iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VII **Month of publication:** July 2022

DOI: https://doi.org/10.22214/ijraset.2022.45498

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VII July 2022- Available at www.ijraset.com

SOS Ring: Save Your Soul Ring

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Abstract: ***In today's date, women face physical harassment in public places, schools and at workplaces or while traveling. Most cases of physical harassment take place when women are alone or while traveling.[8] Women safety has been a big concern and it has been the most important duty of every person. Women feel insecure to step outside their house.[8] Many of us make their possible efforts to stop such problem but, they faced some issue. There are so many applications and devices are built to prevent women from assault but unfortunately it is not much enough. There are many android applications for Smartphone's but for those who don't use Smartphone's or those who cannot keep their mobile handy at their workplace;[8] this proposed system will be helpful. The system suggests a smart wearable device for security which contains different modules such as GSM, GPS. The proposed system helps women in emergency situation by activating the modules on clicking the switch and provides emergency self-defense.[8]***

Keywords: Node MCU, GPS Module, Jumper Wires, Push Button

I. INTRODUCTION

From earlier times molestation is a big issue and it is a major threat to our society. In day-to-day life this problem makes a huge impact on peoples and especially on women in our society. It also helps the women deal with the problems faced in the past and achieve fair justification and morality in the society. Except this there is also increased in physical harassment and molestation. According to the WHO (World Health Organization) 35% women are experienced physical and sexual violence. Even in developed countries physical and sexual violence are unfortunately too common.[9] The safety and security of a woman can never be at rest, no matter what new device is on the market or no matter how nice a new application is made, there always can be something added to it. This made a huge impact on peoples thinking and especially on youths. This is the reason women facing insecurity.

"SAVE YOUR SOUL" Ring works on IOT based software. It will connect to any portable device within few steps, and helps for easy access. Just by selecting necessary contacts, it will send an SOS message and call to the selected contacts. Also, to the nearest control room with the help of GPS System. This is a least expensive ring. This will give a desire security and help the victim in emergency situation. By keeping all these things in mind many safety devices have been made and few of them are discussed in this paper.

II. LITERATURE REVIEW

The Women Security is one of the major issues in the world. In today's scenario, the women empowerment is the focus of every society, as well as many tools and devices have been developed by many researchers. The literature review has been done from some of the articles.

In Paper [1] authors explained to protect the protection of working women and school children, and we are creating a prototype to serve our purpose. These embedded devices have a warning emergency push-button and an electronic camera to acquire this example image. The GSM device monitors the victim's current location and sends a recorded contact warning message. Images are taken by the embedded camera and sent with a warning note. Our system consists of a school bus surveillance system for children's travel. With the assistance of sensors, over-speed tracking is also carried out. If the speed of the vehicle goes above the defined speed value, the warning message is transmitted from the system to the mobile device of the driver.

In Paper [2] authors explained the task includes the utilization of Arduino, movement sensor, signal, and a straightforward program. At the point when switch is on that will triggers the alert. It will likewise send the sign to Arduino which procedures the sign and set off the alert alongside discovery message in plain view. With this framework we can without much of a stretch set up a security caution for undesirable badgering.

The requirement for lady's security frameworks these days is a genuine interest. As the quantity of wrongdoings are expanding each day, there must be something that will protect us. We are for the most part mindful of the top-of-the-line security frameworks present in the market yet they are not effectively accessible to everybody.

We in this manner plan to give an answer by developing a value proficient electronic framework has the capacity of detecting the movement of the gate crashers and setting off the caution. The essential thought is undertaking is that all is by triggering a basic switch on account of crisis.

In Paper [3] authors presented 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 wireless sensors network to communicate and to send alerts to them. The GPS and GSM are used to share the used to share the user's location directly to the relevant authorities and saved contacts. The switch in the device work for sending manual alerts in case of emergency and as panic switch to get the shock, then the Buzzer will also activate along laser diode. In this project an alternative approach for device switching which combines fingerprint identification technique with web server and GPS functionalities has been proposed.

In Paper [4] authors proposed APE device was built as a wearable device that will automatically spray pepper on the attacker initiated with an alarm by a button or by a signature move of the victim. Numerous safety devices based on IoT exist for women to employ. However, each device comes with its own challenges. They propose to design advice that will bridle these challenges. Based on the study undertaken, we realize that a safety device should first grant the victim the control of the situation. Hence, it was decided that the attacker must first be struck or distracted that will yield some valuable time for the victim to probably contact a safe-house or run to safety. This device was primarily designed to enable the victim to take the first strike. The proposed device is a wristband with pepper capsules, worn on the hand and hence to avoid the risk of the victim being sprayed, a better alternative was looked out for.

In Paper [5] authors focus on developing a prototype that is a smart device that can be worn by any individual on their wrists. The band is always active; the victim needs to tap on the screen twice when she feels the need of it or she feels someone is abusing her. After tapping on the screen, the device will start sending the current latitudinal and longitudinal co-ordinates to the ICE contacts and the police control room. The device consists of a piezo buzzer that emits beep sound after 1 minute of actual activation of the device. The range of the buzzer covers up to 50 meters of radius. If the suspect tries to remove the band and throw it, the force sensors will start working and buzzer will start ringing and the location at that particular time will be sent. On the top of the band there are two nodes which will emit electric current as soon as it comes in contact with any surface after the device is activated. The current is generated with the help of leakage current. The device and the smart phone are connected using Bluetooth, which is responsible for the overall data sharing and connectivity. The heart of the device is Arduino which controls the entire device prototype. OLED screen is used as the UI for the device. A captative touch is used for carrying out the touch functionality of the screen. It is attached on the OLED screen.

In Paper [6] authors this Capstone project entitled, Athena: A Mobile Based Application for Women's Safety with GPS Tracking and Police Notification for Rizal Province, is intended to provide help to authorities prevent crimes before it happens. System users can also aid the authorities to the immediate track possible offenders around their respective area. The app is recommended to be used by women and teenagers. The following software were used to complete the mobile application: Android Studio Version 3 and JavaScript as a programming language for the coding of the program, HTML and Inkscape for the aesthetic design. The system interface provides three buttons. In Paper [7] authors system proposed for the abnormal state of security to the lady. These days, women are confronting a ton of issues in the general public.

They need a security which doesn't have any proviso in it. Each system has escape clause yet in this undertaking, it fixed the openings in augmenting. References to all the current system it will make ready to high wellbeing process. This system is managing the Bluetooth low vitality gadget and the android application. It joins the exceptional highlights, for example, dynamic GPS, voice acknowledgment sensor and furthermore a reconciliation of the current applications. It can send messages and make calls by squeezing the single catch of the gadget. And furthermore, the alarm is sent through the application by voice acknowledgment when the individual calls for help. Bluetooth low vitality gadget which is associated with the android application recognizes the present area and sends the message that the lady is stuck in an unfortunate situation. At the point when the catch is held for long then the area can be followed even, they moved from the specific spot. This gadget is coordinated with Taser which is an electroshock it upon and it serves to the individual for the defencing reason.

In this Paper [8] the authors proposed design will help the girl when she is in danger zone. She can make a rescue of herself in dangerous situations. And this circuit will use to remove or decrease the tension of girl when she walks alone at night hour also so that she will never feel helpless in any situation by herself. The crimes against women can be brought to an end with the help of real-time implementation of the proposed system. The system has been developed with such a motivation that it will leave no stone unturned to provide women with the safe environment under all the circumstances. As the system is fabricated into a jacket, no one would be able to evaluate whether it is a safety jacket or just a regular jacket.

III. METHODOLOGY

The device can be activated by just pressing the emergency button once. This device gets activated and sends instant location with a distress message to the police and preset number through a GSM module. The figure shows how the device looks like. And when the same button is long pressed it activated call to the police instant Location. The location is located using GPS. This GSM Modem (sim900) can accept any GSM network operator SIM card and just like a mobile phone with its own unique phone number. The plus point of using this modem will be that you can use its RS323 port to communicate and develop embedded applications. It can be used to send and receive SMS or make/receive voice calls

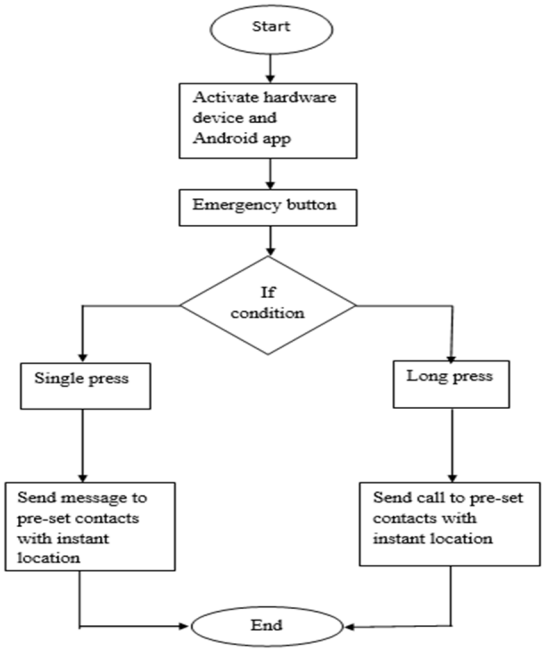

Fig.1 Flow Chart of SOS Ring

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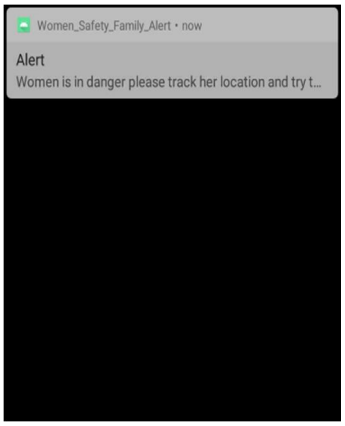


Fig.2 Alert Notification Generated After Pressing Emergency Button

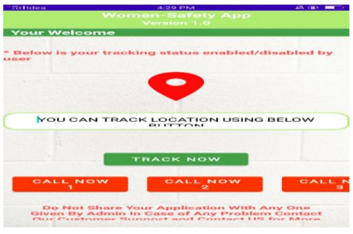


Fig.3 Tracking Location or Call to the Pre-set Contacts

Fig.4 Tracking the Location

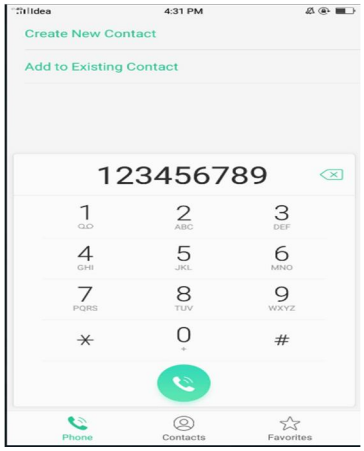


Fig.5 Call to the Pre-set Contacts

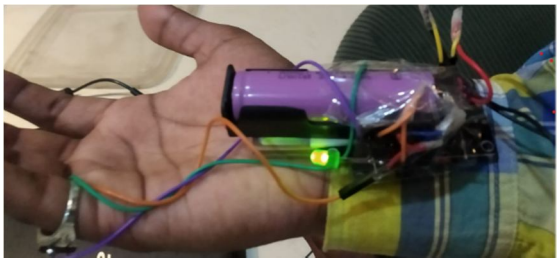
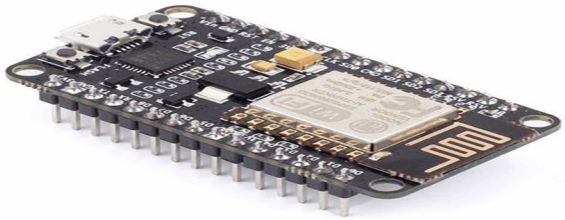


Fig.6 Overall Hardware Device

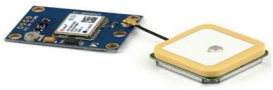
IV. REQUIREMENTS

A. *Hardware*

1) NodeMCU: NodeMCU is an open-source firmware for which open-source prototyping board designs are available. The name "NodeMCU" combines "node" and "MCU" (micro-controller unit). The term "NodeMCU" strictly speaking refers to the firmware rather than the associated development kits.



2) *GPS System:* The Global Positioning System (GPS) is a radio navigation system that determines precise and accurate location, velocity, and time regardless of weather conditions. Additionally, GPS works on land, air, and sea. GPS modules are devices that allow your devices or circuits to receive GPS data.



3) *Arduino Nano:* The Arduino Nano 33 IoT uses a ublox NINA-W102 Bluetooth and WIFI module for its wireless communications functions. This module contains an ESP-32 chip and has an integrate antenna. The NIN-W102 can provide Bluetooth and BLE 4.2 host and slave services.

4) *Jumper wires:* Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed.

B. Software

1) *Arduino Software (IDE):* Arduino Software (IDE) connects to the Arduino boards to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called sketches.
2) *Firebase Database:* The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in Realtime to every connected client. When you build cross-platform apps with our Apple platforms, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.

C. Languages

1) *XML:* Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The design goals of XML focus on simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages.
2) *JAVA:* Java is an object-oriented programming language that produces software for multiple platforms. When a programmer writes a Java application, the compiled code (known as bytecode) runs on most operating systems (OS), including Windows, Linux and Mac OS. Java derives much of its syntax from the C and C++ programming languages.

V. CONCLUSIONS

The proposed design of the Women Safety Ring will help women to be safe in any critical situations like rape, harassment, molestation, etc. in the society. The prototype of the system developed is user friendly, cost effective and light weighted. Whenever a woman feels insecure or threatened, this system can be used to provide efficient results just by the push of a button. The system helps the victim to reach to the near and dear ones as soon as possible in case of emergencies. The programmed application stores the records audio as well as updates victim's location periodically. This is very helpful because in case of mobile phone damage we will still be able to get her last location. Before commercial production, by implementing the following features, the design of the developed prototype of the women safety ring can be improved.

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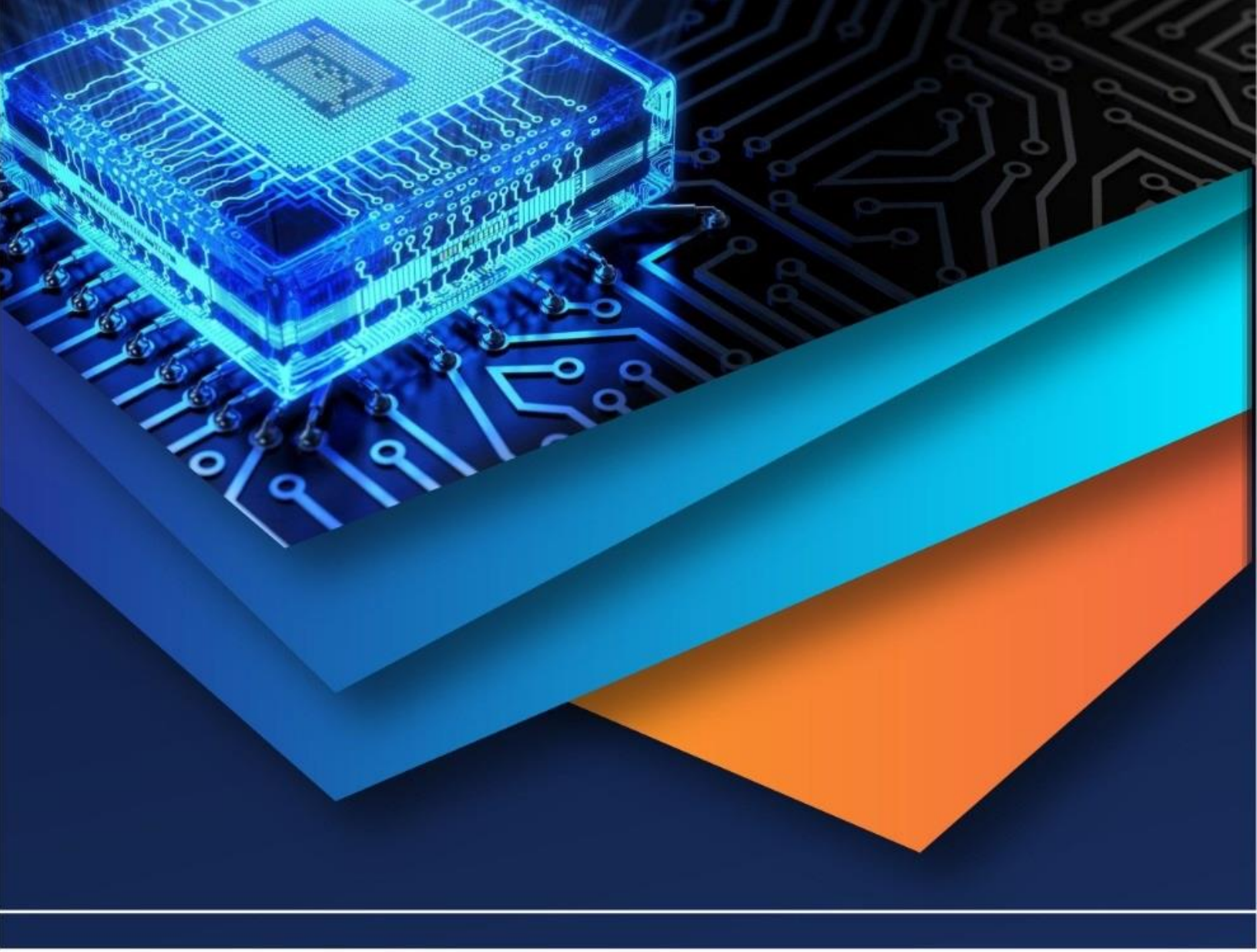

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