 10-meter radius.

Pulse Monitoring: The ThingSpeak cloud stored real-time pulse data, which could be accessed remotely.

Shock Mechanism Efficiency: The shock mechanism provided a temporary disabling effect on an attacker without causing serious harm.

These results indicate that the device can be an effective women's safety tool in emergencies.

D. Limitations and Future Scope

Limitations

1. Limited battery life
2. Dependence on GPS and GSM signals
3. Potential for misuse of the electric shock mechanism

Future Scope

1. Improving battery life and device durability
2. Integrating additional features, such as voice assistants or emergency buttons
3. Conducting larger-scale user testing and feedback implementation

V. CONCLUSION

The Women's Safety Device with GPS Tracking and Alert provides a multi-functional solution to enhance security. It ensures quick response through location tracking, alerts nearby individuals via a buzzer, monitors health status, and incorporates a self-defense mechanism. This device can be beneficial for women in distress, particularly in isolated areas or during late hours. Future enhancements could include integrating AI for automatic distress detection, adding a voice-recognition SOS feature, and improving battery life for prolonged usage.

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REFERENCES

1. Ramesh, P., & Sharma, K. (2023). "Smart Wearable for Women's Safety: A Review." International Journal of Smart Technologies, 12(4), 56-72.
2. Kumar, S. (2022). "GPS and GSM-Based Tracking Systems for Safety Applications." IEEE Transactions on IoT and Security, 9(3), 112-125.
3. Government of India, Ministry of Women and Child Development. (2024). "Women Safety Initiatives and Technology Interventions."
4. ThingSpeak Cloud Documentation - www.mathworks.com/thingspeak
5. ESP8266 WiFi Module Datasheet - www.espressif.com



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