# IOT BASED SYSTEM FOR WOMEN SAFETY

**by**


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## APPROVAL AND DECLARATION

**This Project Report titled "IOT BASED SYSTEM FOR WOMEN SAFETY" was prepared and submitted by BALASUBRAMANIAM K R (71382002016), HARIHARAN K (71382002042), AKIL K (71382002301) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Computer Science and Engineering) in Sri Ramakrishna Institute of Technology, Coimbatore-10 (SRIT).**

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# BONAFIDE CERTIFICATE

**Certified that this Project Report "IOT BASED SYSTEM FOR WOMEN SAFETY" the bonafide work of "BALASUBRAMANIAM K R (71382002016), HARIHARAN K (71382002042), AKIL K (71382002301)" who carried out the project work under my supervision.**

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# ABSTRACT

The "IoT-Based System for Women Safety" project presents a clever solution to tackle the pressing issue of women's safety. By harnessing the power of the Internet of Things (IoT), this system offers real-time monitoring and assistance in potentially risky situations. It brings together a network of IoT devices, including small discreet wearables, mobile apps and strategically positioned sensors in public areas, ensuring women's security through seamless connectivity. The wearable devices are equipped with GPS, panic buttons and biometric sensors, enabling quick notifications to authorities and loved ones in emergencies. To empower users, a dedicated mobile app allows them to interact with the system, offering features like location tracking, access to emergency services and a supportive community network. In public spaces, special sensors are deployed to promptly detect any suspicious activities and alert the relevant authorities. The data collected from these devices is processed and securely stored in the cloud, facilitating continuous monitoring and analysis using advanced machine learning algorithms. Moreover, this system actively encourages community involvement by allowing users to share safety concerns, receive real-time alerts from nearby individuals and collaborate with local authorities and support networks. It establishes a dependable safety net by combining preventive and reactive measures, thereby bolstering women's security and fostering confidence, ultimately contributing to the creation of a safer society.

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# LIST OF ABBREVIATION

| | |
|---|---|
| GPS | Global Positioning System |
| IFTTT | If This Then That |
| IOT | Internet of things |
| DHT | Digital Temperature And Humidity |

# CHAPTER 1

# INTRODUCTION

In an era of unprecedented technological advancement, our society is grappling with the urgent challenge of ensuring the safety and protection of women. The pervasive problem of violence against women and the continued fear of harassment in public spaces requires innovative solutions that leverage cutting-edge technology. Join our project IoT-based system for women's safety. This is a groundbreaking initiative that leverages the transformative potential of the Internet of Things (IoT) to address pressing concerns surrounding women's safety.

The Internet of Things represents a paradigm shift in the way smart devices seamlessly communicate and collaborate, providing a unique opportunity to revolutionize approaches to tackling complex societal challenges. Our project leverages this technology to create a comprehensive security ecosystem that combines wearable technology, mobile applications and sensors strategically placed in public spaces. This connected system aims to provide women with real-time monitoring and immediate support, ultimately increasing their sense of security and security.

At the heart of our project is the recognition that ensuring women's safety is not just an individual responsibility, but a shared societal obligation. By harnessing the power of IoT technology, we aim to give women the tools and support they need to navigate the world with confidence, regardless of their environment or situation. This introduction sets the stage by highlighting the urgent need for innovative solutions for women's safety and well-being. This emphasizes that our efforts are a proactive response to the pressing challenges faced by women and highlights the importance and potential applications of the "Her IoT-based System for Women's Safety". provides important background for understanding.

## 1.1 OBJECTIVE:

The IoT-Based System for Women's Safety project has a primary goal of completely transforming safety measures for women. By utilizing the capabilities of Internet of Things (IoT) technology, this project aims to address the critical need for innovative safety solutions that specifically cater to women's requirements. It encompasses real-time monitoring, automated alert mechanisms and precise location tracking.

In essence, the project seeks to actively contribute to women's security in various environments, ultimately enhancing their safety. Real-time monitoring systems play a pivotal role in this mission by tracking vital signs like heart rate and temperature, providing women with immediate awareness of their physical well-being. Based on this real-time data, an automated alert mechanism is triggered in emergency situations, ensuring swift responses through predefined conditions like abnormal readings or manual activation.

One key element of this concept is the integration of GPS technology, which enables precise monitoring of a user's location during an emergency. This technology not only detects emergencies but also facilitates prompt and accurate reactions by automatically transmitting the information to the relevant authorities and designated contacts.User-friendliness is a crucial factor emphasized in this project to ensure an easy-to-use interface that promotes seamless interaction. Compatibility with mobile devices allows users to receive warnings, monitor their location and contact emergency services effortlessly, further enhancing accessibility.

Privacy and security are of utmost importance in this system, with robust measures in place to protect user data and ensure trustworthy operation. Additionally, through awareness campaigns, women are educated about the system's capabilities, promoting empowerment and encouraging widespread adoption to improve community safety.

Finally, the project is designed for continuous improvement and adaptability to lay the foundation for ongoing development. This approach allows for the integration of emerging technologies and user feedback, ensuring the system remains at the forefront of safety solutions and evolves in response to user needs and technological advancements.

## 1.2 PROBLEM STATEMENT:

The proposed extend looks for to address the determined challenge of guaranteeing the security and assurance of ladies and young ladies through an imaginative and viable arrangement. Whereas existing security apps and gadgets exist, depending exclusively on smartphones can posture impediments, as these gadgets may not continuously be inside quick reach amid crises. Recognizing this crevice, our extend points to present a new approach, leveraging the capabilities of the Web of Things (IoT) to upgrade women's security.

Our essential objective is to create a wearable gadget that serves as a proactive security net in real-time, moderating the imperatives related with smartphone-dependent arrangements. The center usefulness of this wearable gadget centers around a advanced sensor framework planned to identify possibly perilous circumstances. Within the occasion that a lady wearing the gadget experiences hurt, the sensor quickly recognizes the threat and triggers a distress signal. This flag, rather than depending on conventional GSM innovation, will utilize the IFTTT webhook benefit, guaranteeing an quick call for offer assistance through a combination of GPS and IFTTT.

This integration with the IFTTT webhook benefit gives a consistent and productive implies of transmitting trouble signals, tending to circumstances where getting to a smartphone may be unreasonable or risky. By consolidating the comfort and transportability of a wearable gadget with the capabilities of IoT, our venture points to offer ladies a solid security component, lifting the level of security and giving peace of intellect.

Recognizing the down to earth challenges confronted by ladies in their day by day lives, our inventive arrangement endeavors to bridge the security crevice. We point to contribute to a more secure and more secure environment for ladies and young ladies over different circumstances and settings. Through the utilize of IoT innovation and the IFTTT webhook benefit, we look for to make a strong security framework that upgrades the generally well-being of ladies, cultivating a sense of security and strengthening.

## 1.3 SCOPE OF THE PROJECT:

The scope of the proposed "IoT-Based Framework for Ladies Security" venture is comprehensive, pointing to address the restrictions of existing security arrangements and give an imaginative, technology-driven approach to upgrade the security of ladies and young ladies. The venture looks for to go past routine smartphone-dependent applications and gadgets by presenting a wearable gadget that leverages the Web of Things (IoT) for real-time checking and help.

The essential center of the extend is to create a wearable gadget prepared with a advanced sensor framework able of identifying possibly unsafe circumstances. This gadget acts as a proactive security net, tending to the commonsense challenges ladies may experience in their everyday lives, particularly amid crises. The center usefulness includes the fast acknowledgment of threat, activating an prompt trouble flag. In differentiate to conventional GSM innovation, the venture selects for an elective and effective arrangement by joining the IFTTT (In the event that This At that point That) webhook benefit, disposing of the require for ordinary informing frameworks.

The integration of IFTTT permits for a consistent and customizable communication channel, upgrading the speed and unwavering quality of trouble flag transmission. This guarantees that offer assistance can be summoned instantly and effectively, indeed in circumstances where getting to a smartphone may be unreasonable or risky. The scope expands to the improvement of a user-friendly versatile application that empowers interaction with the wearable gadget, giving highlights such as area following and get to to crisis administrations. Furthermore, the extend envisions a collaborative organize where clients can share security concerns, get real-time cautions from adjacent people and lock in with nearby specialists and bolster systems.

By combining the comfort and movability of the wearable gadget with the control of IoT innovation and the IFTTT webhook benefit, The extend yearns to form a strong security instrument. The overarching objective is to contribute to the foundation of a more secure and more secure environment for ladies and young ladies in different circumstances and settings. The scope expands past the innovative perspectives to envelop societal and community association, cultivating a sense of shared obligation in guaranteeing women's security.

## 1.4 APPLICATIONS:

The project “IoT-based systems for women's safety” introduces a transformative approach to address women's safety concerns in a variety of real-life situations. By leveraging the capabilities of the Internet of Things (IoT), the project's applications will expand to diverse contexts, providing tailored solutions to improve women's safety.

Smart City Integration: In the context of smart cities, IoT-based system integration becomes the foundation of urban security. Wearable devices equipped with advanced biometric sensors and GPS technology respond to the constant movements of women in busy urban environments. These devices communicate seamlessly with the broader smart city infrastructure, including surveillance systems and emergency services. Real-time monitoring ensures emergency signals are transmitted quickly to law enforcement, allowing for rapid response in dense urban areas. The synergy between wearables and smart city networks creates a comprehensive security network that significantly contributes to the safety of women in urban areas.

Public Transportation Safety: Women using public transportation, such as buses or trains, face special safety challenges. IoT-based systems address these concerns by providing a multi-faceted approach to security. Wearable devices worn by women during transport provide constant monitoring, ensuring their safety throughout the journey. Additionally, sensors placed strategically throughout transportation hubs will detect and scan the environment for any signs of potential danger. In the event of an emergency or suspicious activity, the system will automatically contact relevant authorities, facilitating immediate response to ensure women's safety when using public transportation.

Workplace Safety Solutions:In the workplace, workplace safety is extremely important. IoT-based systems are seamlessly integrated into the work environment to improve employee safety.

Wearable devices, equipped with panic buttons and discreet sensors, establish a direct communication channel with workplace security personnel. This ensures that women who work late or in remote areas of the workplace have a higher level of security. This system contributes to building existing workplace safety procedures, promoting a safe environment for women in many different fields.

Travel and Tourism Security: For women engaged in travel and exploration, IoT-based systems emerge as valuable security companions. Wearable devices with GPS capabilities continuously track the location of female travelers. In unusual or potentially risky situations, these devices allow women to send a distress signal, alerting local authorities or designated emergency contacts. This app model addresses the unique security needs of female travelers, providing an extra layer of security when traveling alone or in groups. This system actively contributes to helping women travel more safely and securely to various destinations.

Educational institutions and facilities: Security in educational institutions, especially on school and university campuses, is a primary concern. The IoT-based system is designed to address the specific security needs of women in these contexts. Wearable devices designed for students, faculty and staff include features such as panic buttons, which provide a direct and immediate communication channel with campus security. Additionally, sensors strategically placed on campus contribute to proactive monitoring, thereby ensuring a safer environment for women in educational institutions. This system improves overall campus security, giving women the confidence to navigate university spaces safely.

Community Safety Initiatives: IoT-based system drives community safety initiatives, allowing women to actively participate in creating safer neighborhoods. Wearable devices connect women in communities, facilitating real-time communication and support. Local sensors placed strategically in community spaces, parks and recreation areas help improve alert levels, providing an additional level of security. This system encourages collaboration between community members and law enforcement, ensuring a collective effort to create and maintain safer living environments for women.

## 1.5 EXISTING SYSTEM

In the area of women's safety, a number of existing IoT-based systems are making significant progress, leveraging connected devices and advanced technology to address safety concerns and exchange concerns. Rights for women in many different situations.

Smart jewelry and wearables: The market has seen the emergence of smart jewelry and wearables that incorporate IoT technology to specifically address security all of women. These devices are not merely decorations but also incorporate features such as emergency buttons, GPS tracking and mobile app connectivity. In the event of a crash, users can activate these devices to send an immediate alert and built-in GPS technology ensures real-time location information is transmitted to designated contacts or service providers. Emergency service. This not only helps women seek help discreetly, but is also a proactive measure to prevent potential threats.

Security apps for personal devices: Countless smartphone apps have been developed to address women's safety concerns, with seamless integration IoT capabilities. These safety apps offer a full range of features, including real-time location sharing, emergency contact alerts and virtual companion services. By leveraging IoT infrastructure, users can trigger a distress signal through their smartphone, initiating a series of responses that may involve contacting authorities or informing the public. Notify pre-selected emergency contacts. These apps aim to empower women by providing them with a digital safety net that is easily accessible through their personal devices.

Connected Public Safety Infrastructure: Forward-thinking cities are adopting the concept of connected public safety infrastructure to improve women's safety. This involves the strategic deployment of cameras, sensors and smart emergency warning systems in public spaces. Interconnected devices leverage IoT technology to monitor activities, detect potential threats and quickly notify law enforcement or emergency services. The system is designed to create a safer urban environment by facilitating rapid response to incidents, thereby contributing to a safer public space for women.

Smart home security system: In the field of personal security, IoT-based smart home security system plays a vital role in addressing concerns of women in their living space. These complete systems include connected cameras, motion sensors and door/window sensors. Through integration with mobile applications, users can monitor and control security features remotely. Not only does this improve the overall security of the home, but it also gives women a sense of control and assurance over their surroundings.

Community Safety Net: Some communities and neighborhoods have taken a proactive approach to ensuring women's safety by establishing safety nets based on IoT. Residents can use handheld devices or smartphone applications that connect seamlessly to the centralized security system. In the event of an emergency or detection of suspicious activity, users can quickly alert local authorities or contact other community members. This collaborative approach to safety promotes a sense of shared responsibility and community participation, creating an interconnected safety network that benefits women in their everyday lives.

Traffic Safety Solutions: In transportation, both the public and private sectors are integrating IoT technology to improve the safety of women traveling. Ride-sharing services and public transportation systems have integrated emergency buttons, real-time tracking and communication tools into their apps. These advances ensure that women can easily access help during their travels, promoting a safe and reliable transportation experience. Together these current IoT-based systems highlight the transformative potential of technology to address women's safety concerns. Each system, in its own way, contributes to creating a safer and more empowered environment for women, illustrating the multifaceted applications of IoT in safety and security.

## 1.6 PROPOSED SYSTEM

In response to the ever-present challenges surrounding women's safety, our project, the "IoT-Based System for Women Safety," aspires to introduce a groundbreaking solution that leverages the capabilities of the Internet of Things (IoT). The proposed system aims to redefine the landscape of women's safety by addressing the limitations of existing solutions and introducing a comprehensive, proactive and dynamic approach.

Wearable Device with Advanced Sensors: At the heart of our proposed system is the development of a sophisticated wearable device equipped with advanced sensors. These sensors surpass the conventional panic buttons by integrating cutting-edge biometric technology. This allows the wearable device to not only detect potential threats but also recognize patterns of behavior indicative of danger. The wearable becomes a versatile and intuitive safety tool, offering women a heightened sense of security through real-time monitoring and the immediate triggering of distress signals.

IoT-Integrated Mobile Application: Complementing the wearable device is an intricately designed IoT-integrated mobile application. This application serves as a centralized hub, empowering users to seamlessly connect and control the wearable device. Features include real-time location tracking, personalized settings for varying safety preferences and direct communication with a designated support network. The integration with IoT ensures efficient communication between the application and wearable device, providing a user-friendly interface and enhancing the overall user experience.

IFTTT Webhook Service for Efficient Communication: The proposed system introduces a departure from conventional GSM technology, opting for the IFTTT (If This Then That) webhook service for distress signal communication. This strategic shift allows for a more efficient, customizable and responsive communication channel. In emergency situations, the wearable device triggers the IFTTT service, which can be configured to notify relevant authorities, emergency contacts, or community support networks. This level of flexibility ensures that distress signals are transmitted swiftly and effectively, transcending the limitations associated with traditional messaging systems.

Strategically Positioned Sensors in Public Spaces: Expanding the safety network beyond personal devices, our proposed system envisions the deployment of strategically positioned sensors in public spaces. These IoT-enabled sensors actively monitor the surroundings, utilizing machine learning algorithms to detect any suspicious activities or potential threats. In the event of identified anomalies, the system can promptly alert relevant authorities, establishing a proactive safety infrastructure that contributes to the overall security of women in shared environments.

Cloud-Based Data Processing and Analysis: The proposed system adopts a cloud-based approach for data processing and analysis to efficiently manage the information generated by wearable devices and sensors. This cloud infrastructure facilitates continuous monitoring, real-time analysis and the application of advanced machine learning algorithms to identify patterns or trends in safety-related data. Beyond providing secure storage, the cloud-based system enables iterative improvements based on evolving safety needs, ensuring the adaptability and longevity of the proposed safety solution.

Community Engagement and Support Network: Beyond its technological components, our proposed system actively encourages community involvement as a foundational pillar. The accompanying mobile application facilitates user engagement, allowing individuals to share safety concerns, receive real-time alerts from nearby users and collaborate with local authorities and support networks. This community-centric approach establishes a sense of shared responsibility, fostering a collaborative effort to create safer environments for women. Moreover, the system provides a platform for community members to actively participate in safety initiatives, contributing to the development of a robust and inclusive safety network.

# CHAPTER 2

## LITERATURE REVIEW

**AnandJatti, et.al [2016].** This goal is achieved by analyzing physiological signals related to body position. The physiological signals analyzed are galvanic skin resistance and body temperature. Body position is determined by collecting raw accelerometer data from a 3-axis accelerometer. Raw data capture is followed by activity recognition using special machine learning algorithms. Real-time monitoring of data is achieved by wirelessly transmitting sensor data to an open-source cloud platform.Data is simultaneously analyzed in MATLAB. The device is programmed to continuously monitor the subject's parameters and take action in the event of a dangerous situation. This is done by detecting changes in monitored signals and taking appropriate action by sending notifications/alerts to specific people. Index Terms – Activity recognition, body temperature, galvanic skin resistance, Internet of Things, machine learning, WEKA.

**Debojyoti Seth et.al [2018].** Internet of Things (IOT)-based platforms provide dexterity and dynamism in coordinating various sensors and actuators to ensure women's safety. Hidden Markov Models (HMMs) offer opportunities for better predictive analysis due to their dynamic probabilistic nature and have helped develop dense detection approaches based on signatures of suspicious activity. Situational analysis for relative modeling based on facial recognition and ambiguous labeling of verbal conversations. When an emergency occurs, her GSM/GPS module will trigger the emergency if aftershocks occur, or alert the device wearer if not. The experimental results turned out to be very promising with an accuracy of 94.7%. Keywords – Internet of Things, Hidden Markov Model, Smart Woman Safety, GSM/GPS Module, Fuzzy.

**Dhiraj Sunehra et.al [2020].** In this article, we will introduce a smart security solution "smart wearable device system" using Raspberry Pi3 to improve the safety of women and children. It acts as both an alarm system and a security system. Sends a buzzer notification to people near the user (the person wearing the smart device). This is a system that uses the Global Positioning System (GPS). In order to determine the user's location, it uses Global System for Mobile Communications (GSM)/General Radio Packet Service (GPRS) technology to send the user's location via her SMS to emergency contacts and the police. The device also captures images of the attack and the user's or victim's surroundings using a USB webcam connected to the device and immediately after the user presses the panic button on his wearable smart device. Send the image as an email notification to your emergency contacts. Keywords – Raspberry Pi3, IoT, GPS, GSM, email notification.

**Prottasha Ghosh et.al [2021].** This paper focuses on a novel IoT-based evidence collection device to ensure women's safety. This system consists of a Raspberry Pi, a buzzer and a camera. Combination of flex sensor, GSM and GPS module. The compact size makes it easy and convenient for women to use in their underwear. Efficient and automatically working security device with Raspberry Pi, flex sensor to power on the device by human hand movement, buzzer for instant alarm, camera to capture the scenario, for location tracking and SMS sending her GPS and GSM module. Her IoT-based web server connection for preserving evidence is combined with women's underwear and can be activated immediately after pressure is applied to rescue women in unprotected locations and situations. I can. In this document, we used Raspberry Pi module and GSM module to send SMS to selected numbers and track the victim's location. The camera module and VR module were used for image or video streaming capture and voice recognition. A web server was developed where captured images, video and audio are stored. Therefore, if there is a problem with the evidence, this evidence is fine.

**Rahul Paknikar et.al [2019].** Women are still afraid to leave their homes late at night for fear of sexual harassment. This problem is further exacerbated when the focus shifts from the urban sector to the rural sector and hinterland of villages, where electricity supply is unreliable and connectivity to mobile networks is poor. Although there are many smartphone-based solutions, the availability of smartphones and mobile networks is unstable in rural areas. In this paper, we propose a system that utilizes IoT technology to build wearable devices and a wireless network to alert related authorities to prevent accidents. A women's safety solution based on the Internet of Things (IOT) A woman is given a beacon on her device consisting of a button for help. In the event of an emergency, information from the beacon will be sent to a central station, which will sound an alarm at a prominent location in the village. The victim's location can be determined based on proximity to the nearest access point. Index Terms – Bluetooth Low Energy, Global Positioning System, Beacon Device, Internet of Things, Solar Panels, Access Point, Central Station.

**R. Sakthi Prabha et.al [2018].** A device has been modeled that provides practical assistance to women at risk with the push of a button. The device uses Global Positioning System (GPS) to make it easy to locate women at risk. It also sends an alert message and phone call to the respective emergency contacts already stored in the microcontroller through Global System for Mobile Communications (GSM). Therefore, this device is useful for women who are outdoors when they feel unsafe in their surroundings. The advantage of this system is that it can determine the exact location (both longitude and latitude) of the person at risk.

**Sulochana Roy et.al [2020].** One of the main challenges in today's society is maintaining continuous contact with loved ones and providing continuous protective services, especially when women and children leave their homes to meet their daily needs. That's it. The goal of this project is to develop an IoT security device using a Raspberry Pi 3 microcontroller and two Android applications that will allow the main user to instantly notify the necessary personnel in an emergency. It is to do. When an emergency notification is sent to a primary user, such as a ward, the parent can use timestamps to track the primary user's current location. It can also be used to allow primary users to route emergency calls to their nearest emergency service provider, such as an ambulance, police, auto repair shop, or taxi service. This is done by mapping the locations of emergency service providers using a clustering algorithm. Additionally, the application helps collect relevant emergency data such as audio clips and images, stores links to them in the Firebase cloud and broadcasts them live via the Android application as soon as parents try to read the notification. The real-time data that Firebase continuously stores serves as a concrete, authoritative source of information that users can rely on in future criminal and other investigations.

Furthermore, the proposed system is built in such a way that both Android applications and IoT-based security devices can function independently, depending on WiFi availability. This reduces the chance of failure when using the security package in real-world scenarios. Keywords – Internet of Things. Raspberry Pi 3; Android; Clustering algorithm. Firebase cloud; fingerprint authentication. Nearest emergency service provider. Ambulance; Police; Auto repair shop. Taxi service; image or audio clip.  criminal or other investigations; real-time data.

**Tamilbharathi et.al [2021].** In a world where technology and safety are paramount, ensuring the security of women has become a critical concern, not only in India but globally. Handling cases of women's safety, particularly police response to distress calls, poses various challenges, including difficulties in locating and reaching the crime scene discreetly. This has led to a troubling increase in crimes against women and children. To address these issues, governments have introduced regulations to enhance women's safety. While existing safety systems have been developed, they often have limitations in providing immediate assistance, relying on physical mechanisms like buttons and buzzers. To overcome these challenges, this paper proposes a solution using sensors, GPS/GSM technology, a smartphone application and a smart band with Bluetooth Low Energy (BLE). These tools aim to provide real-time support to women in distressing situations, offering a more effective and efficient approach to enhancing women's safety.

**N.L. Vamsi Priya.K et.al [2018].** This project aims to give security to women. In the event of an emergency, when a woman presses the emergency button, GPS is activated to track her location and send an SMS with the time to the police and her family. This proposal document describes a rapid response cost protection system for individuals, particularly women. This allows a woman in trouble to call for help by touching a button on this smart her device. Women wear this device as a watch or bracelet. In case of harassment, or if the woman senses that someone is trying to harass her, she presses a switch  on her watch or bracelet. Or, when a woman receives information about an attack, her location information is sent as an SMS notification to her pre-configured emergency number. Number sent. Help will soon arrive and inform the police of the victim's location, allowing them to prevent further incidents.

**K. Venkatesh et.al [2021].** A wearable "bracelet" that constantly communicates with smartphones, which are becoming increasingly connected to the Internet. This article will give you a clear insight into the placement and usage of the bracelet. The device includes a trigger, microcontroller (ATmega2560), GSM module (SIM800) (subscriber identity module), GPS module (Neo-6M), IoT module (ESP-12E), neurostimulator, buzzer and vibration. It contains. Sensor included. If the woman feels unsafe during this task, she must keep the trigger of the device closed. Once the device is authenticated, it uses GPS (Global Positioning System) to track the river area, sends an emergency message to a registered adaptation number via GSM (Global Mobile Communications System) and locates the station building. Shut down. The IoT area is used to intelligently track the world and provide information to the net tab. In a crisis situation, the neurostimulator administers non-lethal electrical anesthesia to isolate the attacker. The signal is used as an alarm to let those around you know that someone is stuck between a rock and a hard surface and the vibration sensor sends the prop to a safe location if the device is stolen. The general idea of this venture is that this device will be distributed everywhere as if it were nothing.

# CHAPTER 3

# REQUIREMENT SPECIFICATION

## 3.1 SOFTWARE REQUIREMENTS:

- Operating System - Windows 10 or higher version
- Programming Language - C++
- Simulator Tool - Arduino IDE
- Automation - IFTTT

## 3.2 HARDWARE REQUIREMENTS:

NodeMCU(ESP8266):

The NodeMCU(ESP8266) is selected as the microcontroller development board for its robust features and compatibility with IoT applications. It comes equipped with Wi-Fi connectivity, facilitating seamless data transmission over the internet. This microcontroller plays a pivotal role in executing the firmware and ensuring the proper functioning of the wearable device.

Push Button:

The inclusion of a push button is imperative for user interaction within the IoT system. This hardware component enables users to activate specific functionalities or establish connections by pressing the button. Its role in the wearable device provides a tangible and user-friendly interface for initiating distress signals promptly.

GPS Receiver:

A GPS receiver is integrated into the hardware to enable real-time location tracking. This component is essential for enhancing the safety features of the system, allowing accurate positioning of the user. The IoT system utilizes this data to transmit location information in distress situations, contributing to efficient emergency responses.

Temperature Sensor:

The inclusion of a temperature sensor adds versatility to the system's capabilities. This hardware component offers real-time temperature readings, generating an output signal proportional to the measured temperature. This data can be utilized to trigger responses or regulate the system based on temperature variations, enhancing the system's adaptability.

Pulse Rate Sensor:

A pulse rate sensor is integrated to measure heart rate, employing photoplethysmography (PPG) technology. This non-digital instrument detects variations in blood volume, providing crucial health-related data. The sensor contributes to the overall functionality of the wearable device, ensuring it addresses both safety and health monitoring aspects.

LCD:

The incorporation of a Liquid Crystal Display (LCD) serves as a visual interface for the IoT system. LCD screens are utilized to display real-time data and provide a user-friendly interface for controlling the wearable device. This component enhances user interaction and ensures that relevant information is easily accessible to the user.

Accelerometer Sensor:

An accelerometer sensor is included to measure acceleration and detect the speed of movement. This hardware component is crucial for tasks such as step counting, orientation detection and monitoring vibrations. In the context of the IoT-based safety system, the accelerometer enhances the system's capabilities for movement-related functionalities.

## CHAPTER 4

## SYSTEM SPECIFICATION

### 4.1 BLOCK DIAGRAM:

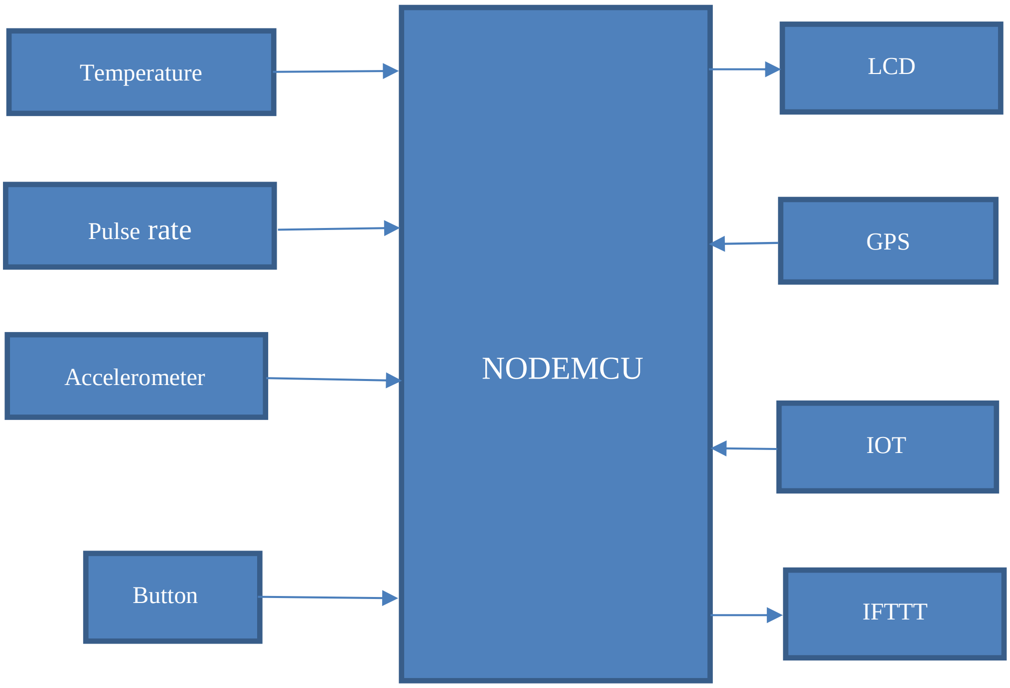


**Figure 4.1: Block diagram of the device**

The above figure 4.1 shows the detailed block diagram of “Secure IoT Based System ensuring security for women”, illustrating the connection with each other. Components designed to ensure women's safety with real-time monitoring and feedback features.

At the heart of the system is the NodeMCU (ESP8266), a powerful microcontroller that serves as the central processor. This component plays a central role in running the firmware and supporting communication between the various hardware components of the wearable device.

A key feature highlighted in the block diagram is the GPS receiver, which provides accurate real-time location tracking. This feature improves system responsiveness in emergency situations by transmitting precise geographic coordinates for immediate assistance.

Equipping a temperature sensor adds a health monitoring aspect to the system, allowing for environmental temperature measurements. This data contributes to the system's adaptability, allowing it to react to temperature changes and ensure the health of the user.

Heart rate sensor, using photoplethysmography (PPG) technology, provides important health-related metrics by measuring the user's heart rate. This information is important for both health monitoring and emergency response because it provides valuable data for assessing the user's health.

Additionally, the accelerometer measures acceleration and detects movement speed. This function is essential for tasks such as step counting, direction detection and vibration monitoring, significantly improving system capabilities.

User interaction is facilitated by the integration of a push button, which serves as a visible interface to activate the distress signal. When pressed, the push button launches specific features or makes a connection, ensuring an immediate, user-friendly response in an emergency.

Liquid crystal display (LCD) provides an intuitive interface, displaying real-time data and system response. This component improves user engagement by providing a clear and accessible way to track information.

System connectivity is supported by the broader IoT infrastructure, which represents the network that enables communication between wearable devices and external services. Finally, integrating the IFTTT (If This Then That) platform automates responses to trigger events, thereby optimizing communication efficiency within the system.

Each element in the diagram plays a distinct role, contributing to the overall functionality and effectiveness of “IoT Based System for Women Safety”. The following sections will provide detailed specifications, ensuring a complete understanding of the role and importance of each component in the system architecture.

## 4.2 SYSTEM DESIGN :

The “IoT-based system for women's safety” system design includes complex device connections and meticulous construction processes to ensure robust and effective implementation. This section examines the connectivity and construction of the major components depicted in the system block diagram.

The NodeMCU (ESP8266), serves as the central hub, establishing connections with various hardware components to coordinate seamless communication within the mobile device. Through GPIO pins and serial communication, the NodeMCU communicates with the GPS receiver, collecting location data in real time. This information is vital for system response in an emergency, facilitating precise geographic coordinates for immediate assistance.

Device connections extend to temperature sensors, heart rate sensors and accelerometers. NodeMCU communicates with these sensors to collect health-related metrics and movement data. For example, temperature sensors provide ambient temperature readings, contributing to improved system adaptability. The heart rate sensor uses PPG technology, allowing the system to monitor the user's heart rate for both health monitoring and emergency response. At the same time, the accelerometer measures acceleration, improving the system's ability to count steps, detect direction and monitor vibration.

The user interface component, the push button, is tightly coupled to the NodeMCU, providing a tangible means to activate the distress signal. The integrated process ensures that push buttons respond quickly and trigger immediate actions, ensuring a user-friendly response in the event of an emergency.

Liquid crystal display (LCD) integration involves connecting it to the NodeMCU to display real-time data and user feedback. Through a serial connection, the NodeMCU controls the information displayed on the LCD screen, providing users with important feedback and updates. IoT infrastructure operates as a global network, facilitating communication between wearable devices and external services.

This connectivity is critical for transmitting data to the cloud for analysis and storage, enabling real-time monitoring and use of advanced features. The build process includes careful assembly of these hardware components, ensuring proper connectivity, power and firmware integration. The system design prioritizes user-centricity and relies on a seamless integration of components to create dependable IoT-based systems that are both secure and responsive, specifically tailored for women.

The following sections will delve deeper into the specifications of each component, providing a comprehensive understanding of their role and contribution to the overall system architecture.

# CHAPTER 5

# METHODOLOGY

## 5.1 MANUAL MECHANISM:

The manual mechanism of the "IoT-Based System for Women Safety" is a user-centric approach that provides individuals with direct control over their safety. This mechanism serves as a fundamental component, allowing users to activate the system through a simple yet crucial button press. The following detailed explanation outlines the step-by-step process and functionalities embedded in the manual mechanism, as illustrated by the flow chart diagram in Figure 5.1.

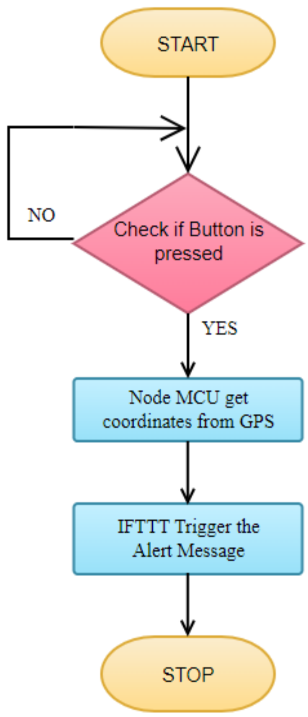


**Figure 5.1: Flowchart for Manual Mechanism**

## Activation through a Button Press

The process commences with the user initiating the system through a manual button press. This activation step is designed to be intuitive and easily accessible, acknowledging that in emergency situations, users may need a quick and straightforward method to signal distress. The user interface component for this activation is a push button strategically placed on the wearable device.

## NodeMCU Activation

Upon the button press, the NodeMCU (ESP8266) takes center stage in orchestrating the system's response. Serving as the central processing unit, the NodeMCU processes the activation signal and initializes the coordinated response of the wearable device. This involves activating various sensors and components crucial for collecting and transmitting data.

## Coordinated Response - Acquiring Precise Coordinates

A distinctive feature of the manual mechanism is the coordinated response aimed at acquiring precise location coordinates. The GPS receiver, once activated by the NodeMCU, starts the process of determining the user's exact location. This step is pivotal for providing accurate information to emergency responders, enabling them to locate the user swiftly and effectively.

## Alerting Emergency Contacts

With precise coordinates secured, the system proceeds to the next stage: alerting predefined emergency contacts. Leveraging the IoT infrastructure, distress signals are sent out to specified contacts, ensuring that the user's trusted network is immediately informed of the emergency. This communication aims to minimize response time, increasing the chances of timely assistance.

## Seeking Timely Assistance

The final stage of the manual mechanism involves seeking timely assistance from the alerted emergency contacts. Equipped with the user's location details, emergency responders can swiftly respond and provide aid. This manual approach empowers users to take control of their safety, ensuring a proactive and coordinated response to potential threats.

In summary, the manual mechanism is a user-activated process that prioritizes simplicity and immediacy. By incorporating a button press initiation, users can swiftly engage the system, prompting a coordinated response that includes acquiring precise location coordinates and alerting emergency contacts. This user-centric approach is designed to empower individuals, allowing them to play an active role in their safety.

This mechanism's simplicity is intentional, recognizing that during emergencies, individuals may not have the time or capacity for complex procedures. The subsequent sections will delve into the automated and alert mechanisms, providing a comprehensive understanding of how each component contributes to the overall safety architecture of the system.

## 5.2 AUTOMATED MECHANISM:

The automated mechanism within the "IoT-Based System for Women Safety" introduces a proactive layer of security, continuously monitoring the user's well-being. This sophisticated mechanism utilizes a combination of advanced sensors and an intelligent system, as outlined in the flow chart diagram in Figure 5.2. The detailed explanation below provides insights into the functionalities and processes embedded in the automated mechanism.

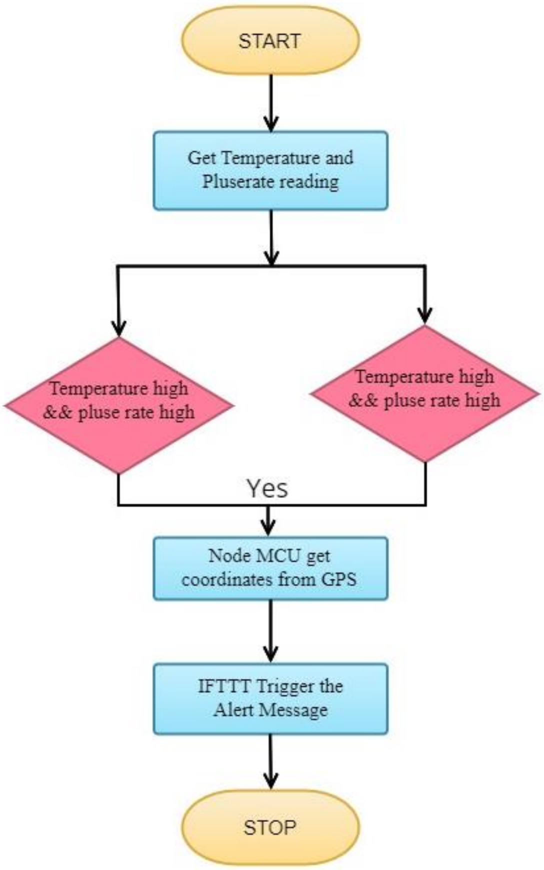


**Figure 5.2: Flowchart for Automatic mechanism**

Understanding the Automated Mechanism

At the core of the automated mechanism is an intelligent system designed to proactively monitor the user's health and safety. The flow chart diagram (Figure 5.2) illustrates the intricate steps involved in this automated process, emphasizing the continuous surveillance provided by the integration of three crucial sensors: the pulse-rate sensor, temperature sensor (DHT11) and accelerometer sensor (ADXL345).

The Brain Behind the Operation

The automated mechanism begins with the activation of the intelligent system, often referred to as the "brain" behind the operation. This system continuously processes data from the integrated sensors to assess the user's physical state. By employing sophisticated algorithms, the intelligent system can identify anomalies or potential threats to the user's well-being.

Pulse-Rate Sensor: A Heartbeat Guardian

One key component of the automated mechanism is the pulse-rate sensor, acting as a "heartbeat guardian." Employing photoplethysmography (PPG) technology, this sensor monitors the user's heart rate in real-time. Any abnormal fluctuations, indicative of distress or health issues, trigger the system to initiate the distress signal process. This real-time monitoring adds an extra layer of security beyond manual intervention.

Temperature Sensor (DHT11): A Temperature Watcher

The integration of the temperature sensor (DHT11) introduces a health monitoring dimension to the system. This sensor continuously measures the ambient temperature, allowing the system to detect unusual temperature variations. Such variations can signal potential health risks or emergency situations, enhancing the system's reliability and adaptability.

Accelerometer Sensor (ADXL345): A Motion Detector

The accelerometer sensor, functioning as a "motion detector," measures acceleration and detects movement patterns. This sensor is crucial for identifying sudden movements or changes in user activity. When abnormal motion patterns are detected, the system's automated response is triggered, ensuring a swift reaction to potential threats.

Enhanced Reliability: The Power of Three Sensors

The synergy between the three sensors—pulse-rate, temperature and accelerometer—enhances the overall reliability of the automated mechanism. By combining data from these sensors, the system achieves a comprehensive understanding of the user's physical state. This holistic approach ensures more accurate threat detection and response, contributing to the system's effectiveness.

Empowering Security: A Safety Net Beyond Manual Intervention

The automated mechanism functions as a proactive safety net, providing continuous monitoring and swift responses to potential threats. By integrating advanced sensors and an intelligent system, the mechanism goes beyond relying solely on user-initiated distress signals. This creates a robust and intelligent safety solution that empowers women to navigate their surroundings confidently.

In essence, the automated mechanism leverages cutting-edge sensor technologies and an intelligent system to proactively monitor the user's health and safety. The integration of the pulse-rate, temperature and accelerometer sensors ensures a comprehensive approach to threat detection, establishing a safety net beyond manual intervention. The subsequent sections will delve into the alert mechanism, providing further insights into how the system efficiently dispatches vital information to ensure timely and automated assistance.

## 5.1 ALERT MECHANISM:

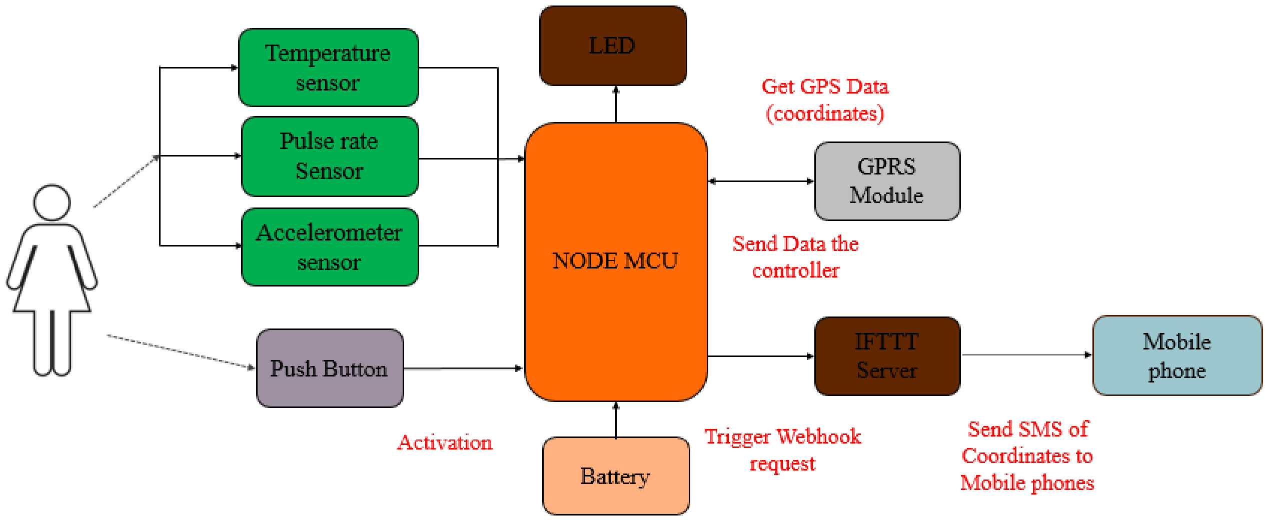


**Figure 5.3: System Architecture of Alert mechanism**

The alert mechanism in the "IoT-Based System for Women Safety" is a crucial component designed to efficiently dispatch vital information to relevant authorities and emergency contacts. Illustrated by the system architecture in Figure 5.3, this mechanism integrates various components to ensure timely and automated assistance. The comprehensive explanation below delves into the intricacies of the alert mechanism, highlighting its functionalities and the processes involved.

Understanding the Alert Mechanism

The alert mechanism is a pivotal aspect of the system, orchestrating the efficient dispatch of crucial information during emergency situations. The system architecture (Figure 5.3) illustrates the interconnected components and their roles in ensuring a rapid and effective response.

GPS Module: A Digital Pathfinder

Central to the alert mechanism is the GPS module, acting as a "digital pathfinder." This module continuously tracks the user's location, providing real-time coordinates crucial for emergency responders. The precise GPS data forms the foundation of the alert mechanism's efficiency, ensuring accurate location information is available when needed.

Bridging the Interpretation Gap: Google Maps Link

To bridge the interpretation gap and provide a user-friendly interface for emergency responders, the system generates a Google Maps link based on the GPS coordinates. This link simplifies the process for authorities to visualize the user's location accurately, ensuring a quick and informed response. The integration of Google Maps enhances communication by providing a familiar and accessible means of interpreting location data.

Dispatching Vital Information: IFTTT Webhooks

The alert mechanism leverages IFTTT (If This Then That) webhooks for efficient communication and the dispatch of vital information. IFTTT serves as a bridge between the system and external services, allowing seamless integration with third-party platforms and enabling the automated dispatch of information to predefined contacts and emergency services.

Efficient and Automated Assistance: A Digital Lifesaver

The culmination of the alert mechanism results in efficient and automated assistance. Emergency responders, armed with real-time location data and relevant information, can swiftly and accurately provide assistance to the user in distress. This digital lifesaver aspect ensures that the system not only detects threats but actively contributes to the user's safety by facilitating a rapid and informed response.

Empowering Safety: Beyond Technology

The alert mechanism goes beyond the confines of technology to empower safety. By integrating digital pathways, user-friendly interfaces and automated communication channels, the system ensures that assistance is not only swift but also effective. This comprehensive approach contributes to empowering the safety and well-being of women in diverse scenarios.

In essence, the alert mechanism is a sophisticated system that efficiently dispatches vital information during emergencies. By leveraging the GPS module for accurate location tracking, generating user-friendly Google Maps links and utilizing IFTTT webhooks for seamless communication, the mechanism ensures that emergency responders receive timely and comprehensive information. This level of automation and integration goes beyond conventional safety measures, providing a digital lifesaver that empowers women with effective and rapid assistance in critical situations.

The subsequent sections will delve into the implementation and testing processes, offering a detailed view of how each mechanism is realized in the actual system.

## CHAPTER 6

## RESULT AND ANALYSIS

### 6.1. RESULT:

Regarding our hardware project that we have developed, Figures 6.1 and 6.2 provide a glimpse of the concrete results that have been obtained using both the Manual and Automation mechanisms. These illustrations show how our system presents important data and initiates the alert mechanism in reaction to particular stimuli.

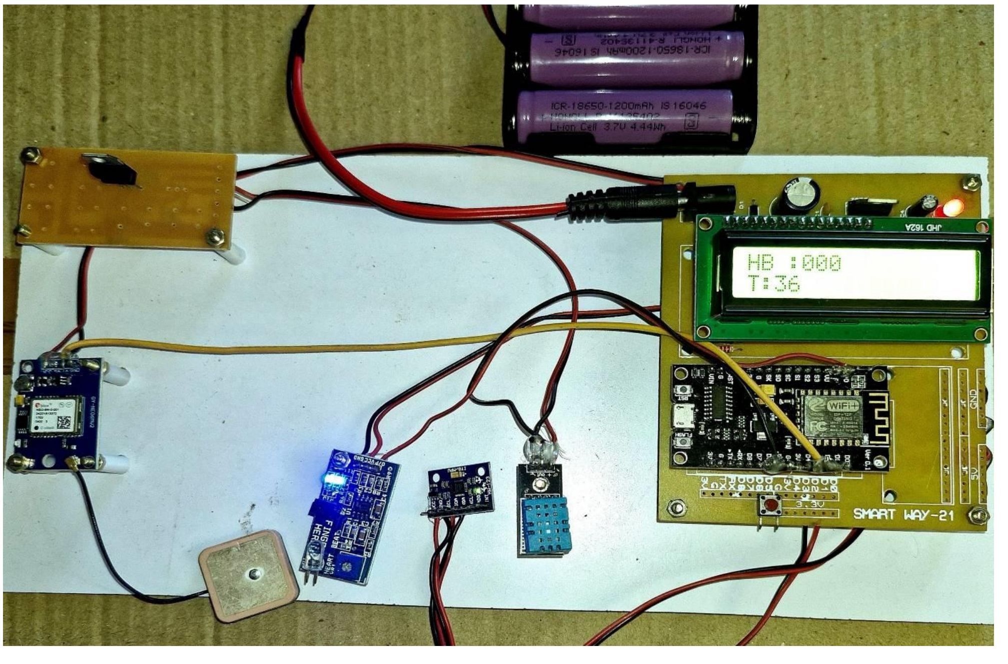


**Figure 6.1: Heartbeat and Temperature Display**

Figure 6.1 showcases the visual representation of heartbeat and temperature data displayed on the device. The integration of sensors, specifically the pulse-rate sensor and temperature sensor, is crucial for real-time health monitoring. The display provides users with immediate feedback on their vital signs, enhancing awareness and contributing to overall well-being. This figure not only demonstrates the functionality of the sensors but also highlights the user-friendly interface designed to present complex health data in an accessible manner.

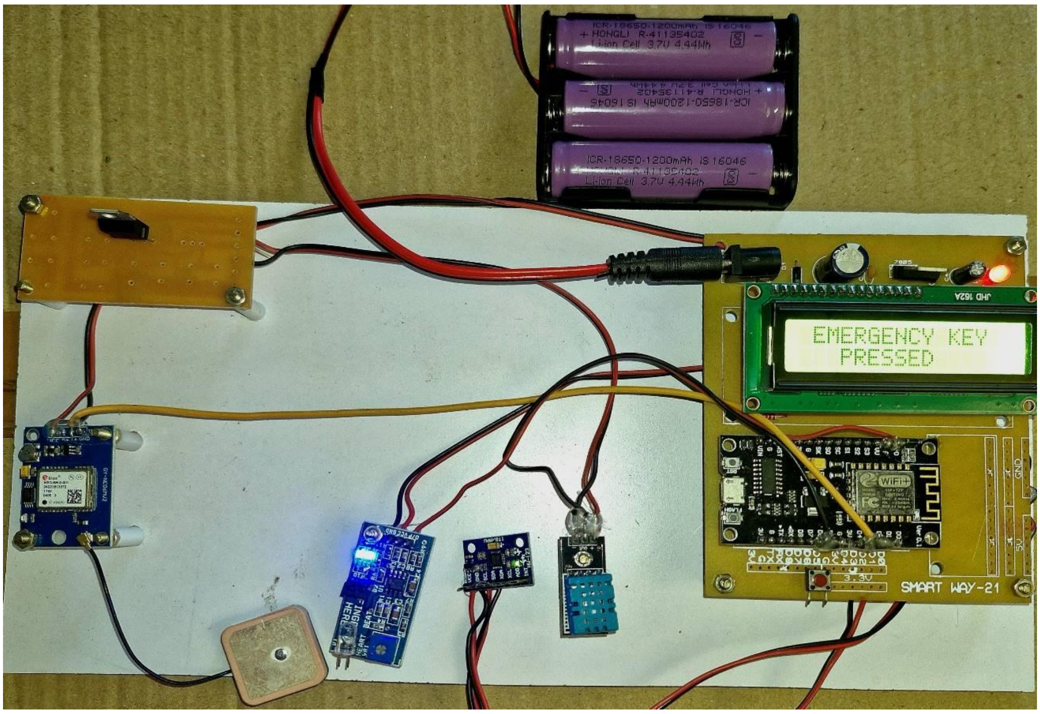


**Figure 6.2: Activation of Alert Mechanism**

Figure 6.2 captures the pivotal moment of activating the alert mechanism. This screenshot showcases the intuitive activation process initiated by the user, emphasizing the simplicity and immediacy of the manual mechanism. The activation triggers a coordinated response, setting in motion the system's ability to acquire precise location coordinates and alert emergency contacts. This figure serves as a visual testament to the user-centric design, ensuring that users can swiftly engage the safety features in times of distress.

### IFTTT Webhook in Action

In Figure 6.3, the action of the IFTTT webhook is vividly depicted. This step involves the seamless communication between the system and external services through IFTTT. The screenshot illustrates the triggering of an alert message by IFTTT, showcasing the efficient dispatch of vital information to predefined contacts. This figure emphasizes the role of IFTTT in automating the communication process, ensuring that relevant parties are promptly informed during emergencies.

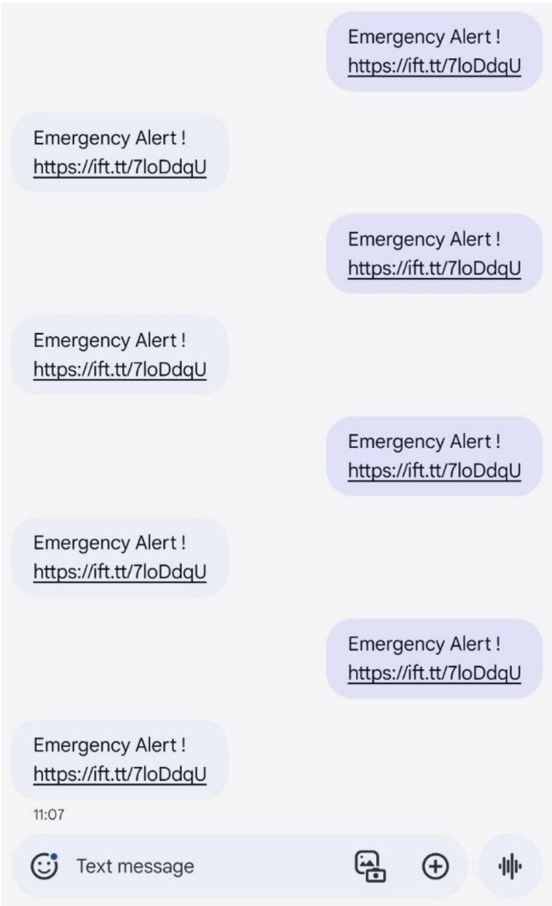


**Figure 6.3: Alert Message Triggered by IFTTT**

#### Clickable Link Outcome

Figure 6.4 delves into the outcome of the generated Google Maps link based on the GPS coordinates. The screenshot illustrates the clickable link, emphasizing its user-friendly nature. When opened in a browser, users and emergency responders can access precise location coordinates, bridging the interpretation gap and facilitating quick responses. This figure underscores the effectiveness of the alert mechanism in providing accurate and accessible information to relevant authorities.


**Figure 6.4: Location Coordinates Link in Browser**

**Map Representation of Device Location**

The final figure, Figure 6.5, offers a map representation of the device location and showcases the real-time location tracking in Google Maps. This visual representation highlights the system's capability to provide accurate and continuous updates on the user's location. The map display serves as a powerful tool for emergency responders, enabling them to navigate and reach the user swiftly. This figure reinforces the practical application of the system in enhancing user safety through advanced location tracking.

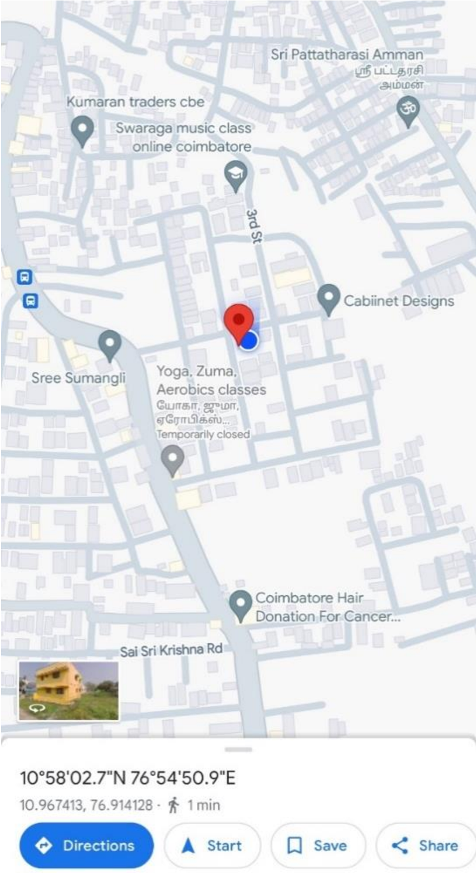


**Figure 6.5: Location Tracking in Google Map**

In summary, the results presented in Figures 6.1 to 6.5 underscore the successful implementation and functionality of the developed IoT-based women's safety system. These visuals provide a comprehensive view of the device's capabilities, the activation process, the automated communication through IFTTT and the practical outcomes of the alert mechanism, including clickable links and real-time location tracking. The subsequent sections will delve into a detailed analysis of the results, addressing the system's effectiveness, user experience and potential areas for improvement.

**In Simple Terms:**

In simpler terms, our project goes beyond hardware and sensors; it's about creating a safety companion that communicates with users in a language they understand. The LCD screen translates heartbeat and temperature into easily digestible information. The "Emergency key pressed" message signifies a powerful tool in the user's hands – a quick and effective way to call for help.

The clickable link within the alert message acts as a magic portal, seamlessly connecting the digital world to real-world coordinates. It's like a digital breadcrumb trail leading authorities to the exact spot where help is needed. Clicking the link is not just a click; it's a lifeline.

And finally, the map representation adds a visual layer to the story. It's like a superhero's map, showing the exact position and direction of the user. In emergencies, every second counts and this map ensures that help arrives at the right spot, right on time.

In conclusion, these results signify more than just technical success; they represent a journey toward a safer, more connected world. Our project is not just about devices; it's about empowerment, bridging the gap between technology and everyday life, ensuring that safety is accessible, understandable and above all, effective.

## 6.2. TOOLS USED :

**IoT Devices:** The project utilizes a range of IoT devices and sensors, with One essential IoT component is the NodeMCU ESP8266 Figure 6.4. It's a compact, multipurpose board with integrated WiFi. It processes data, used as microcontroller in our device to establishes connections with sensors and exchanges messages with other devices and the internet.

**Figure 6.6: NodeMCU(ESP8266)**

The DHT11 sensor Figure 6.5 in IoT measures temperature and humidity. It collects data, processes it and interfaces with a microcontroller. The microcontroller then reads the data, converts it into readable values and communicates this information to IoT platforms via Wi-Fi or other protocols.

**Figure 6.7: DHT11 Pulse-rate Sensor**

An NTC thermistor Figure 6.6 is a temperature sensor that changes its electrical resistance with temperature. In IoT applications, it's used in a measurement circuit to monitor temperature. The IoT device reads the voltage across the thermistor, converts it into a temperature reading and transmits this data wirelessly. The central system analyzes the temperature data and triggers actions as sending alerts. It's a crucial component in IoT systems for temperature monitoring and control.

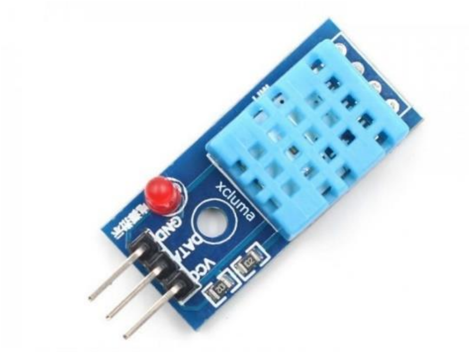


**Figure 6.8:NTC Thermistor temperature sensor**

Accelerometer Sensor(ADXl345) Figure 6.9 shows the accelerometer (ADXL345), a key component of an IoT-based women's safety system. This sensor measures acceleration, providing insight into the device's movement patterns. The ADXL345 plays a central role in detecting movements or sudden changes in user activity, serving as a motion sensor to trigger automatic responses. Its integration improves system reliability by contributing to a comprehensive understanding of the user's physical state, ensuring a proactive approach to potential threats in real time.

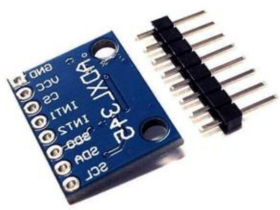


**Figure 6.9: Accelerometer Sensor sensor**

In Figure 6.10, an LCD screen (16x2) is shown, which serves as an important interface in an IoT-based women's safety system. The 16x2 LCD display provides clear and concise visual presentation of real-time data, such as heart rate and temperature readings. Its two rows and sixteen columns allow for transparent presentation of information, thereby enhancing user awareness. The LCD display acts as a user-friendly display, ensuring that individuals can easily interpret important health data and system status, contributing to an effective and efficient security solution.

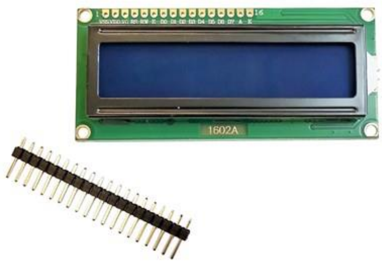


**Figure 6.10: LCD(16x2)**

GPS (Global Positioning System) the NEO-6M GPS module Figure 6.7 receiving signals from satellites to determine precise location coordinates, including latitude and longitude. This data is then transmitted to an IoT device, like an Arduino or Raspberry Pi, through serial communication. The device can process and use this location data for various purposes, such as real-time tracking, geofencing, or automation. It's a core component for gathering and integrating location information into IoT applications.

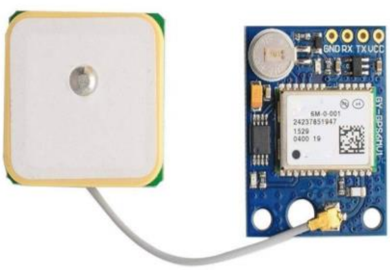


**Figure 6.11:NEO 6M GPS**

IFTTT (If This Then That) Figure 6.8 shows IFTTT is a web-based service designed to create applets that trigger specific actions based on predefined conditions. In this project, IFTTT plays a central role in sending alert messages and coordinating responses. It acts as the bridge that connects the IoT devices to mobile devices, ensuring rapid communication of alerts and location information.

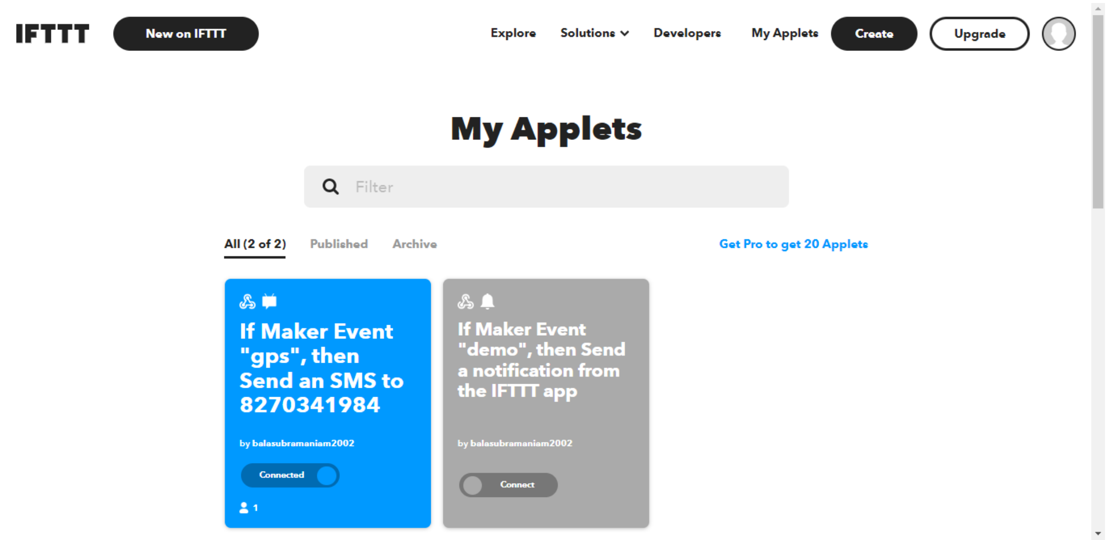


**Figure 6.12:IFTTT Webhook Applets**

Map Services Figure 6.9 displays Map services, are used to visualize and display location coordinates and provide directions. The coordinates are received in the clickable link by the IFTTT webhook service.

**Figure 6.13:Google Map**

Mobile Devices Mobile devices, primarily smartphones, are critical components for end-users. They serve as the primary interface for receiving and viewing alert messages, coordinates and location maps. These devices empower users by providing real-time information and allowing them to interact with the safety system, ensuring their safety and security.

Software Development Tools Arduino Ide tools and kits are essential for configuring IoT devices and sensors.

**Figure 6.14:Arduino IDE**

# CHAPTER 7

# CONCLUSION

## 8.1 SUMMARY:

“IoT-based system for women's safety” is a pioneering solution in the ongoing research to ensure the safety and well-being of women. This project combines cutting-edge technologies, such as wearables, advanced sensors and the Internet of Things (IoT), to create a comprehensive security ecosystem. The integration of manual, automated and alerting mechanisms addresses the multifaceted challenges women may face, providing real-time monitoring, proactive and reactive threat detection quickly in emergency situations. The specific results presented in Figures 6.1 to 6.5 highlight the system's success in providing practical and effective safety measures for women in a variety of situations.

The manual mechanism allows users to control their safety at the press of a button, highlighting the importance of user-centered design in emergency situations. The automated mechanism, with its intelligent sensor system, adds an additional layer of continuous health monitoring, ensuring a proactive approach to potential threats. The alert mechanism, powered by IFTTT webhooks, streamlines communication with emergency contacts and agencies, providing a quick and informed response. Collectively, these mechanisms create a safety net that promotes women's confidence and autonomy, recognizing their diverse needs and challenges in different environments.

This project goes beyond conventional security measures by not only addressing immediate security concerns but also promoting a sense of safety and empowerment. By leveraging technology to fill the gaps in traditional security solutions, this system helps create safer, more inclusive communities.

## 8.2 FUTURE WORK:

The success of the current system paves the way for future improvements and expansions that could further increase its impact. Integrating artificial intelligence (AI) algorithms appears to be a promising avenue to improve the system's analytical capabilities. AI can contribute to more nuanced threat detection by identifying patterns and anomalies in user data, improving the accuracy of the entire system. Additionally, integrating voice recognition technology can provide an alternative means of activation, especially beneficial in situations where manual interaction may be difficult or dangerous.

Exploring partnerships with law enforcement and local government is another important avenue for future work. Collaborating with these entities can streamline the emergency coordination process, ensuring a more effective and informed response. This collaborative approach can foster stronger connections between systems and the broader security infrastructure, contributing to a more cohesive and responsive ecosystem.

Continuous user feedback and iterative improvements will be paramount to ensure the system remains adaptable to evolving security needs. Regular firmware and system software updates can introduce new features, address emerging security issues and improve the overall user experience. Iterative development should prioritize user participation and interaction, actively seeking feedback from the diverse communities the system aims to serve.

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# APPENDICES

## A.SOURCE CODE

```
#include <Adafruit_MPU6050.h>

Adafruit_MPU6050 mpu;
Adafruit_Sensor *mpu_temp, *mpu_accel, *mpu_gyro;

#include <EveryTimer.h>
#define PERIOD_MS 1000

EveryTimer timer;
bool active = true;

#include <LCD_I2C.h>
LCD_I2C lcd(0x27);

#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

#include "DHT.h"
#define DHTPIN D5
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);

#define BLYNK_TEMPLATE_ID "TMPL3mjeMgPXw"
#define BLYNK_TEMPLATE_NAME "GPS TRACKING"
```

```
#define BLYNK_AUTH_TOKEN "dCSS3KVOy7KJ5-UlkA2hgYlpG3lwFuzV"
char auth[] = BLYNK_AUTH_TOKEN;

const char* ssid     = "IOT";
const char* password = "123456789";
const char* host = "maker.ifttt.com";

const int PulseWire = A0;
unsigned int myBPM,bpm ,p,X,sec,count;
int t,h;

#include <TinyGPS++.h>
#include <SoftwareSerial.h>


SoftwareSerial GPS_SoftSerial(D3, D4);/* (Rx, Tx) */
TinyGPSPlus gps;

volatile float minutes, seconds;
volatile int degree, secs, mins;
float latn,longn;


    double lat_val, lng_val, alt_m_val;
    uint8_t hr_val, min_val, sec_val;
    bool loc_valid, alt_valid, time_valid;

#define btn D6
String s = "www.google.com/maps/dir/";

void setup()
{
```

```
  Serial.begin(9600);
  pinMode(btn,INPUT_PULLUP);
  lcd.begin(); // If you are using more I2C devices using the Wire library use lcd.begin(false)
               // this stop the library(LCD_I2C) from calling Wire.begin()
  lcd.backlight();
   dht.begin();
  pinMode(PulseWire,INPUT);
  Blynk.begin(auth, ssid, password, "blynk.cloud", 80);
  GPS_SoftSerial.begin(9600); /* Define baud rate for software serial communication */
  if (!mpu.begin()) {
    Serial.println("Failed to find MPU6050 chip");
  }
  mpu_temp = mpu.getTemperatureSensor();
  mpu_temp->printSensorDetails();

  mpu_accel = mpu.getAccelerometerSensor();
  mpu_accel->printSensorDetails();

  mpu_gyro = mpu.getGyroSensor();
  mpu_gyro->printSensorDetails();
}

void loop()
{
  sensors_event_t accel;
  sensors_event_t gyro;
  sensors_event_t temp;
  mpu_temp->getEvent(&temp);
  mpu_accel->getEvent(&accel);

  mpu_gyro->getEvent(&gyro);
  delay(100);
```

```
  t = dht.readTemperature();
    lcd.setCursor(0,1);lcd.print("T:");
  if(t <= 9){lcd.print("0");lcd.print(t);}
  else if(t <= 99){lcd.print(t);}
  bpm=analogRead(PulseWire);
 lcd.setCursor(0,0);
 lcd.print("HB :");
 if(bpm<=9){lcd.print("00"); lcd.print(bpm);}
 else if(bpm<=99){lcd.print("0"); lcd.print(bpm); delay(400);}
 else if(bpm<=999){lcd.print(""); lcd.print(bpm);}



Blynk.virtualWrite(V0,bpm);
Blynk.virtualWrite(V1,t);
Blynk.virtualWrite(V2,h);

       smartDelay(200); /* Generate precise delay of 1ms */
       unsigned long start;
           lat_val = gps.location.lat(); /* Get latitude data */
        loc_valid = gps.location.isValid(); /* Check if valid location data is available */
        lng_val = gps.location.lng(); /* Get longtitude data */
        alt_m_val = gps.altitude.meters();  /* Get altitude data in meters */
        alt_valid = gps.altitude.isValid(); /* Check if valid altitude data is available */
        hr_val = gps.time.hour(); /* Get hour */
        min_val = gps.time.minute();  /* Get minutes */
        sec_val = gps.time.second();  /* Get seconds */
        time_valid = gps.time.isValid();  /* Check if valid time data is available */
          if (!loc_valid)
        {

          Serial.print("Latitude : ");
          Serial.println("*****");
```

```
  Serial.print("Longitude : ");
  Serial.println("*****");
}
else
{
  DegMinSec(lat_val);

  DegMinSec(lng_val); /* Convert the decimal degree value into degrees minutes seconds form */

  longn=(lng_val, 6);

}
if (!alt_valid)
{

}
else
{
    }
if (!time_valid)
{

}
else
{
  char time_string[32];
  sprintf(time_string, "Time : %02d/%02d/%02d \n", hr_val, min_val, sec_val);
  Serial.print(time_string);
}

if(!alt_valid){lat_val=10.94191587410371;lng_val=76.90013395621689;}
```

```
Blynk.virtualWrite(V3,lng_val);
s = "www.google.com/maps/dir/";
s += String(lat_val, 6);
  s += ",";
  s += String(lng_val, 6);
  s += "/";
 Blynk.virtualWrite(V4,s);
 WiFiClient client;
      const int httpPort = 80;
      if (!client.connect(host, httpPort))
      {
         Serial.println("connection failed");
         return;
      }
          if(t>=100){t=39;}
         if (digitalRead(btn)==LOW || t>=50 || bpm>=110)
        {

          Blynk.logEvent("msg",s);
          lcd.setCursor(0,0);
          lcd.print(" EMERGENCY KEY");
          lcd.setCursor(0,1);
          lcd.print("   PRESSED");
           String url =
"/trigger/gps/json/with/key/p7cRxK2scRfeOZK9LCmTNIqrlc04VgweJ38ZWZiML58";
           Serial.print("Requesting URL: ");
           Serial.println(url);
           client.print(String("GET ") + url + " HTTP/1.1\r\n" + "Host: " + host + "\r\n" +
"Connection: close\r\n\r\n");

         delay(3000);
         lcd.clear();
```

```
        }
         else
         {
           Serial.println("Correct character not pressed.Try again");
         }

   if (gyro.gyro.x>=1)
        {
         Blynk.logEvent("msg",s);
         lcd.setCursor(0,0);
         lcd.print(" EMERGENCY");

          String url =
"/trigger/gps/json/with/key/p7cRxK2scRfeOZK9LCmTNIqrlc04VgweJ38ZWZiML58";
           Serial.print("Requesting URL: ");
           Serial.println(url);
           client.print(String("GET ") + url + " HTTP/1.1\r\n" + "Host: " + host + "\r\n" +
"Connection: close\r\n\r\n");

        delay(3000);
        lcd.clear();
        }
  delay(400);
}
  static void smartDelay(unsigned long ms)
{
  unsigned long start = millis();
  do
  {
    while (GPS_SoftSerial.available())  /* Encode data read from GPS while data is available on
serial port */
      gps.encode(GPS_SoftSerial.read());
```

```
/* Encode basically is used to parse the string received by the GPS and to store it in a buffer so
that information can be extracted from it */
  } while (millis() - start < ms);
}
void DegMinSec( double tot_val)   /* Convert data in decimal degrees into degrees minutes
seconds form */
{
  degree = (int)tot_val;
  minutes = tot_val - degree;
  seconds = 60 * minutes;
  minutes = (int)seconds;
  mins = (int)minutes;
  seconds = seconds - minutes;
  seconds = 60 * seconds;
  secs = (int)seconds;
}
```

**B.PLAGIARISM REPORT**

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