

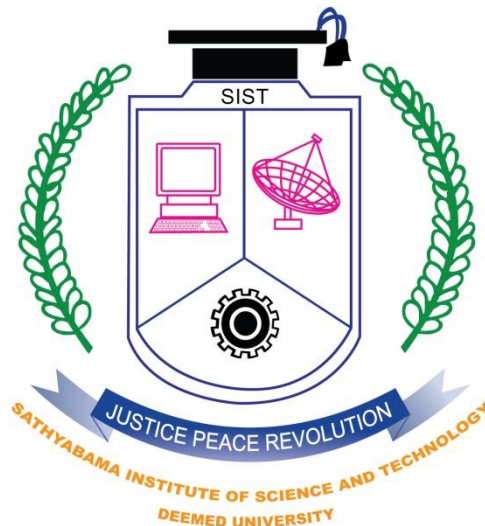
ADVANCED WOMEN SAFETY SYSTEM USING IOT TECHNOLOGY

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering Degree in
Electrical and Electronics Engineering

by

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**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119**

APRIL 2023



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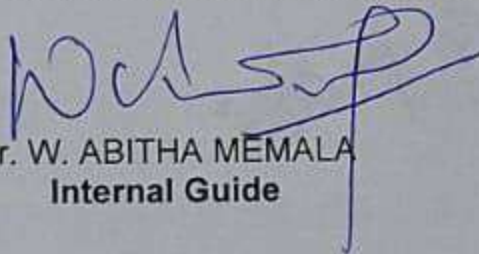
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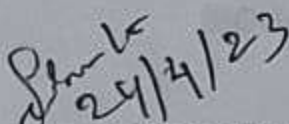
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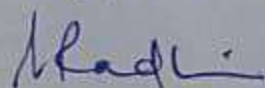
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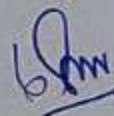
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DECLARATION

We S. ASHWINI (Reg.No.39140004) and A. LOGESHWARI (Reg.No.39140027) hereby declare that the Project Report entitled "ADVANCED WOMEN SAFETY SYSTEM USING IOT TECHNOLOGY" done by us under the guidance of Dr. W. ABITHA MEMALA is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Electrical and Electronics Engineering.

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ABSTRACT

Every girl's top concern in today's society is how to stay safe from harassment. The world is become considerably more dangerous for women. In many nations, nefarious practises including molestations, dowries, crimes against women, and—worst of all—rape are on the rise. According to WHO and NCRB social government organisation estimates, 35% of women worldwide experience abnormal health suffering in public settings. Every girl's only persistent thought is the day when they would be able to walk freely around the streets at all times without having to worry about their safety. The right to be free from violence, harassment, and discrimination applies to women. Women can be helped by removing the barriers they encounter in this dangerous atmosphere. Women can achieve their full potential as people and contributors to the workforce if the barriers they confront in this hazardous atmosphere are removed. The advanced women safety system presented in this article, called "ADVANCED WOMEN SAFETY SYSTEM USING IoT Technology," will contact and send alert messages to neighbouring police stations and family members when a woman is in danger. The location information is delivered as an SMS alert to numbers that have been saved in terms of latitude and longitude when a woman presses the button or it is automatically enabled when she is in distress. The protection and safety of women and children are the main goals of this project.

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LIST OF SYMBOLS AND ABBREVIATIONS

IOT	Internet of Things
WHO	World Health Organization
NCRB	National Crime Records Bureau
MEMS	Micro Electro Mechanical System
GPS	Global Positioning System
GSM	Global System for Mobile communication
Wi-Fi	Wireless Fidelity
LCD	Liquid Crystal Display
SMS	Short Message Service
GPRS	General Packet Radio Service
V	Voltage
I	Current
Node MCU	Node Micro Controller Unit

CHAPTER-1

INTRODUCTION

Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places. Existing handheld devices that are available for women safety require women intervention to activate them such as pressing the button or shake the device after sensing the danger. However, for some reason if a woman has no time to activate it when she is danger, the purpose of the safety device is not solved. In country like India where the growth rate of crime is considered to be more than the growth rate of population, which includes burglary, murders, rapes, and many more women's safety is believed to be one of the most important issues. According to a report by Thomson Reuters Foundation, India is ranked as a highly dangerous place for women worldwide, India has the greatest number of child brides as well.

In Today's World the safety of women is in danger especially in India. The rate of crimes against women is not decreasing but in fact increasing at an alarming rate especially harassment, molestation, eve-teasing, rape, kidnapping and domestic violence. Many preventive measures have been taken by the government to stop these misbehaving activities but still has not affected the growing rate of these crimes and has remained unaffected.

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

Women continue to experience crisis and harassment, which persists as a never-ending issue in today's society when technology has advanced to new heights and every issue has a contemporary answer. Because they are constantly concerned for their daughters' safety, parents won't let their girls travel alone. Every time they go outside, they wanted to feel secure and safe. A challenge to achieving their goals and fulfilling their responsibilities is the rise in crimes and abuse against women. Women workers are concerned about their safety and security when they have to travel at odd hours, go far away, or go to remote regions for work. Also, the growth and development of women may be threatened by this insecurity. The goal of the research is to develop a portable safety gadget for women that uses IoT to constantly monitor the user using a variety of sensors interfaced an Arduino. And suggested a portable gadget in the form of a belt that automatically activates when the pressure difference exceeds a threshold in a dangerous circumstance. IoT was a technology we employed to offer safety. This system includes a number of sensors, including temperature, moisture, pressure, heartbeat, vibration, GPS, and GSM sensors. This gadget was created with women's safety in mind. So she won't be afraid to go out alone. Also, it is portable and easy to use, allowing them to carry it with them wherever they go. Delivering our prototype to all working women, kids, college students, and seniors is our main goal.

1.1 OVERVIEW:

In the present situation, women are competing with men in every aspect of society. Girls contribute one-half to the events of our nation. However, the harassment cases are increasing day by day. Thus, it's important to ensure the protection of girls. During this paper, a projected model of a system can provide girls with the necessary safety. The projected model contains a device that will live in various positions endlessly and additionally send a message with its location to a predefined range. IOT (internet of things) may be a comparatively new and fast-developing concept. By using IOT-based technology to become victims, guardians, relatives, and police will monitor and track totally different sensors, prices, and positions of a tool. The system is simple for coming up with moveable.

The task includes the utilisation of Arduino, a movement sensor, a signal, and a straight-forward programme. At the point when the switch is on, that will trigger the alert. It will likewise send the sign to Arduino, which processes the sign and sets off the alert alongside the 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 women's security frameworks these days is a genuine interest. As the quantity of wrongdoing increases 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. In this manner, we plan to give an answer by developing a value-proficient electronic framework that has the capacity of detecting the movement of the gate crashers and setting off the caution. The essential thought in undertaking this is that all is done by triggering a basic switch on account of a crisis.

CHAPTER-2

LITERATURE SURVEY

2.1 MAJOR FINDINGS FROM LITERATURE SURVEY

Dr. Paithankar Prasad Rajendra et al., (2017) proposed the vehicle tracking system uses GPS and GSM to track and provide complete location information to user over mobile phone is a total security and fleet management solution. It is the technology used to determine the location of a vehicle using different methods like GPS and other navigation system operating via satellite and ground based stations. Modern vehicle tracking system use GPS technology to monitor and locate the vehicle anywhere on earth, but sometimes different types of automatic vehicle location technology are also used. The vehicle tracking system is fitted inside the vehicle that provides effective real time location and the data can even be stored and downloaded to a computer which can be used for analysis in future. This system is an essential device for tracking car any time the owner wants to monitor it and today it is extremely popular among people having expensive cars, used as theft prevention and recovery of the stolen car. The data collected can be viewed on electronic maps through internet and webpage. In this project Arduino Uno is used because earlier vehicle tracking system was based on very complicated and high cost microcontroller like 8051 with programming kit, ARM, etc. The main advantage of Arduino is low cost and easy to program it is also compatible with all the three operating system (Windows, Mac, Linux). This message contains the coordinates of vehicle location.

J. SriRam Pavan et al., (2018) proposed this project which presents a women safety device with GPS tracking and alerts using ARDUINO. The system can be interconnected with the alarm system and alert the neighbors. This detection and messaging system is composed of a GPS receiver, ARDUINO and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The ARDUINO processes this information and this processed information is sent to the user using GSM modem A GSM modem is interfaced to the ARDUINO. The GSM modem sends an SMS to the predefined mobile number. When a woman is in danger and in need of self-defence then she can press the switch which is allotted to her. By pressing the switch, the entire system will be activated then immediately a SMS will be sent to concern the person with location using GSM and GPS.

T. Sowmya et al., (2018) of Bapatla Women's Engineering College proposed a paper which covers descriptive details about the design and implementation of "System". The System consists of an Arduino UNO, GSM module (SIM900A), GPS module (Neo-6M), IoT module (ESP8266), Accelerometer Sensor (ADXL345), Buzzer, Panic Button, LCD. In this project, when a woman senses danger she has to press the Panic Button of the device. Once the system is activated, it tracks the current location using GPS (Global Positioning System) and sends an emergency message using GSM (Global System for Mobile communication) to the registered mobile number and nearby police station. IOT module is used to track the location continuously and update it into the webpage. Accelerometer Sensor can detect when she would fall, the buzzer is used as an alarm to alert the nearby people so that they may understand that someone is in need. The main advantage of this project is that this device can be carried everywhere since it is small and also provides safety to Women. Whenever victim senses unsafe, GSM (Global System for Mobile communication module) immediately sends the message to chosen contacts, and also the police room.: GSM

2.3 GPS: Global Positioning System

GPS module acts as the satellite and receives the data frequently and transmits similarly to the RS32. It is developed by the US department of defense (DOD). The antenna input of the module receives the GPS signals, and a complete sequential data message with the area, acceleration, and time information is pressed at the serial line. The module provides the current date, time, longitude, latitude, altitude, speed, and travel direction among other data and can be used in many applications including navigation, fleet management, tracking.

A. Anny Leema et al., (2019) of School of Information Technology & Engineering proposed an idea of using Internet of things (IOT) for Women Safety with alarm. IOT interconnects billions of devices and exchange useful information which plays a vital role in women safety. This paper summarizes the various safety measures available for women and this task goes under the piece of keen security. New perspective of women security caution framework with Arduino is proposed which has the capacity of sending SMS alert to the relatives of the victim so that women can go out and do things without hesitation. Our framework additionally has one Arduino robber alert in the framework which detects and warns the authorized person on any unauthorized intrusion. Thus the proposed system is reliable, low cost and user friendly helps women to overcome their fear in critical situation.

Mahmud Shehu Ahmed and et al., (2020) utilized various ways for interfacing the gadgets, circuits and so forth. The goals for the task are portrayed. Identify a movement – an interloper or a robber utilizing PIR sensor. Actuate the signal endless supply of criminal/gate crasher – Alarm should sound until Reset switch is squeezed. Sounds stronger than the light flashes around and offers sign to the security or encompassed people groups that interlopers go into the home. Khanna Samrat Vivekanand Omprakash depicted about the working procedure characterized by different ways and the accompanying thought is. This framework is an essential movement enacted alert. It is worked around an Arduino Microcontroller. It is associated with a PIR movement sensor, a ringer, a resistor, and a couple of outside terminals. Suman Pandit.J, et al., describe about the points of interest and hindrances in the favorable circumstances are, the given framework is helpful and convenient, and along these lines can be effectively conveyed starting with one spot then onto the next. The hardware isn't that confused and accordingly can be effectively troubleshooter. The given framework sets off an incredible bell, and it is successful as some other caution framework accessible in the market. are, the given caution framework decides the nearness of the interloper just, and doesn't decide what number of people are in there really. The caution initiates just when the individual slices through the line of the PIR sensor. What's more, the future degree for this venture are, we can add a keypad to arm or incapacitate the alert. We can decide the situation of the interloper and after that send a SMS to the concerned specialists [3]. IOT based system was developed to monitor the elder people to assure their safeties when they are alone at home. To monitor their daily activities of walking, sitting, standing and lying the Inertial Measurement Unit and threshold based algorithms were used [4]. To help female in dangerous situation of teasing, rapes, perverts, fainting suddenly IOT based system is proposed to track their location and send messages to the nearby police station and victim relatives. Arduino uno board is used as the micro controller to which the various sensors like heart beat sensor, flex sensor to measure declination, detect vibration are attached Arduino C software is used to get the details of the various sensors and micro controller.

Dr. C K Gomathy et al., of Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya (2021) proposed the project which presents a wearable safety device for women using the Arduino. The purpose of this device is to safeguard women in the event they might face any danger. The device uses wireless sensor network to

communicate and to send alerts to them. The GPS and GSM are used to share the user's location directly to the relevant authorities and saved contacts. The switch in the device works for sending manual alerts in case of emergency and as a panic switch to get the shock, then the Buzzer will also activate along with the laser diode. In this paper, a mobile-based application (I safe apps) is developed with the Android support to know whether a woman is safe. It gives the location of the woman in danger by giving fake phone calls, video forwarding, location and first-aid information.

In the past, codes like *91# have been used to send alert information to the police station in case of crises. [1] Later, a free mobile application was created to help people leave dangerous situations. The programme should be downloaded on the user's phone, and whenever they feel insecure, they should press the alert button, which sends a message with their position to the closest police station. However, many elderly persons find it difficult to utilise the programme, and an appropriate network connection should be accessible. Later on, a wearable gadget with a buzzer connected was introduced, allowing the user to hit the button in an emergency. [3] A system is created without employing smartphones because they may not be reliable. [4] The newest technological advancement, the Arduino, is presented. The Arduino is connected to GPS and GSM, and alert messages are delivered to pre-defined numbers. The user's current location is tracked using GPS, and messages are sent to pre-defined numbers using a GSM module. [5] Another wearable gadget created utilising the ESP32 Microcontroller enables the user to send location information to their parents in case of an emergency. It can also be used as a fitness band and can monitor various health factors. [6] Smart footwear is made to use a GPS module to determine the device's location and a GSM module to send a message alerting the user's family members of the location of the device. With this app, the victim can look for the closest, safest homes in the region. [8] In addition, a device that records the criminal's voice and video is created and sent to the police station as evidence to file a case against him, but it requires more data, memory space, and is not accessible to everyone. [9] A system is created combining GPS, GSM, and pressure sensors, and if the user's pressure reaches an abnormal amount, the GPS records the user's location and sends it to the police station. Yet, because the user cannot be regarded to be in danger based solely on external pressure, this is not always the best course of action. [10]

2.2 PROBLEM IDENTIFICATION

From the above papers, it is identified that the alert system for the women is done through the application. For the security purposes, the applications contain the SOS number, which will alert the family members of the victim. This also has some disadvantages:

- Victim's phone may lose
- Battery may die

2.3 SCOPE OF THE PROJECT

This paper proposes a portable device as a belt that is automatically activated when the pressure difference crosses over the threshold in an unsafe situation. The different sensors interfaced with Arduino continuously monitor the woman, and the continuously measured physiological parameters can be stored on the chip, which may be further useful for the person. If the woman presses the button, it gets activated. The device can send the victim's current location to the nearest police control room or registered mobile numbers to rescue the victim using GPS and IoT.

2.4 OBJECTIVE

The objectives of the proposed work are as follows

- To provide safety to women from precarious situation.
- To help the parents to ensure their daughter's safety.
- To rise a confident among working woman, child, women in rural areas on travelling alone.
- To provide physiological parameters to the user for their health concern.

2.5 METHODOLOGY

The paper proposes an automated, highly reliable women's security device that consists of advanced sensors embedded in a wearable device. It consists of advanced sensors and an ATMEGA8 microcontroller with an Arduino tool that keep the user

under observation at all times. It monitors the heartbeat rate, temperature, and vibration in the body through sensors to check for uneasy situations. In this work, equipment for alerting the system is designed. The Arduino controller is used for controlling the whole process of the system. The GSM is used to send SMS regarding GPS locations. Switch is pressed when the person is in danger. Here a buzzer laser diode is added, which will activate when the women press the switch.

2.6 APPLICATIONS

- ✓ Provides safety to the women and child
- ✓ Provides physiological parameters for health care.
- ✓ Prevents crime against women.
- ✓ It Can be used for monitoring the patients.
- ✓ Also be used for monitoring the physically challenged people.

CHAPTER-3

PROPOSED SYSTEM

- Our proposed system consists of sensors, Arduino with sensors tool which keep user under observation at all the times using IoT.
- We proposed a portable device as a belt that is automatically activated when the pressure difference crosses over the threshold in an unsafe situation.
- In this project, we use Heartbeat, vibration, MEMS and temperature sensor to detect the abnormalities.
- The safety wrist band can assist the person automatically and manually.
- This is possible because of the sensors, namely stress sensor, heart rate sensor and accelerometer in the wrist band.
- The continuous measured physiological parameters can be stored on the chip, which may be further useful for the person.
- Here, an Arduino UNO is used to handle the entire mechanism.
- The GPS is used to identify location.
- The device can send the victim's current location to the nearest police control room or registered mobile numbers to rescue the victim.
- The complete mechanism of the proposed system has been designed neatly as a pictorial representation in the Figure 3.1.

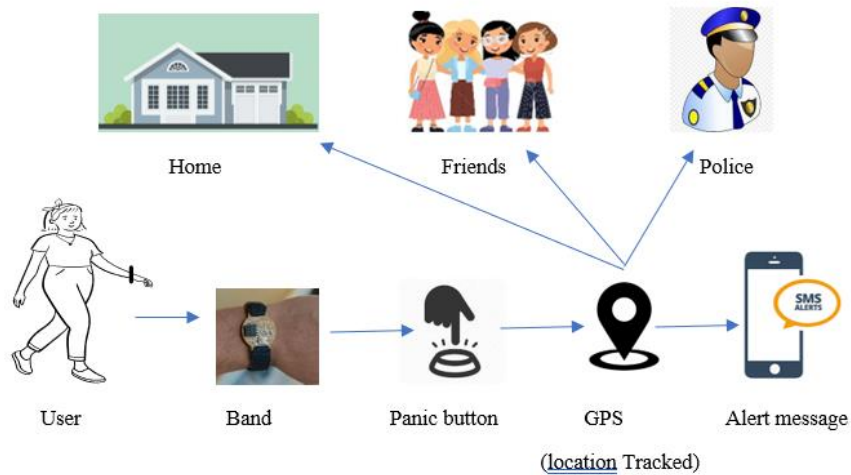


Figure 3.1. Pictorial Representation of the proposed system

3.1 PROPOSED SYSTEM BLOCK DIAGRAM:

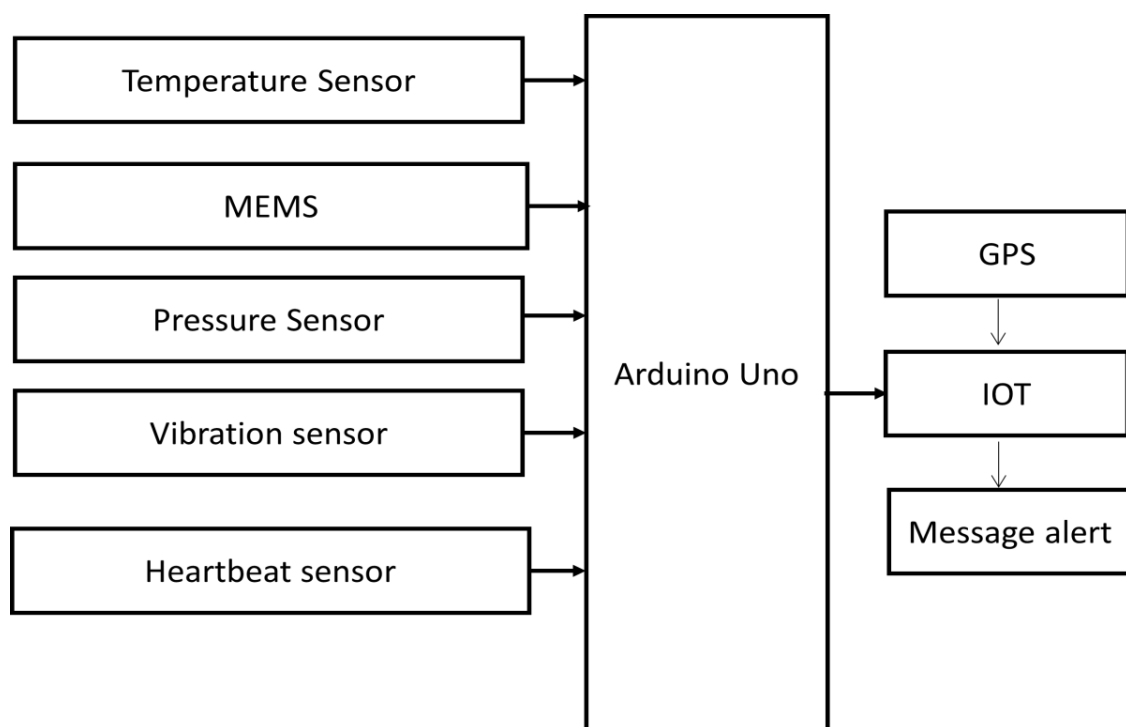


Figure 3.2 Block diagram of the proposed work

The block diagram represented in the figure 3.2 explains the working process of the proposed system,

- The sensors on the input side include temperature, MEMS, pressure, vibration, and heartbeat sensors.
- The data from these sensors will be sent to the microcontroller after they have detected the specified values coming from the intended person.
- The Arduino is connected to a microcontroller, which receives data from an input sensor.
- The embedded C language will be used to programme the Arduino so that the output will respond in accordance with the predetermined threshold value.
- Because the output is connected to the Internet of Things, we can monitor real-time values using any of the effective IOT servers.
- The entire mechanism is controlled in this case by an Arduino Uno.
- To pinpoint a place, utilise GPS.
- The tool can provide the attacker with the victim's present location.

3.2 OUTPUT VALUES FOR SENSOR (for normal and abnormal conditions)

SENSORS	VALUES AT NORMAL CONDITION (approximately)	VALUES AT ABNORMAL CONDITION (greater than or equal to)
Vibration sensor	0	1
Topple sensor	460(0 °)	Above 500(at 90 °)
Temperature sensor	31°C	Above 40°C
Heartbeat sensor	60 to 90	Above 90
Pressure sensor	1003hPa	1010hPa

Table 3.1 Sensors and their values

Table 3.1 provides the values of various sensors at normal temperature and values of sensors at abnormal condition.

3.3 CIRCUIT DIAGRAM:

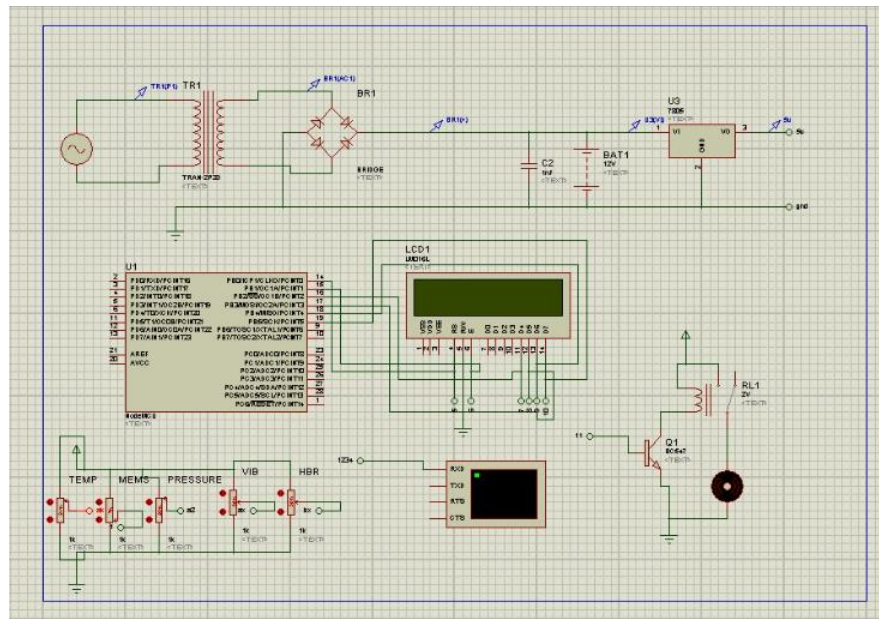


Fig 3.3 Circuit diagram of proposed system

In figure 3.3, the circuit diagram of the proposed system has designed. The various sensors such as pressure sensor, heartbeat sensor, mems sensor, temperature sensor, vibration sensors are connected to Arduino ATmega328 and Node MCU is connected to the Arduino with LCD to know about the output delivered by GPS and GSM.



Figure 3.4 Output of the simulation

The output of the simulation is represented in figure 3.4. Whenever the pressure senses an abnormal value or the buzzer is pressed it calculates the latitude and longitude and gives the current location for every five minutes with the help of GPS and GSM module. Here the location is calculated in terms of longitude and latitude, further in development the exact location will be sent as a link to the receiver.

3.4 HARDWARE REQUIREMENTS

The following are the hardware requirements in this project.

- Arduino UNO
- Temperature sensor
- Pressure sensor
- vibration sensor
- MEMS
- Heartbeat sensor
- GPS
- Connecting wires

3.5 HARDWARE DESCRIPTION:

3.5.1 ARDUINO UNO:

The Arduino microcontroller is an easy-to-use yet powerful single-board computer that has gained considerable traction in the hobby and professional markets. The Arduino is open-source, which means hardware is reasonably priced and development software is free. This guide is for students in ME 2011, or students anywhere, who are confronting the Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources.

This guide covers the Arduino Uno board (SparkFun DEV-09950, \$29.95), a good choice for students and educators. With the Arduino board, you can write programmes and create interface circuits to read switches and other sensors and to control motors and lights with very little effort.

This is what the Arduino board looks like.



Figure 3.5 Arduino UNO

The board features an Atmel ATmega328 microcontroller operating at 5 V with 2 KB of RAM, 32 KB of flash memory for storing programs and 1 KB of EEPROM for storing parameters. The clock speed is 16 MHz, which translates to about executing about 300,000 lines of C source code per second. The board has 14 digital I/O pins and 6 analog input pins. There is a USB connector for talking to the host computer and a DC power jack for connecting an external 6-20 V power source, for example a 9 V battery, when running a program while not connected to the host computer. Headers are provided for interfacing to the I/O pins using 22 g solid wire or header connectors.

An important feature of the Arduino is that you can create a control program on the host PC, download it to the Arduino and it will run automatically. Remove the USB cable connection to the PC, and the program will still run from the top each time you push the reset button. Remove the battery and put the Arduino board in a closet for six months. When you reconnect the battery, the last program you stored will run. This means that you connect the board to the host PC to develop and debug your program, but once that is done, you no longer need the PC to run the program.

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

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3.5.1.1 Summary:

Microcontroller ATmega328

Operating Voltage 5V

Input Voltage (recommended) 7-12V

Input Voltage (limits) 6-20V

Digital I/O Pins 14 (of which 6 provide PWM output)

Analog Input Pins 6

DC Current per I/O Pin 40 mA

DC Current for 3.3V Pin 50 mA

Flash Memory 32 KB (ATmega328) of which 0.5 KB used by bootloader

SRAM 2 KB (ATmega328)

EEPROM 1 KB (ATmega328)

Clock Speed 16 MHz

3.5.1.2 Pin Configuration

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- **VIN.** The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- **5V.** This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board.
- **3V3.** A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50mA.
- **GND.** Ground pins.
- **IOREF.** This pin on the Arduino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs for working with the 5V or 3.3V.

3.5.1.3 MEMORY:

The ATmega328 has 32 KB (with 0.5 KB used for the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM.

3.5.1.4 Input and Output

Each of the 14 digital pins on the Uno can be used as an input or output, using pin Mode(), digital Write(), and digital Read() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull- up resistor (disconnected by default) of 20-50 kilo ohms. In addition, some pins have specialized functions:

3.5.1.5 Serial: 0 (RX) and 1 (TX). Used to receive (RX) and Trans mit (TX) TTL serial data.

These pins are connected to the corresponding pins of the ATmega8U2 USB Serial chip.

There are a couple of other pins on the board:

- **AREF.** Reference voltage for the analog inputs. Used with analog Reference ().
- **Reset:** Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

3.5.2 Pressure sensor:

A pressure sensor measures pressure, typically of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

Pressure sensors are used for control and monitoring in thousands of everyday applications. Pressure sensors can also be used to indirectly measure other variables such as fluid/gas flow, speed, water level, and altitude. Pressure sensors can alternatively be called pressure transducers, pressure transmitters, pressure senders, pressure indicators, piezometers and manometers, among other names.

Pressure sensors can vary drastically in technology, design, performance, application suitability and cost. A conservative estimate would be that there may be over 50 technologies and at least 300 companies making pressure sensors worldwide.

There is also a category of pressure sensors that are designed to measure in a dynamic mode for capturing very high-speed changes in pressure. Example applications for this type of sensor would be in the measuring of combustion pressure in an engine cylinder or in a gas turbine. These sensors are commonly manufactured out of piezoelectric materials such as quartz.

Some pressure sensors, such as those found in some traffic enforcement cameras, function in a binary (off/on) manner, i.e., when pressure is applied to a pressure sensor, the sensor acts to complete or break an electrical circuit. These types of sensors are also known as a pressure switch.

The BMP180 series is designed to sense absolute air pressure in an altimeter or barometer applications.

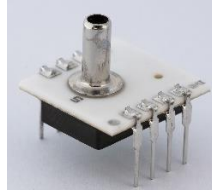


Fig 3.6 Pressure Sensor

Advantages:

- High output signal level
- Adaptable to many applications
- Technology robustness

Applications:

- 1) Security purposes- pressure sensors are nowadays used as alarms to detect any change in pressure in vaults and sensitive areas.
- 2) Aerodynamics of automobiles: The wind tunnelling tests of automobiles or defence equipment are dependent on their pressure characteristics which are sensed by pressure sensors

3.5.3 MEMS:

Micro-electromechanical systems (MEMS) is a technology that combines computers with tiny mechanical devices such as sensors, valves, gears, mirrors, and actuators embedded in semiconductor chips. MEMS or what he calls analogue computing will be "the foundational technology of the next decade." MEMS is also sometimes called *smart matter*.

MEMS are already used as accelerometers in automobile air-bags. They've replaced a less reliable device at lower cost and show promise of being able to inflate a bag not only on the basis of sensed deceleration but also on the basis of the size of the person they are protecting. Basically, a MEMS device contains micro-circuitry on a tiny silicon chip into which some mechanical device such as a mirror or a sensor has

been manufactured. Potentially, such chips can be built in large quantities at low cost, making them cost-effective for many uses.

Among the presently available uses of MEMS or those under study are:

- Global position system sensors that can be included with courier parcels for constant tracking and that can also sense parcel treatment en route.
- Sensors built into the fabric of an airplane wing so that it can sense and react to air flow by changing the wing surface resistance; effectively creating a myriad of tiny wing flaps
- Optical switching devices that can switch light signals over different paths at 20-nanosecond switching speeds.
- Sensor-driven heating and cooling systems that dramatically improve energy savings
- Building supports with imbedded sensors that can alter the flexibility properties of material based on atmospheric stress sensing.

Visual Diagram:

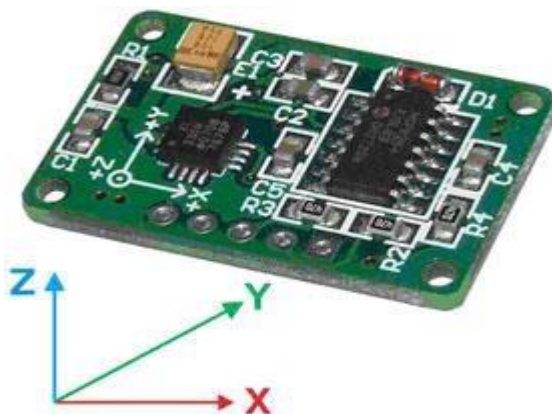


Figure 3.7 Visual Diagram of MEMS Sensor

FUNCTIONAL DIAGRAM:

One of the newer sensors to come about in recent times is the accelerometer. Granted the idea and implementation of a sensor that measures acceleration has been around for a long time the newer technologies available to industry have made them super accurate. The MEMS Accelerometer usually comes in the smallest surface mount package and can detect acceleration in up to 3 axis. This tutorial will cover

capturing data for only one axis. The [PIC](#) will be used to capture the data and make sense of it.

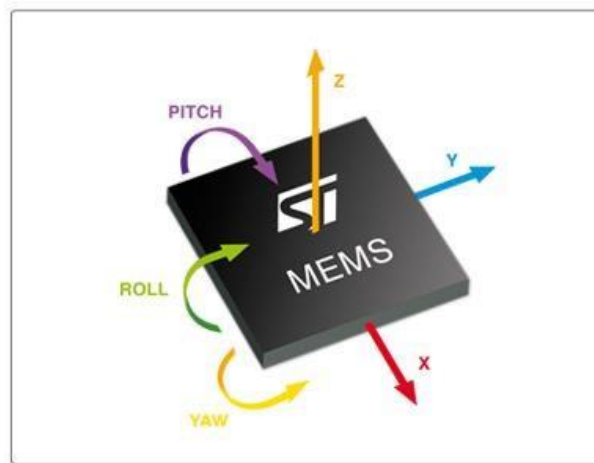


Figure 3.8 MEMS Sensor

3.5.4 VIBRATION SENSORS:

The piezoelectric sensor is used for flex, touch, vibration and shock measurement. Its basic principle, at the risk of oversimplification, is as follows: whenever a structure moves, it experiences acceleration. A piezoelectric shock sensor, in turn, can generate a charge when physically accelerated. This combination of properties is then used to modify response or reduce noise and vibration.

It is important because vibration and shock can shorten the life of any electronic and electromechanical system. Delicate leads and bond wires can be stressed, especially after exposure to long term vibration. Solder joints can break free and PCB traces can even so slightly tear from impact and impulse shock, creating the hardest type of system failure to debug; an intermittent failure.

This article discusses piezoelectric shock and vibration sensors and sensor technology, focusing on available products (all parts mentioned here can be found on the Digi-Key website — links are provided), as well as design issues and design techniques.

3.5.5 HEARTBEAT SENSOR:

A person's heartbeat is the sound of the valves in his/her's heart contracting or expanding as they force blood from one region to another. The number of times the heart beats per minute (BPM), is the heart beat rate and the beat of the heart that can be felt in any artery that lies close to the skin is the pulse.

Working of a Heartbeat Sensor

The basic heartbeat sensor consists of a light emitting diode and a detector like a light detecting resistor or a photodiode. The heart beat pulses cause a variation in the flow of blood to different regions of the body. When a tissue is illuminated with the light source, i.e. light emitted by the led, it either reflects (a finger tissue) or transmits the light (earlobe). Some of the light is absorbed by the blood and the transmitted or the reflected light is received by the light detector. The amount of light absorbed depends on the blood volume in that tissue. The detector output is in form of electrical signal and is proportional to the heart beat rate.

This signal is actually a DC signal relating to the tissues and the blood volume and the AC component synchronous with the heart beat and caused by pulsatile changes in arterial blood volume is superimposed on the DC signal. Thus the major requirement is to isolate that AC component as it is of prime importance.

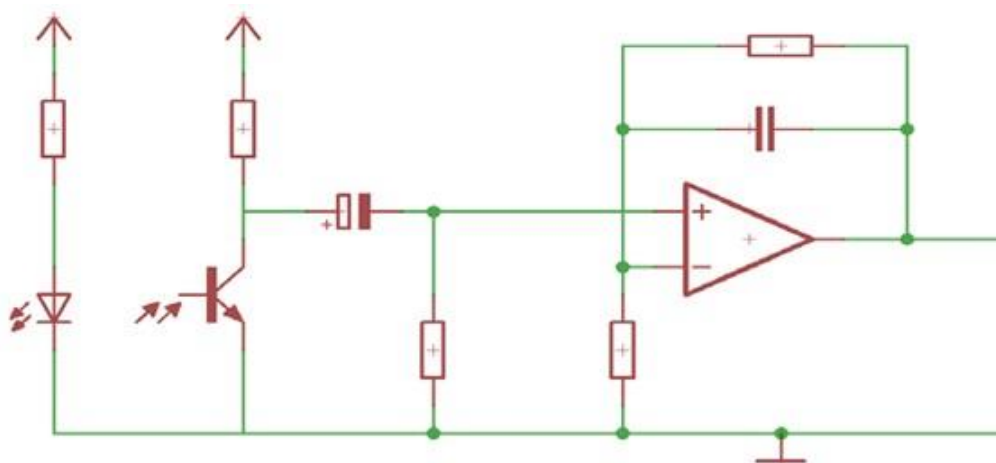


Figure 3.9 Working of Heart beat Sensor

To achieve the task of getting the AC signal, the output from the detector is first filtered using a 2 stage HP-LP circuit and is then converted to digital pulses using a

comparator circuit or using simple ADC. The digital pulses are given to a microcontroller for calculating the heart beat rate,

$$\text{BPM(Beats per minute)} = 60 * f$$

Where f is the pulse frequency

Another example is TCRT1000, having 4 pins-

Pin1: To give supply voltage to the LED

Pin2 and 3 are grounded. Pin 4 is the output. Pin 1 is also the enable pin and pulling it high turns the LED on and the sensor starts working. It is embedded on a wearable device which can be worn on the wrist and the output can be sent wirelessly (through Bluetooth) to the computer for processing.



Figure 3.10 Applications of Heart beat Sensor

Application Developing your own Heartbeat Sensor System

A basic Heartbeat Sensor system can also be built using basic components like a LDR, comparator IC LM358 and a Microcontroller as given below

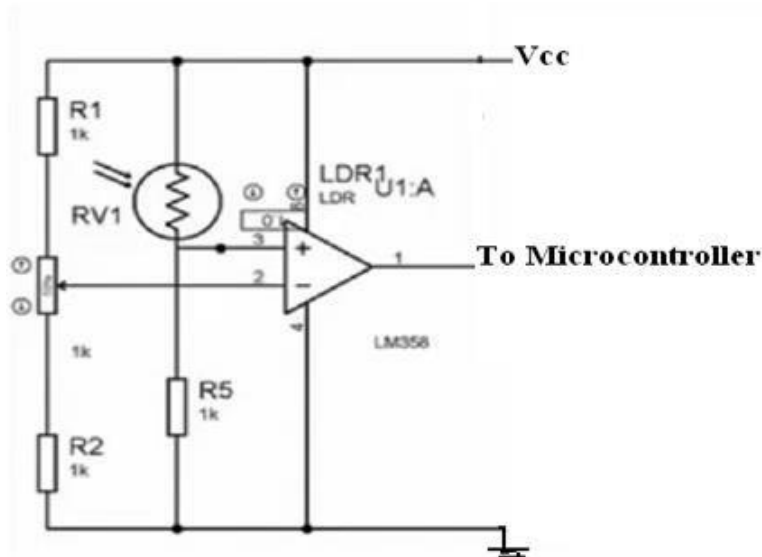


Figure 3.11 circuit diagram of Heart beat Sensor

3.5.6 GPS:

- The Global Positioning System (GPS) is a space-based radio navigation system that
- provides reliable positioning, navigation, and timing services to users on a continuous worldwide basis -- freely available to all.

The GPS is made up of three parts:

1. Satellites which are orbiting the Earth
2. Control and monitoring stations on the Earth
3. The GPS receivers owned by the users.

- Satellite Navigation is based on a global network of satellites that transmit radio signals from medium earth orbit. Users of Satellite Navigation are most familiar with the 31 Global Positioning System (GPS) satellites developed and operated by the United States.
- Three other constellations also provide similar services. Collectively, these constellations and their augmentations are called Global Navigation Satellite

Systems (GNSS). The other constellations are GLONASS developed and operated by the Russian Federation, Galileo developed and operated by the European Union, and BeiDou, developed and operated by China.

- All providers have offered free use of their respective systems to the international community. All providers have developed International Civil Aviation Organization (ICAO) Standards and Recommended Practices to support use of these constellations for aviation.

A variety of GPS modules designed for many different applications. The modules are classified into two families: FGPMOSLx and FGPMOPAx series (x denotes the model number). The major difference between these two families is the inclusion of smart patch antenna. PAx comes with the ceramic antenna, while SLx does not. These GPS modules provide a complete GPS solution that excels in position, speed, and accuracy performances as well as high insensitivity and tracking capabilities in urban environment. The GPS module are powered by MediaTek Inc. GPS chipset, the world's leading digital media solution provider and largest fab-less IC Company.

3.5.6.1 Circuit Design

Power supply Vcc

It is necessary to provide a clean and stable power supply for our GPS module in order to obtain good performances (Ex: TTFF). Unstable power source will have a significant negative impact on the GPS performance. To achieve this, the Vcc ripple must be controlled under 50mVpp.

In addition, there are also some important suggestions for main power circuit design:

- Add ferrite bead, power choke or low pass filter for power noise reduction
- Use linear regulator for voltage regulation
- Use enough decoupling capacitors for stable voltage due to current variation.

3.5.6.2 UART 0 (RX/TX) –Serial Interface

UART is the default interface, and it supports transfer baud rate ranging from 4800 bps to 115200 bps. The logic is TTL level. If the RS232 logic-level is needed for application, then the use of level shifters is necessary. Please leave RX open if it is not used, there is an internal pull-up to VCC. Please don't use an external pull-up for unexpected current draw.

3.5.6.3 Antenna Design, ANTENNA_IN

GPS antenna is a receiving device to acquire weak GPS signal from sky. Popular solution would be ceramic patch antenna due to its small form factor with low cost. There are two types of antennas, passive and active. Passive antenna is with solely antenna itself. Active antenna is with LNA to have high gain with the cost of current supply.

Antenna can be chosen according to radiation efficiency, radiation pattern, gain, bandwidth, form factor and cost. Make sure the ground plane is sufficient for the antenna to operate with acceptable performance.

3.6 SOFTWARE REQUIREMENTS:

Arduino IDE Software

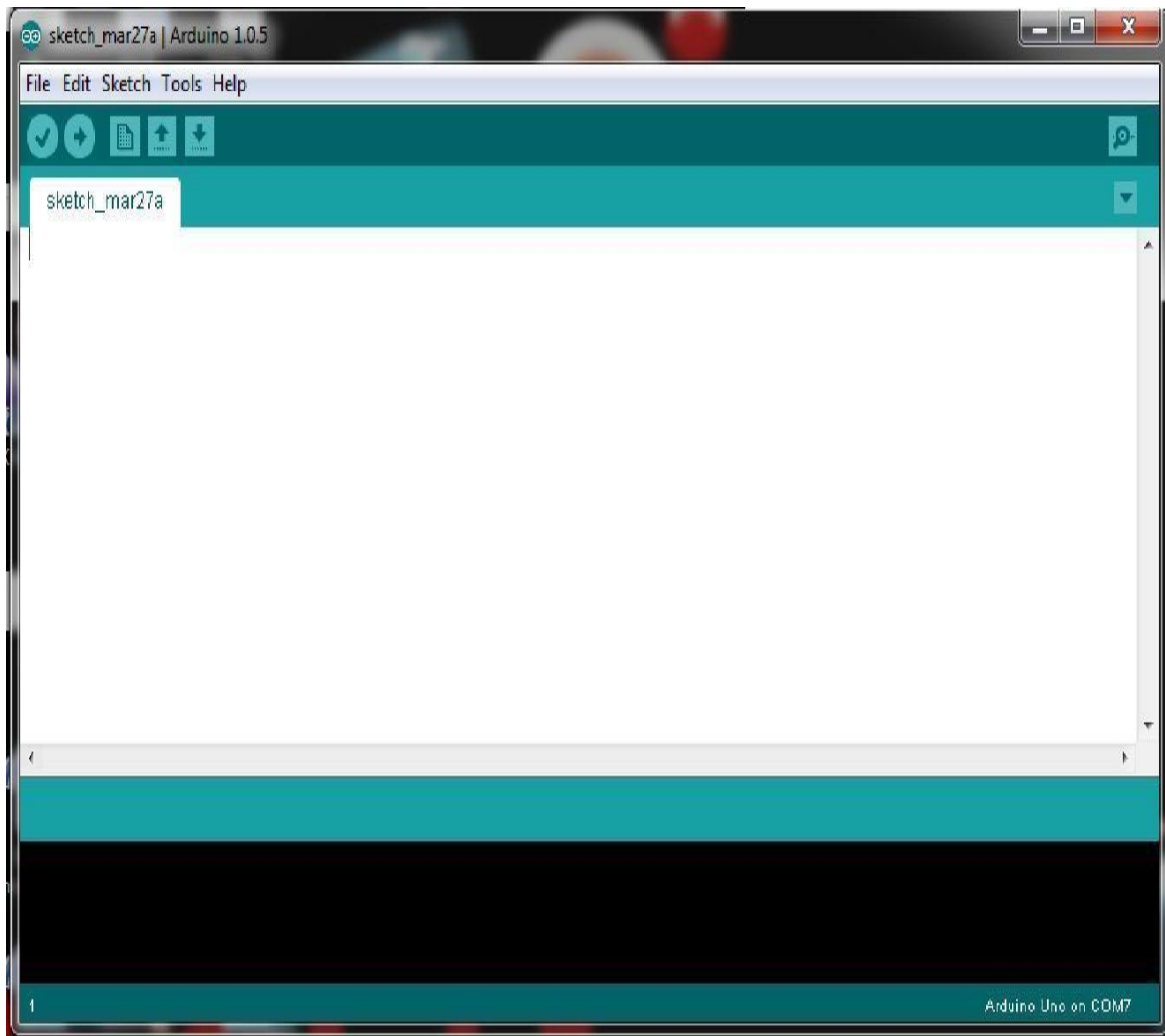


Figure 3.12 Arduino IDE software

The source code which has been developed using embedded C is uploaded in the Arduino IDE shown in figure 3.12. The program runs and the output of this program is embedded to microcontroller to perform its required action.

3.6.1 NODE MCU:

NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module

Programming NodeMCU ESP8266 with Arduino IDE

The NodeMCU Development Board can be easily programmed with Arduino IDE since it is easy to use.

Programming NodeMCU with the Arduino IDE will hardly take 5-10 minutes. All you need is the Arduino IDE, a USB cable and the NodeMCU board itself. You can check this [Getting Started Tutorial for NodeMCU](#) to prepare your Arduino IDE for 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.

needed.

Both the firmware and prototyping board designs are open source.

The firmware uses the Lua scripting language. The firmware is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson and SPIFFS. Due to resource constraints, users need to select the modules relevant for their project and build a firmware tailored to their needs. Support for the 32-bit ESP32 has also been implemented.

The prototyping hardware typically used is a circuit board functioning as a dual in-line package (DIP) which integrates a USB controller with a smaller surface-mounted board containing the MCU and antenna. The choice of the DIP format allows for easy prototyping on breadboards. The design was initially based on the ESP-12 module of the ESP8266, which is a Wi-Fi SoC integrated with a Tensilica Xtensa LX106 core, widely used in IoT applications.

3.6.1.1 NodeMCU ESP8266

Following are the specifications and features of NodeMCU

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

3.7 DISADVANTAGES OF EXISTING SYSTEM:

- In the Existing system there is no monitoring system for girls, it should create many problems for them and the no safety mechanism to protect the girls from the misbehavior activities.
- In addition, there is no alert mechanism for the girl's safety it should be done by manually only.
- Having this concern in mind many developers have come up with creative applications.
- Some of such applications are: Codes like *91# is used to provide emergency services, which will alert police control. Free mobile application 'Help me on mobile' to ensure safety of women was launched to assist those who need emergency.

- There is no hidden camera detector which is portable to ensure our privacy.

3.8 ADVANTANGES OF PROPOSED SYSTEM:

- Provide high security.
- Easy tracking method.
- Avoid the risk of women missing.
- By using Arduino, we can reduce the cost.
- This is a very efficient and easily adaptable system.
- By using IOT we can monitor the real time data anywhere.
- The system can be easily implemented in the real time.
- Can be used for future scope of development.
- During Product development, it can be made compact in size.

CHAPTER 4

FLOW CHART AND PROGRAM CODE

4.1 FLOW CHART

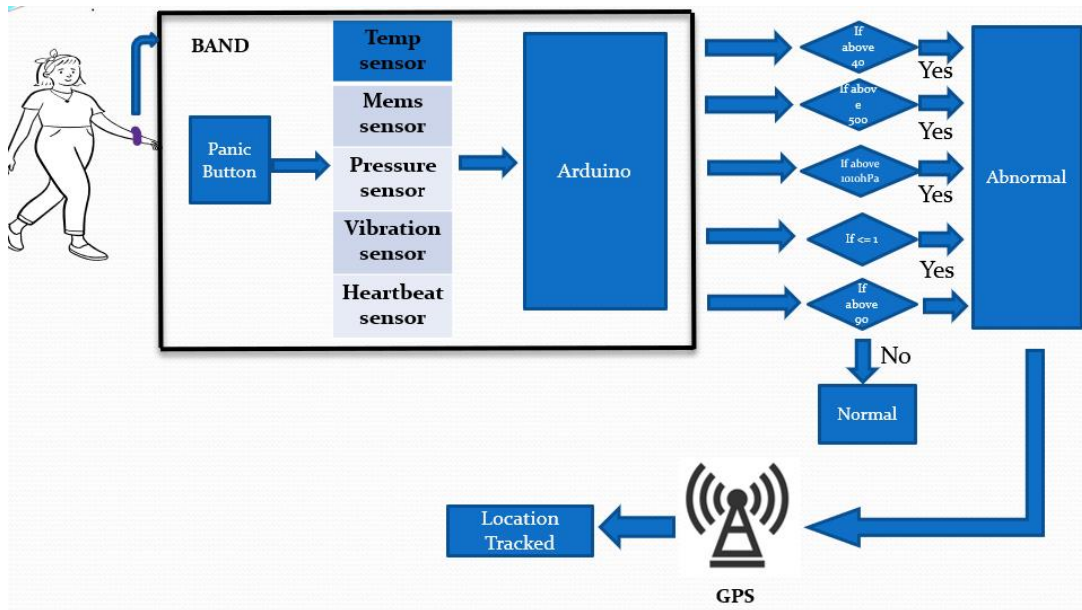


Figure 4.1. Flow Chart of Transmitter's End

Figure 4.1 shows that when any sensor detects an abnormal condition, the microcontroller receives instructions, and the GPS calculates the victim's current latitude and longitude data. By using the GSM module, latitude and longitude information can be sent by SMS to the recipient and saved phone numbers for the local police station and microcontroller. Every minute, GSM will send an SMS to the registered mobile numbers. SMS messages are sent to registered mobile numbers. The victim's current location is tracked using an IoT module, which also updates the webpage with the victim's location. The buzzer in the device is controlled by the microcontroller, and if it is activated, the nearby people may learn that someone is in danger and rush to their aid.

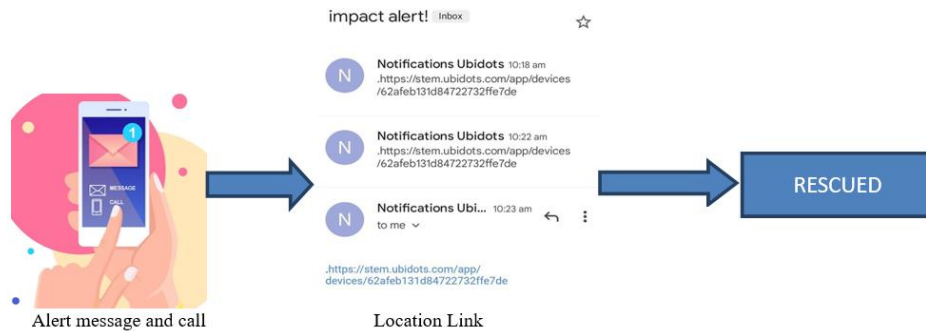


Figure 4.2 *Flow chart of Receiver's End*

Figure 4.2 shows the flowchart of the receiver's end. This figure shows what happens when the victim's friends or parents learn about the alert and the location. By calling them and inquiring about the situation, they can assure the safety of their daughter, or they can wait a short while for the victim to provide more information. By sending the victim's location connection to the closest police station, they can alert them if they notice anything strange. The victim's location will be updated once each minute. The victim's parent or friend can view the victim's address or location as well as their physiological characteristics, such as their heart rate, blood pressure, and body temperature range, via the IoT platform. They can quickly determine whether their buddy or daughter is indeed in jeopardy by using these health readings. They can quickly determine from the health readings whether their buddy or daughter is actually in difficulty or whether they accidentally touched the button. The victim will be rescued by the police after receiving a complaint, a link to their location, and information about their health.

4.2 PROGRAM CODE:

This source code is developed using Embedded C which should be programmed and uploaded in Arduino IDE software development and embedded to the microcontroller for alerting and train the sensor to the detect the abnormal values.

```

#include <SoftwareSerial.h>

SoftwareSerial mySerial(5, 4);

#include "Ubidots.h"

const char* UBIDOTS_TOKEN = "BBFF-
UxVqfGrhG7w6yvvVvyUqO2NYMP915V"; // Put here your Ubidots TOKEN

const char* WIFI_SSID = "womensafety"; // Put here your Wi-Fi SSID

const char* WIFI_PASS = "12345678"; // Put here your Wi-Fi password


Ubidots ubidots(UBIDOTS_TOKEN, UBI_HTTP);


int firstVal, secondVal, thirdVal, fourthVal,fifthVal,sixthVal,seventhVal;

int j=0;

int b=0;

void setup() {
  Serial.begin(9600);
  mySerial.begin(9600);
  ubidots.wifiConnect(WIFI_SSID, WIFI_PASS);
  pinMode(D0,OUTPUT);
  digitalWrite(D0,LOW);
  delay(250);
  digitalWrite(D0,HIGH);
  delay(250);
  digitalWrite(D0,LOW);
  delay(250);
  digitalWrite(D0,HIGH);
  delay (250);

```

```

digitalWrite(D0,LOW);delay(500);
digitalWrite(D0,HIGH); delay(500);
digitalWrite(D0,LOW);delay(500);
}

void loop() {
  if (mySerial.available() > 0)
  {
    String a = mySerial.readString();
    Serial.println(a);
    digitalWrite(D0,HIGH);
    delay(50);
    digitalWrite(D0,LOW);

    for (int i = 0; i < a.length(); i++)
    {
      if (a.substring(i, i+1) == ",")
      {
        j++;
        if (j==1)
        {
          firstVal = a.substring(0, i).toInt();
          Serial.print("first : ");
          Serial.println(firstVal);
          ubidots.add("Pressure", firstVal);

```

```

    b=i;
}
else if (j==2)
{
    secondVal = a.substring(b+1, i).toInt();
    Serial.print("Second : ");
    Serial.println(secondVal);
    ubidots.add("Topple", secondVal);
    b=i;
}
else if (j==3)
{
    thirdVal = a.substring(b+1, i).toInt();
    Serial.print("Third : ");
    Serial.println(thirdVal);
    ubidots.add("Pulse", thirdVal);
    b=i;
}
else if (j==4)
{
    fourthVal = a.substring(b+1, i).toInt();
    Serial.print("Fourth : ");
    Serial.println(fourthVal);
    ubidots.add("Temperature", fourthVal);
    b=i;
}
else if (j==5)

```

```

    {
        fifthVal = a.substring(b+1, i).toInt();
        Serial.print("Fifth : ");
        Serial.println(fifthVal);
        ubidots.add("Impact", fifthVal);
        b=0;
        j=0;
    }

}

}

    bool bufferSent = false;

    bufferSent = ubidots.send(); // Will send data to a device label that
matches the device Id

    if (bufferSent) {
        Serial.println("Values sent by the device");
    }
}

}

int alert()
{
    digitalWrite(D0,HIGH);
    delay(250);
    digitalWrite(D0,LOW);
    delay(250);
    digitalWrite(D0,HIGH);

```

```

digitalWrite(D0,LOW);
delay(250);
}

```

```

#include <Wire.h>
#include <SPI.h>
#include <Adafruit_BMP280.h>

```

```

Adafruit_BMP280 bmp; // use I2C interface
Adafruit_Sensor *bmp_temp = bmp.getTemperatureSensor();
Adafruit_Sensor *bmp_pressure = bmp.getPressureSensor();

```

```

int i=0;
void setup() {
  Serial.begin(9600);
  if (!bmp.begin()) {
    Serial.println(F("Could not find a valid BMP280 sensor, check wiring!"));
    while (1) delay(10);
  }
}

```

```

attachInterrupt(digitalPinToInterrupt(2), change, CHANGE);
bmp.setSampling(Adafruit_BMP280::MODE_NORMAL, /* Operating
Mode. */

Adafruit_BMP280::SAMPLING_X2, /* Temp. oversampling */
Adafruit_BMP280::SAMPLING_X16, /* Pressure oversampling
*/

Adafruit_BMP280::FILTER_X16, /* Filtering. */
Adafruit_BMP280::STANDBY_MS_500); /* Standby time. */

```

```

bmp_temp->printSensorDetails();
}
void loop() {
sensors_event_t temp_event,
pressure_event; bmp_temp-
>getEvent(&temp_event); bmp_pressure-
>getEvent(&pressure_event);
int topple =
analogRead(A1); int pulse =
analogRead(A2);
int temperature = analogRead(A0);
int resp = digitalRead(16);
float mv = (
temperature/1024.0)*5000; float cel =
mv/10;
Serial.print(pressure_event.pressure); Serial.print(",");
Serial.print(topple); Serial.print(",");
Serial.print(random(79,88)); Serial.print(",");
Serial.print(temp_event.temperature); Serial.print(",");
Serial.print(i); Serial.println(",");
i=0;
delay(5000);
}
void change()
{i=1;}

```

CHAPTER 5

HARDWARE AND RESULT

The proposed design will deal with critical issues faced by women during the night and provide security with advanced technology. While society may or may not change its mindset but this device is will help to feel women independent.

The main purpose of the work is to provide safety and security to the women in danger situation. When any sensor senses the abnormal condition, the microcontroller gets the commands and the GPS will calculate the current latitude and longitude values of the victim. GSM module will send SMS which contains latitude and longitude values to the numbers already stored in the microcontroller and nearby police station. GSM will send SMS to the registered mobile numbers for every 1minute. The SMS send to the registered mobile numbers. IoT module will track the current location of the victim and it will update the location on the webpage. The microcontroller will switch ON the buzzer in the device, so that nearby people may come to know that someone is in danger and they will come to rescue.

5.1 CONSTRAINTS

Constraints for a safety system for women are limitations and restrictions that must be taken into account when designing and developing the system. These constraints may relate to technical, environmental, or other factors that can impact the performance and effectiveness of the system. Some possible constraints for such a system might include:

There are several possible constraints for women safety devices developed using sensors and IoT, including:

1. **Size and portability:** The device needs to be small and portable enough to be carried on a person at all times, without causing discomfort or inconvenience.

2. **Power Management:** IoT devices require power to operate, and devices that are constantly connected to the network can drain battery life quickly. Optimizing power management can be challenging for IoT devices, especially those that require continuous monitoring.
3. **Privacy concerns:** The device should not compromise the privacy or security of the user, and any data collected by the sensors should be stored securely and used only for the intended purpose.
4. **Cost:** The device should be affordable and accessible to a wide range of users, including those in low-income communities.
5. **User Experience:** The device needs to be easy to use and understand, even for those who are not tech-savvy. The user interface should be intuitive, and the device should be designed to minimize user errors.
6. **Security:** IoT devices are often vulnerable to cyber-attacks, and women's safety devices may contain sensitive information that could be compromised. The device needs to be secured against hacking and unauthorized access to ensure user safety and privacy.

5.2 IEEE STANDARDS:

IEEE P2668.1 - Standard for Personal Emergency Response Systems (PERS) for the Safety of Women

This standard provides guidance for the development of personal emergency response systems specifically designed for women. It covers topics such as system design, communication protocols, and user interfaces.

IEEE P2933 - Standard for the Safety and Well-being of Women in Smart Cities

This standard focuses on the use of IoT devices and technologies to enhance the safety and well-being of women in urban environments. It covers topics such as sensor deployment, data privacy, and system interoperability.

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IEEE P2413 - Standard for an Architectural Framework for the Internet of Things (IoT)

This standard provides a framework for designing and developing IoT systems, including those related to women's safety. It covers topics such as system architecture, interoperability, and security.

IEEE P2418.1 - Standard for the Architectural Framework for the Internet of Things: Application Layer

This standard provides guidance on the design of IoT applications, including those related to women's safety. It covers topics such as application architecture, data management, and system integration.

IEEE 802.15.4 - Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (LR-WPANs)

This standard specifies the wireless communication protocols used in many IoT devices, including those related to women's safety. It covers topics such as network topology, data transfer rates, and power consumption.

These standards provide guidance and best practices for developing women safety systems using IoT and sensors. Adherence to these standards can help ensure interoperability, data privacy, and system security, and improve the overall effectiveness of these devices in enhancing women's safety.

5.3 TRADE-OFFS:

There are several trade-offs that need to be considered when developing women's safety systems using IoT and sensors, including:

Privacy vs. Safety: The use of sensors and IoT devices in women's safety systems may raise privacy concerns, as personal information and location data may be collected and transmitted. To balance privacy and safety, developers must ensure that data is only collected and used for its intended purpose, and that appropriate safeguards are put in place to protect user privacy.

Cost vs. Effectiveness: IoT devices can be expensive to manufacture and deploy, and the cost can limit accessibility for certain user groups. To ensure the effectiveness of the system, developers must balance the cost of the device against its potential benefits and ensure that the system is affordable and accessible to a wide range of users.

Accuracy vs. False Alarms: The sensors used in women's safety systems must be accurate enough to detect potential threats and respond accordingly. However, false alarms can be a major issue, as they can lead to unnecessary panic and stress. Developers must balance the sensitivity of the sensors against the risk of false alarms to ensure that the system is effective and reliable.

Connectivity vs. Battery Life: IoT devices rely on network connectivity to communicate and transfer data. However, constant connectivity can drain the device's battery life quickly, reducing its effectiveness. Developers must balance the need for connectivity with the need for a long-lasting battery to ensure that the device can be relied upon in an emergency situation.

User Experience vs. Security: The device needs to be easy to use and understand, even for those who are not tech-savvy. However, the device must also be secured against hacking and unauthorized access to ensure user safety and privacy. Developers must balance the need for a user-friendly interface with the need for strong security measures to ensure that the system is effective and easy to use.

Cultural and Social Norms vs. Functionality: Some cultural and social norms may make it difficult for women to use or carry IoT-based safety devices openly, which could limit their effectiveness. Developers must balance the cultural and social context of the target user group with the need for device functionality to ensure that the system is effective and widely adopted.

5.4 HARDWARE LAYOUT:



Figure 5.1 Hardware Layout

The figure 5.1 shows the hardware layout of the proposed system which suggests a wearable device with integrated high-tech sensors for automatic, extremely dependable women security. It has cutting-edge sensors, an ATMEGA8 microcontroller, and an Arduino tool that constantly monitor the user. Through sensors, it keeps an eye on the body's temperature, vibration, and cardiac rate to look for uncomfortable circumstances. The design of equipment to alert the system

is done in this task. The entire system's operation is controlled by an Arduino controller. GPS location-related SMS are sent over GSM. When someone is in danger, the switch is pressed. A buzzer laser diode has been installed in this place, and it will turn on when a woman presses the switch.

5.5 OUTPUT:

MESSAGE MAIL ALERT

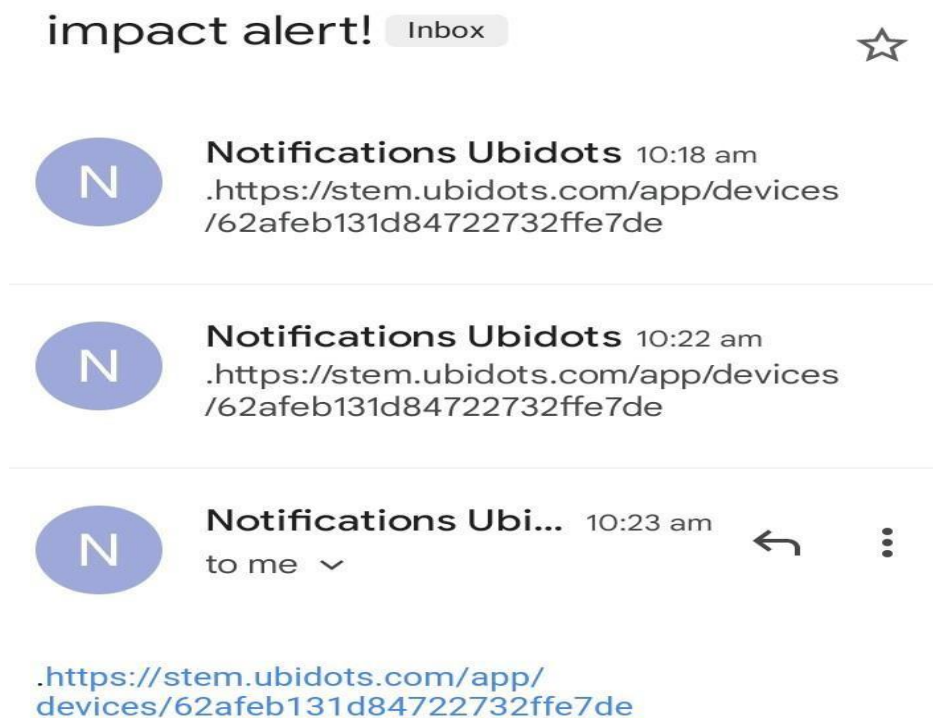


Figure 5.2 Message alert with location of the user.

When the sensor senses any undefined values, we can receive an alert mail like the above. By clicking the above link, we can check the current location of the device/person.

CHAPTER 6

CONCLUSION

The project will solve the critical issues faced by women and will help to solve them with technologically sound equipment and ideas. The intention of this project is not only provide safety and it also provides security by means of self-defence mechanism. The crime against the women can be now brought to an end with the help of real system implementation of the proposed model.

The suggested design will address important problems and contribute to their resolution using cutting-edge tools and concepts. The strength of this approach is that it offers security through a self-defence mechanism in addition to safety. With true system implementation of the suggested paradigm, the crime against women can now be put an end. In this paper, we suggest and present an Internet of Things-based safety gadget. The purpose of this safety feature is to protect women and children from harassment at all times. The tool can immediately alert law enforcement to take legal action against the offenders. In order to save the victim, the device can also send the victim's location to the closest police station. The tool is very user-friendly, and it can be used easily and affordably by users of various skill levels.

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