

DIGI – SOLES – Safety Shoes for Women and Elderly People

PROJECT REPORT

Submitted for the course: Internet Of Things (CSE3009)

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April, 2019

OBJECTIVE

To create a safety shoe for people (especially women and elderly) which will ensure protection by notifying the user's associates of any kind of danger the user is in.

INTRODUCTION

The need for women safety is increasing day by day, be it offline or online. There are various online applications and initiatives developed for this purpose. Using access to basic phone features like contact list, GPS, SMS etc, these apps allow you to send a distress message to your trusted contacts, let them know your location, directly call the police helpline, etc. In the previous couple of years, the security of ladies in India has been down a direct result of some constant and awful wrongdoings against ladies. There has been decrease in the ladies status from antiquated to medieval period which is proceeded in such a propelled time. Ladies of India have meet rights as like as men of this nation as they possess half populace of the nation and associated with half extent in the development and advancement of the nation. .

Number of ladies heading the family units in India is discovered diminished however female proficiency rate is still not exactly male education rate. Urban young ladies are about equivalent in training like young men anyway in the country regions there is as yet a major hole. Then again, some Indian states (like Kerala and Mizoram) have accomplished widespread female proficiency. Along these lines, ladies in such states have high social and monetary status. Ladies education rate in India is still less as a result of the insufficient school offices, clean offices, expanding violations against ladies, deficiency of female instructors, sex separation in the general public, and so on. As indicated by the measurements of 2015, it is discovered that ladies (over 15 years or more established) proficiency rate is 60.6% while male education rate is 81.3%.

There is a big list of crimes against women in India such as acid attack, child marriages, domestic violence, forceful domestic work, child abuse, dowry deaths, female infanticide and sex-selective abortions, child labour, honor killings, rape, sexual harassment, trafficking, forced for prostitution, and many more.

There is a rundown of wellbeing laws for ladies in India working in the field to give security to the ladies from all kind of wrongdoings against ladies. Some wellbeing laws are Child

Marriage Restraint Act 1929, Special Marriage Act 1954, Hindu Marriage Act 1955, Hindu Widows Remarriage Act 1856, Indian Penal Code 1860, Dowry Prohibition Act 1961, Maternity Benefit Act 1861, Foreign Marriage Act 1969, Indian Divorce Act 1969, Medical Termination of Pregnancy Act 1971, Christian Marriage Act 1872, Code of Criminal Procedure 1973, Equal Remuneration Act 1976, Married Women's Property Act 1874, Births, Deaths and Marriages Registration Act 1886, Indecent Representation of Women (Prevention) Act 1986, Muslim ladies (assurance of rights on separation) Act 1986, Commission of Sati (Prevention) Act 1987, National Commission for Women Act 1990, Prohibition of Sex Selection Act 1994, Protection of Women from Domestic Violence Act 2005, Prevention of Children from Sexual Offenses Act 2012, Sexual Harassment of Women at Work Place Act 2013, and so forth.

Another Juvenile Justice (Care and Protection of Children) Bill, 2015 has been passed supplanting the current Indian adolescent misconduct law of 2000 (Juvenile Justice (Care and Protection of Children) Act, 2000). This demonstration was passed by the Lok Sabha on seventh of May in 2015 and in any case, by the Rajya Sabha on 22nd of December in 2015. This demonstration is passed to let down the adolescent age from 18 to 16 years in instances of grievous offense (**particularly after the arrival of Nirbhaya's case blamed adolescent**).

In spite of arrangement of different compelling standards and directions by the Indian government to deal with and control the wrongdoings against ladies, the number and recurrence of violations against ladies are expanding step by step. Ladies status in the nation has been more hostile and frightful over the most recent couple of years. It has diminished the certainty level of ladies for wellbeing in their very own nation. Ladies are in far fetched condition for their security and have fear while going anyplace else outside their home (office, showcase, and so on). We ought not accuse the administration since ladies wellbeing isn't just the duty of government just, it is the obligation of every single Indian subject particularly men who need to alter their opinion set for ladies.

In a quick changing society like our own, security of ladies is a decent metric of how well we are dealing with our social change. Proactive advances are required in different regions and at various levels desperately. Sexual orientation touchy foundation offices, overwhelming endeavors to improve mindfulness and solid administrative and legal frameworks are the foundation of any such exertion. We have to raise and heighten talks on the security of ladies and youngsters to the most elevated amount with the goal that we compensate for a

considerable length of time of disregard, to change ourselves into a main society and economy. A mix of technology and innovation is needed to provide the safety and security to the women. Our proposed device ensures to provide safety to the women on just a press of button. The device is a wearable shoe which enables the victim to get the help in the situations of any kind of attack or misconduct.

ABSTRACT

Today, in the current global scenario, Women were facing lot of challenges. We can hear the news of women harassments than their achievements. There are many existing apps and devices for women security via smart phones. Though the smart phones have increased rapidly, it is not possible to have the phone all the time in our hand to make a call or click on it, so here we introduced a new technique via smart shoes.

When the user is wearing this, and is exposed to sexual or vulnerable attack, the user presses a button and automatically notifies the registered contact and through which it will send the location of herself and the nearby spots for help. This will ensure a safer and better environment.

LITERATURE SURVEY

TITLE	YEAR OF PUBLIC ATION	SUMMARY
A Novel Approach to Provide Protection for Women by using Smart Security Device	2018	This paper portrays about safe and anchored electronic framework for ladies which contains an Arduino controller and sensors, for example, temperature LM35, flex sensor, MEMS accelerometer, beat rate sensor, sound sensor. A signal, LCD, GSM and GPS are utilized in this undertaking. At the point when the ladies is in risk, the gadget detects the body parameters like heartbeat rate, change in temperature, the development of unfortunate casualty by flex sensor, MEMS accelerometer and the

		voice of the injured individual is detected by sound sensor. At the point when the sensor crosses as far as possible the gadget gets enacted and follows the area of the unfortunate casualty utilizing the GPS module. By utilizing the GSM module the injured individual's area is sent to the enlisted contact number.
Design Of A Women Safety Device	2016	The barrier procedure utilized by females should be reformed by receiving present day innovation and devices to shield them from their oppressor. This gadget is a response to every one of the ladies who merit a sheltered and secure world.
Smart Foot Device for Women Safety	2016	In this paper, an endeavor has been made to build up a keen gadget that can help ladies when they feel hazardous. This keen gadget will be cut to the footwear of the client and can be activated attentively. On tapping one foot behind the other multiple times, an alarm is sent by means of Bluetooth Low Energy correspondence to an application on the injured individual's telephone, modified to produce a message looking for help with the area of the gadget connected. The outcomes acquired were broke down utilizing Naïve Bayes classifier and this minimal effort gadget demonstrated a general exactness of 97.5%.
Design and Implementation of a Rescue System for Safety of Women	2016	There is in this way, a need of less complex security arrangement that can be initiated as basically as by squeezing a switch and can in a flash convey alarms to the close to ones of the person in question. In this paper it is proposed to structure and actualize such a framework as a fractional wearable and incomplete compact framework.
Smart Security Solution for Women based on Internet Of	2016	This paper proposes another point of view to utilize innovation for ladies wellbeing. "848 Indian Women Are Harassed, Raped, Killed Every Day!!" That's a route past HUGE number! We propose a thought which changes the

Things(IOT		way everybody contemplates ladies security. Multi day when media communicates a greater amount of ladies' accomplishments instead of provocation, it's an accomplishment accomplished! Since we (people) can't react apropos in basic circumstances, the requirement for a gadget which naturally faculties and salvages the injured individual is the endeavor of our thought in this paper. We propose to have a gadget which is the joining of numerous gadgets, equipment includes a wearable "Keen band" which constantly speaks with Smart telephone that approaches the web. The application is modified and stacked with all the required information which incorporates Human conduct and responses to various circumstances like indignation, dread and nervousness. This creates a flag which is transmitted to the PDA. The product or application approaches GPS and Messaging administrations which is pre-customized so that at whatever point it gets crisis flag, it can send help ask for alongside the area co-ordinates to the closest Police station, relatives and the general population in the close span who have application. This activity empowers help promptly from the Police and Public in the close span who can achieve the unfortunate casualty with incredible precision.
HearMe: A Smart Mobile Application for Mitigating Women Harassment	2016	In this paper, a gadget is build up, to be specific HearMe, with different one of a kind highlights including lock screen access and moment alarm on the beneficiary gadget. The modules of HearMe application can be gotten to through equipment catches with the end goal to encourage brisk access to the injured individual lady. Another imperative component of HearMe is to blow an uproarious alarm at the beneficiary gadget regardless of whether the portable is in quiet mode, expanding the

		unwavering quality of getting assistance from the relatives or hospital police station work force.
Prototype of an Intelligent System based on RFID and GPS Technologies for Women Safety	2016	The primary thought here is utilizing a functioning RFID tag with inactive RFID per user to filter the data and this data is exchanged to the AT89C52 microcontroller where in the contacts of around 4 to 5 individuals is put away in the information base. When the data is gotten by the controller, it sends the message to the contacts through GSM module and the area is followed through the GPS. The simulation is done in ISIS proteus.
Design and Development of an IOT based wearable device for the Safety and Security of women and girl children	2016	The point of this work is to build up a wearable gadget for the wellbeing and security of ladies and young ladies. This goal is accomplished by the investigation of physiological flags related to body position. The physiological signs that are examined are galvanic skin opposition and body temperature. Body position is controlled by securing crude accelerometer information from a triple pivot accelerometer. Obtaining of crude information is then trailed by movement acknowledgment which is a procedure of utilizing a particular machine learning calculation. Constant checking of information is accomplished by remotely sending sensor information to an open source Cloud Platform. This gadget is modified to consistently screen the subject's parameters and make a move when any hazardous circumstance presents itself. It does as such by recognizing the adjustment in the checked signs, following which fitting move is made by methods for sending warnings/cautions to assigned person

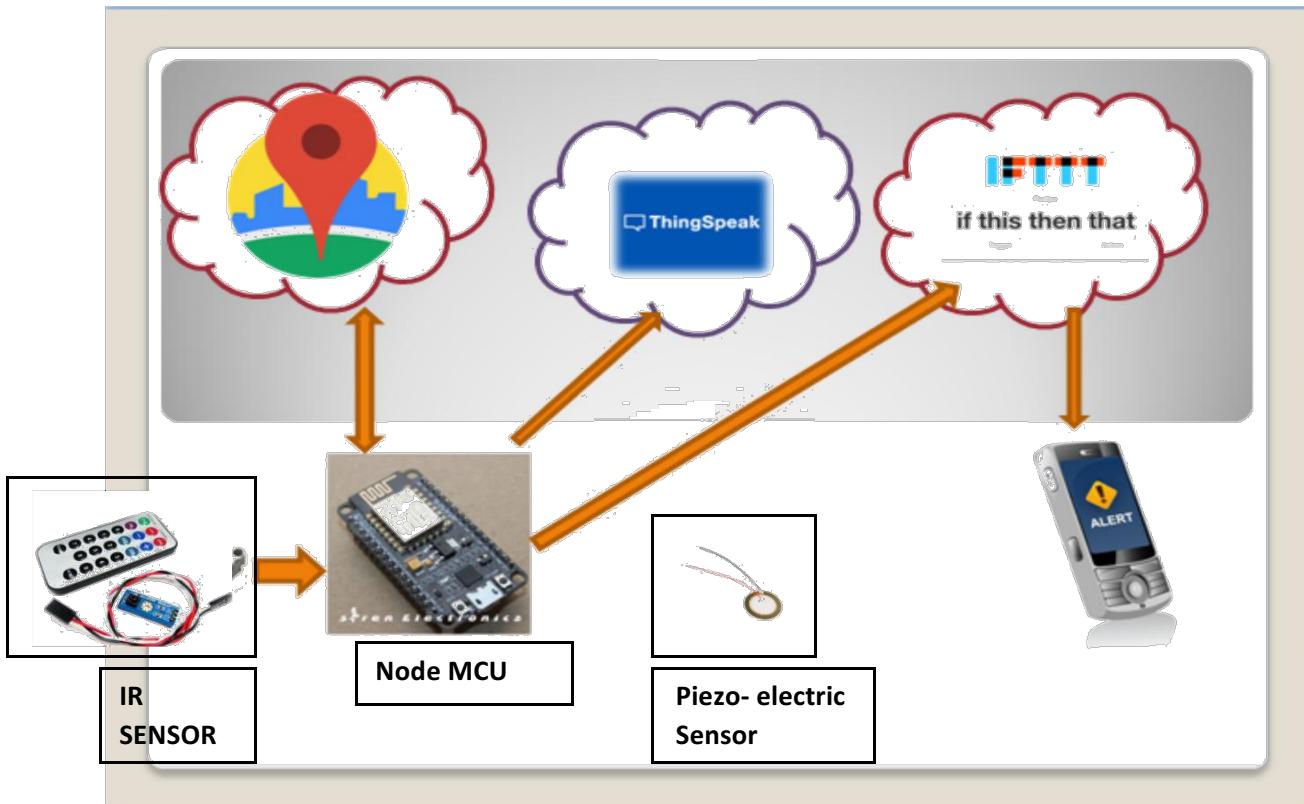
COMPONENTS USED

1. Node MCU
2. An IR Sensor With a Remote (AX 1838 HS)
3. Piezo -Electric Sensor
4. Jumper Wires(M to M and M to F)
5. ESP2866 Wi-Fi Module
6. Potentiometer
7. Resistance 1000 ohm
8. Bread Board
9. Capacitor
10. LED

Software Tools Used

1. Arduino IDE
2. Google Cloud Services
3. ThinkSpeak Servers to store Data
4. IFTTT Services

DIAGRAM WORKFLOW OF THE DEVICE



METHODOLOGY

This type of an idea being the first of its kind plays a crucial role towards ensuring safety in the fastest way possible automatically. The proposed design will deal with critical issues faced by women and elderly in the recent past and will help solve them through technologically sound gadgets.

Our project consist of IR Sensor, remote, node MCU, Google location, ThingSpeak and IFTTT API. Here the user is provided with a remote. In any critical situation, if the user presses any button on the remote, it will send an infrared signal to the IR sensor in the coded form. The IR Sensor in this case is stitched onto the lower sole of the user's shoes. The sensor is placed in a way to ensure least contact with any external material like water or mud. Now, the signal is received by the IR Sensor and is fed into the Node MCU. This is capable of actively scanning for nearby Wi-Fi access points operating in the 2.4GHz band. Once a secure connection is established and the defined parameters are sent , the data is then consolidated into a data block that must be sent to an online geolocation API or service that will estimate the device location in terms of latitude, longitude and accuracy of the fix. This data is collected back on to the Node MCU module. Now the data is uploaded onto the Thing Speak cloud server. ThingSpeak is an IoT analytics cloud platform service that allows users to aggregate, visualize and analyze live data streams in the cloud. ThingSpeak provides instant visualizations of data posted by Node MCU to ThingSpeak. We can use this data to act and analyze on them with the help of the graphs. It also ensures when the system was working or not.

The location data is packed in the form of a message which is send as an emergency message to the victim's associates using the IFTTT API. Here, IFTTT(If This Then That) is a free web-based service that helps you connect all of your different apps and devices. For every trigger or the most recent event(button press), an applet is created and the data is sent to the phone. The frequency of this depends on the frequency of the events taking place, but the trigger wouldn't take more than 15 minutes thus in this case ensuring safety as quickly possible.

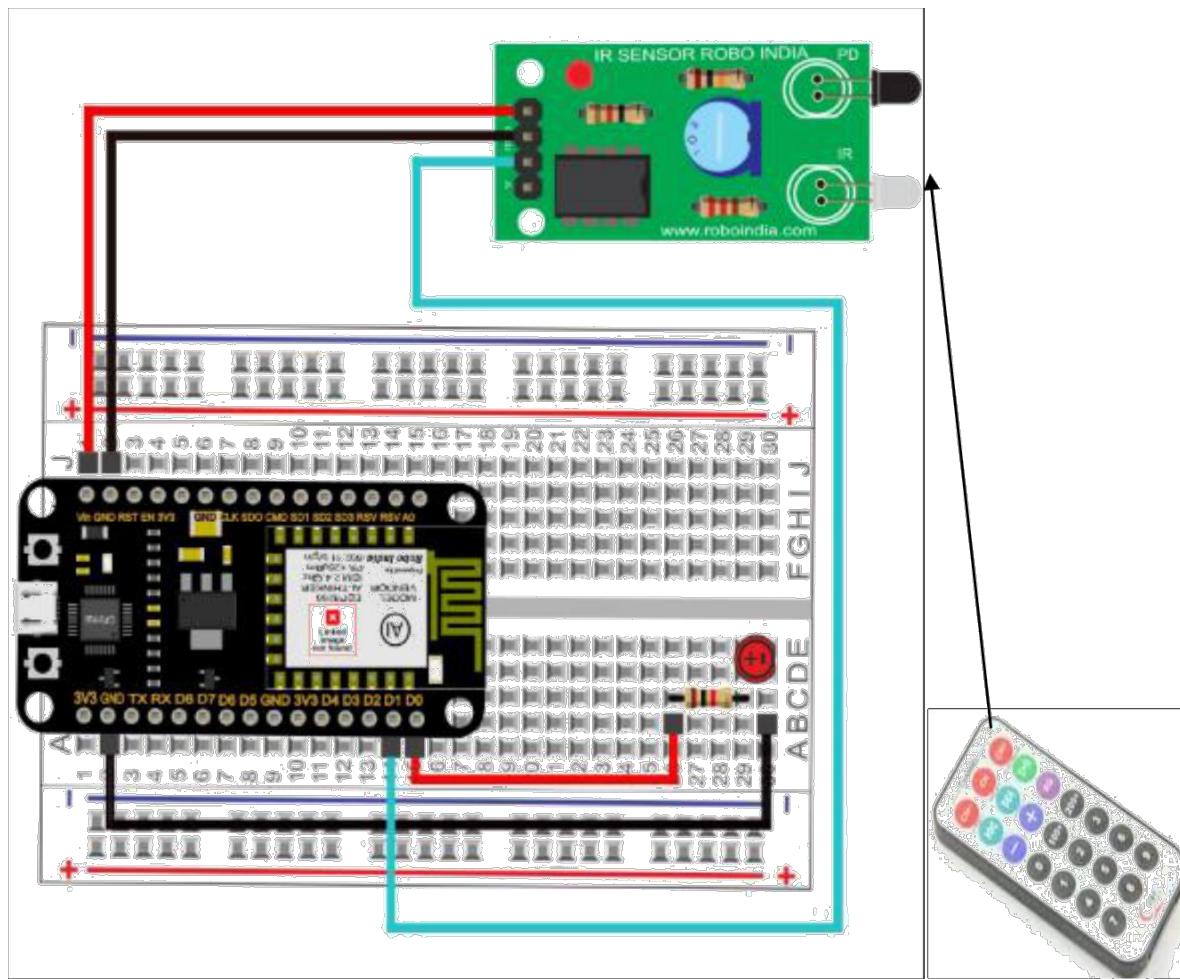
Once the associates are informed about the victims 's location along with a custom message like " HELP", the location can be tracked down and the victim thus can be helped out in times of need.

IMPLEMENTATION

Circuit Diagram

The Node MCU connected to the IR sensor:

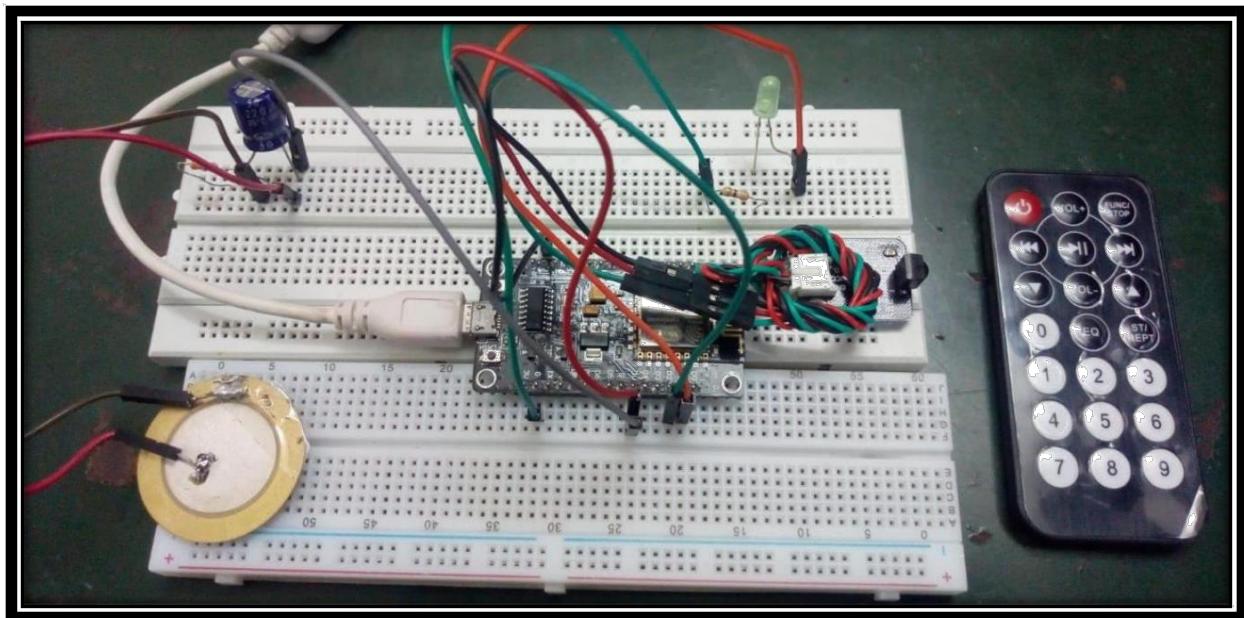
S.No.	IR Sensor	Node MCU
1.	VCC	Vin
2.	GND	GND
3.	D	D1 (When IR Pair use as Digital Sensor)
4.	A	A0 (When IR Pair use as Analog Sensor)



The hardware and software requirements of the project has already been discussed in previous sections along with the pin diagrams of both the IR sensor and the Node MCU.

The electronic circuits in the project are show below:

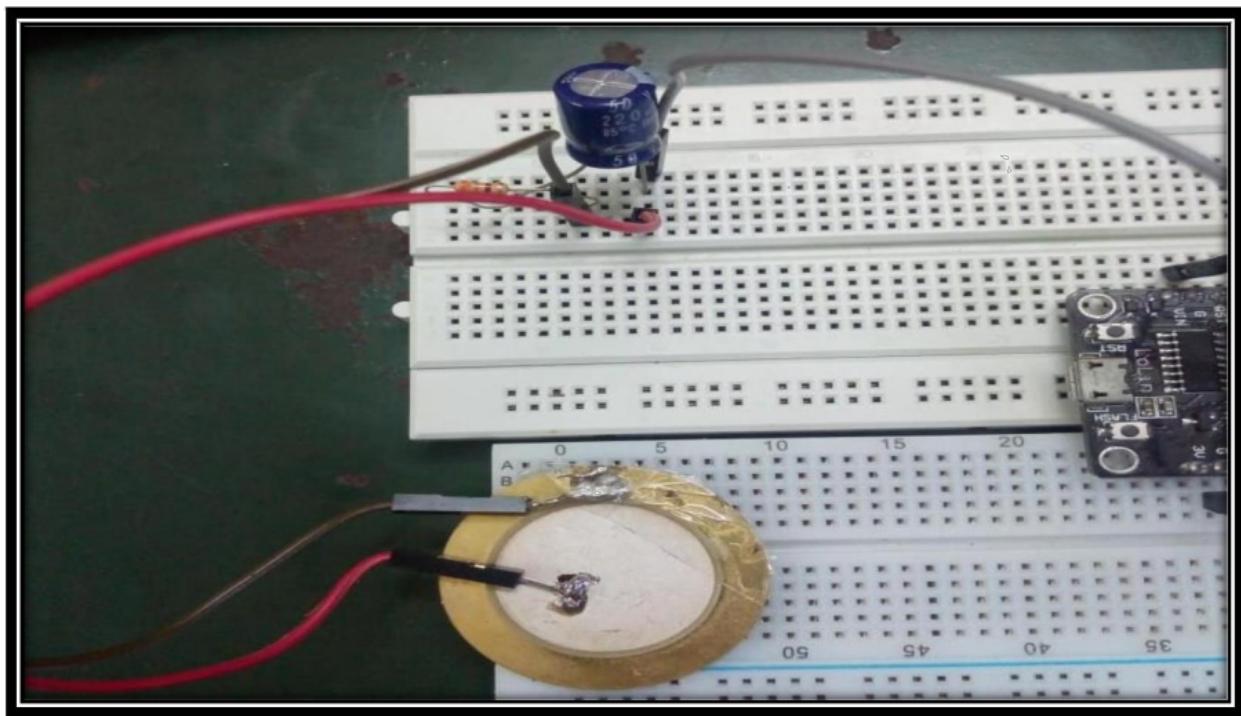
Screenshots of Our own Circuit



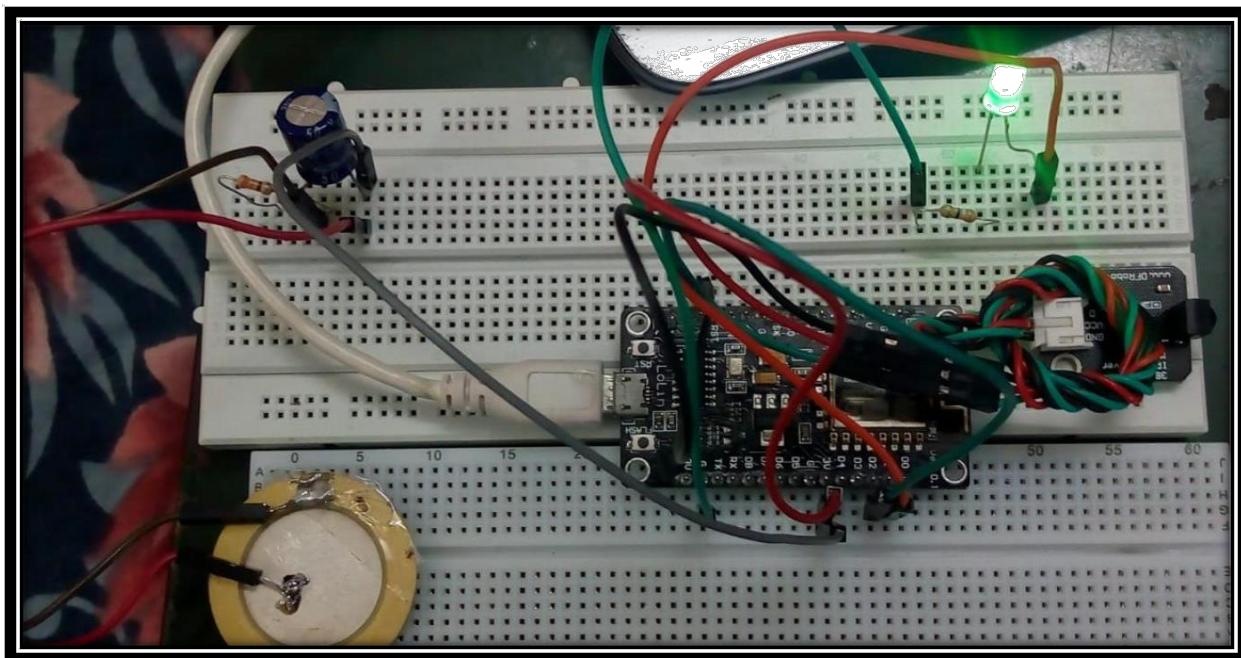
1. Complete Kit



2. The Reciever Trasmitter (IR Sensor)



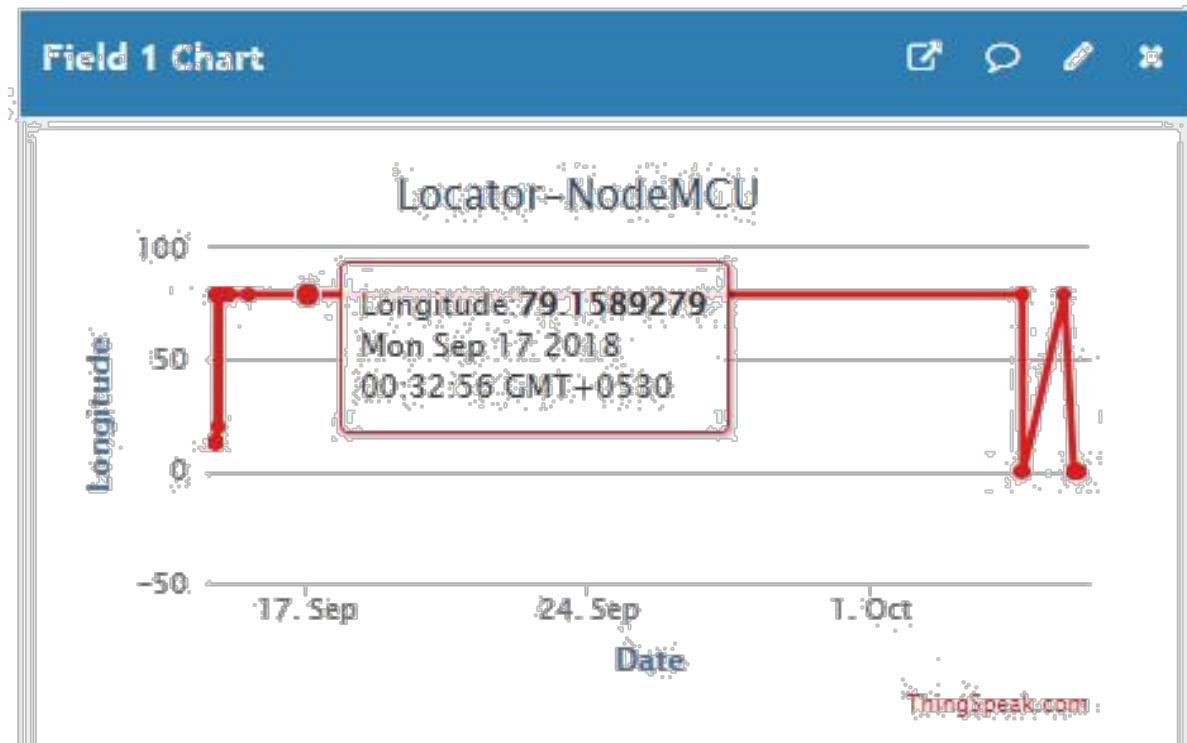
3. The Piezo Sensor to store energy to use in future use



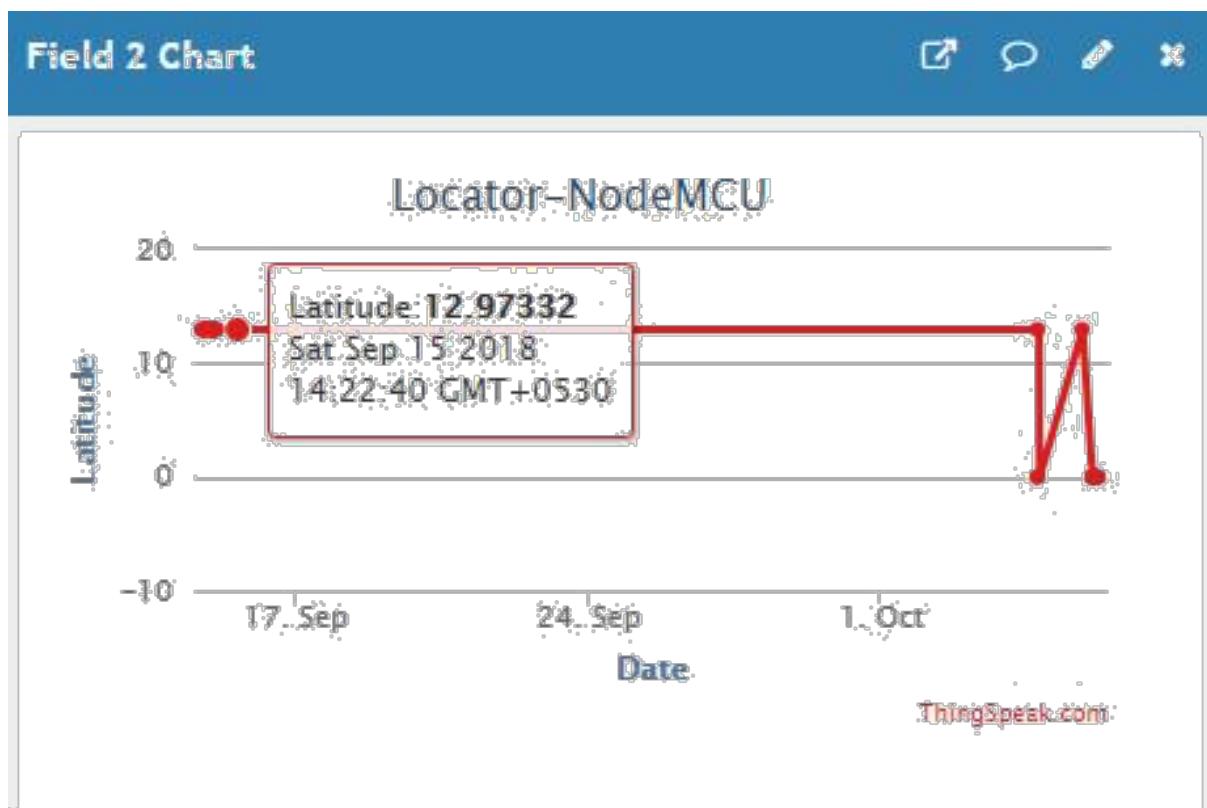
4. The Working Kit with Glowing LED

ThinkSpeak Charts where Data is stored

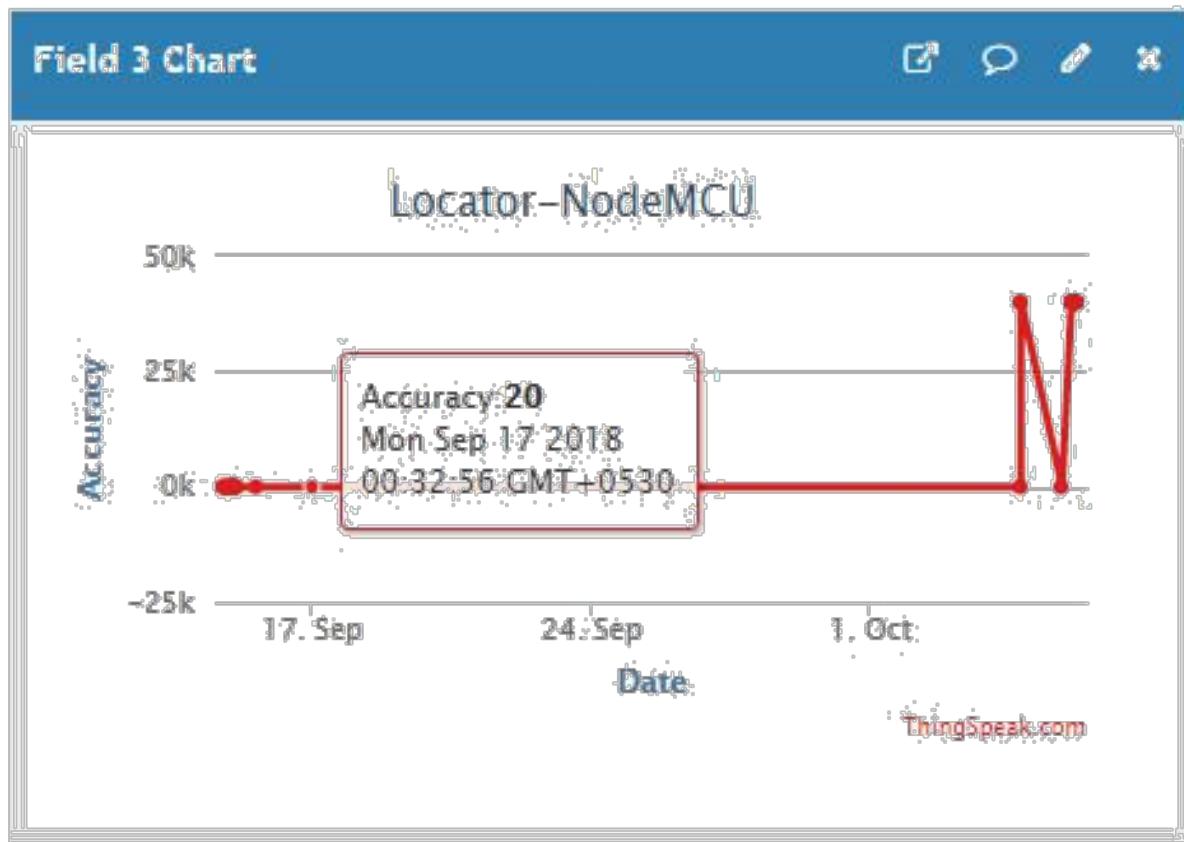
Longitude Measures



Latitude Measures



Accuracy Measures



IFTTT Dashboard

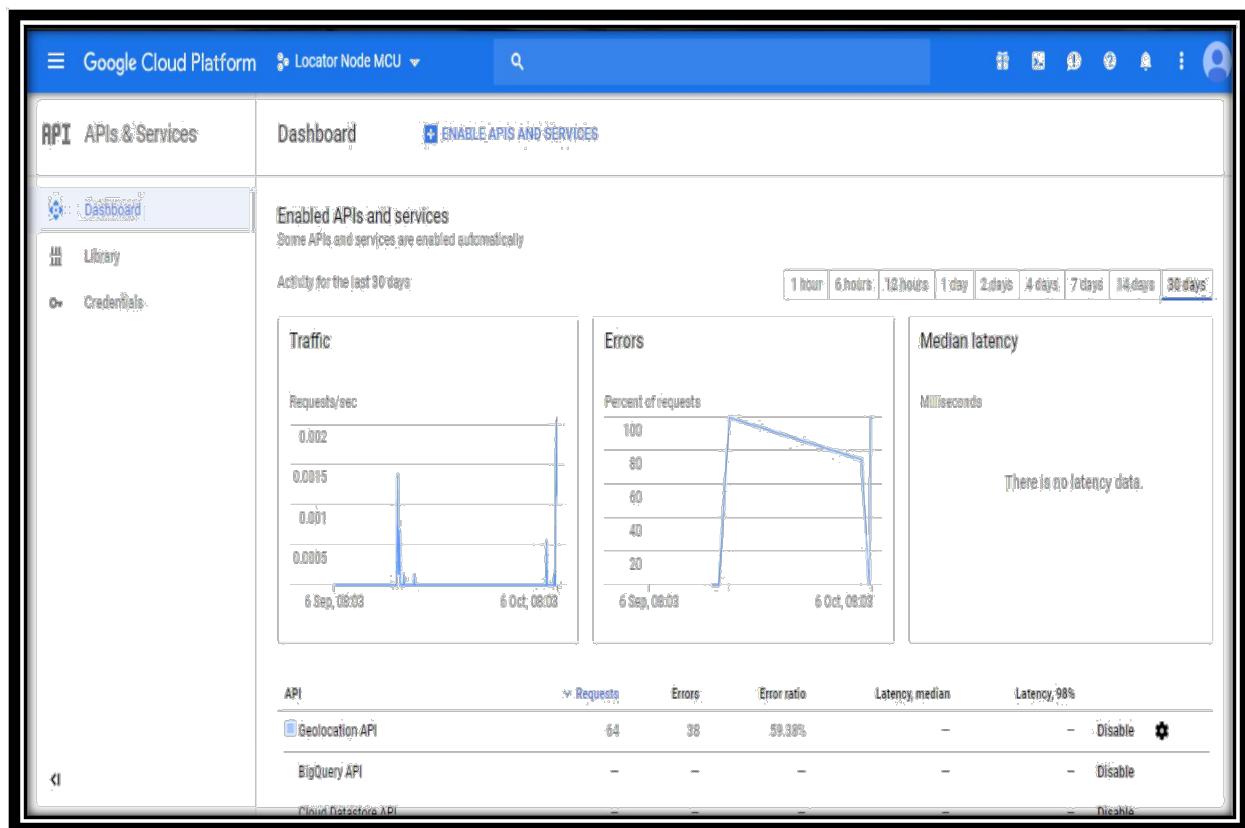
IFTTT

My Applets Activity Search

Applets Services

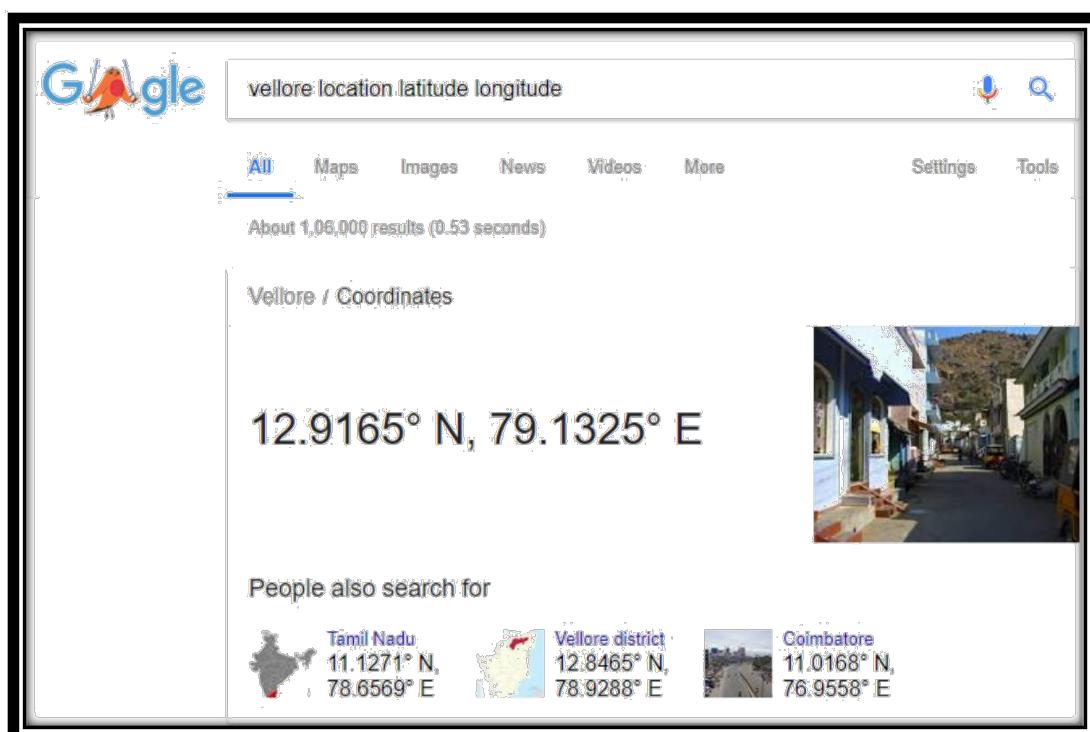
The IFTTT dashboard displays two applets. The first applet, titled 'If Maker Event "SMS", then Send an SMS to {{Value1}}', is triggered by a 'Maker Event "SMS"' and sends an SMS message to a recipient whose value is stored in {{Value1}}. It is currently 'On' and works with a mobile phone service. The second applet, titled 'Get an email with the latest IFTTT updates', triggers an email whenever there are new updates. It is also currently 'On' and works with both an RSS feed and an email service. The dashboard includes tabs for 'Applets' and 'Services'.

Google Cloud Console

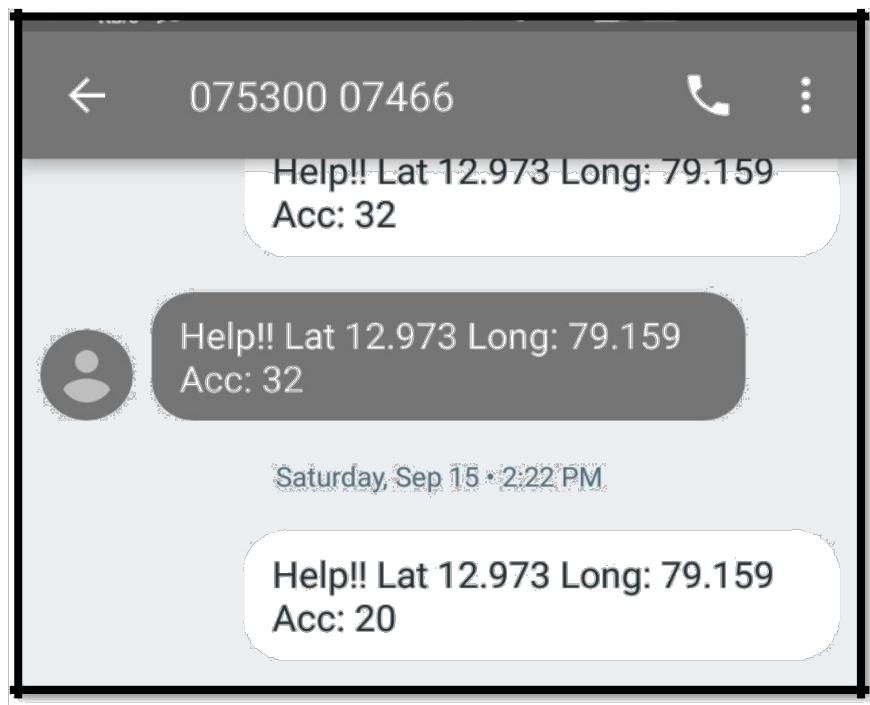


PERFORMANCE MEASURES GENERATED DURING TESTS

Figures below show the Googled Images of location of VIT campus



This figure illustrates the received message from the device on the phone.



RESULT & CONCLUSION

Since we (humans) can't respond aptly in critical situations, the need for a device which automatically senses and rescues the victim is the venture of our idea in this project. We propose to have a safety footwear .The application is programmed and loaded with all the required data which includes Human behavior and reactions to different situations like anger, fear and anxiety. This generates a signal which is transmitted to the smart phone. The software or application has access to GPS and Messaging services which is pre-programmed in such a way that whenever it receives emergency signal.

Also, the shoes can be further integrated with other components for charging any kind of device while on the move – as the energy of our movement can be converted to electrical energy. With further research and innovation, this project can be implemented in different areas of security and surveillance. The system can be used perform the real time monitoring of desired area and with collected data it can detect the violence with a good accuracy. We propose a work which changes the way everyone thinks about safety – also because there is just one press of button is needed notify the danger, the safety shoe will give more time for the victim to react to the danger.

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1maha3.madhu@rediffmail.com, 2ktvreddy@gmail.com, 3rajputmanita@yahoo.com
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- [7] Prototype of an Intelligent System based on RFID and GPS Technologies for Women Safety Shaik Mazhar Hussain¹, Shaikh Azeemuddin Nizamuddin², Rolito Asuncion³, Chandrashekhar Ramaiah⁴, Ajay Vikram Singh⁵
- [8] Design and Development of an IOT based wearable device for the Safety and Security of women and girl children, AnandJatti, MadhviKannan , Alisha RM, Vijayalakshmi P, ShresthaSinha
- [9] Arduino forum – <http://forum.arduino.cc>

APPENDIX

Arduino Code:

```
#include <IRrecv.h>
#include <IRremoteESP8266.h>
#include <IRsend.h>
#include <IRtimer.h>
#include <IRutils.h>
#include <ir_Argo.h>
#include <ir_Daikin.h>
#include <ir_Fujitsu.h>
#include <ir_Gree.h>
#include <ir_Haier.h>
#include <ir_Kelvinator.h>
#include <ir_LG.h>
#include <ir_Magiquest.h>
#include <ir_Midea.h>
#include <ir_Mitsubishi.h>
#include <ir_Toshiba.h>
#include <ir_Trotec.h>

#define Button_1 0xFD30CF
#define Button_2 0xFD08F7
int receiver = 4; //initialize pin 13 as receiver pin.
int ledpin = 5; // D1(gpio5)
```

```

uint32_t Previous;

IRrecv irrecv(receiver); //create a new instance of receiver
decode_results results;

#include <ESP8266WiFi.h>
#include <ESP8266HTTPClient.h>
WiFiClient client;
String thingSpeakAddress= "http://api.thingspeak.com/update?";
String writeAPIKey;
String tsfield1Name;
String request_string1;
String messageString;
HTTPClient http1;

#ifndef ARDUINO_ARCH_SAMD+
#include <WiFi101.h>
#elif defined ARDUINO_ARCH_ESP8266
//#include <ESP8266WiFi.h>
#elif defined ARDUINO_ARCH_ESP32
#include <WiFi.h>
#else
#error Wrong platform
#endif

#include <WifiLocation.h>

const char* googleApiKey =
"AIzaSyBswuDCyJqfCxdtEsHrc_2pLC4q1pqYic";
const char* ssid = "$Hubham";

```

```

const char* passwd = "122333444";

WifiLocation location("AIzaSyBswuDCyJqfCxdwtEsHrc_2pLC4q1pqYic");

String MakerIFTTT_Key ;
:String MakerIFTTT_Event;

char *append_str(char *here, String s) { int i=0; while (*here++ = s[i]) {i++;};return here-1; }

char *append_ul(char *here, unsigned long u) { char buf[20]; return append_str(here, ultoa(u, buf, 10)); }

char post_rqst[256];char *p;char *content_length_here;char
*json_start;int compi;

//int ledpin = 5; // D1(gpio5)
//int button = 4; //D2(gpio4)
//int buttonState=0;

void setup()
{
    pinMode(ledpin, OUTPUT);
    // pinMode(button, INPUT);
    // Serial.begin(9600);
    Serial.begin(9600);
    irrecv.enableIRIn(); //start the receiver
}

}

```

```

void loop()
{
    if(irrecv.decode(&results)) { //if we have received an IR signal
        if(results.value==0xFFFFFFFF) {
            results.value=Previous;
        }

        switch(results.value) {
            case Button_1 :{
                // digitalWrite(5, HIGH);

                digitalWrite(ledpin, HIGH);
                delay(200);
                // Serial.println("LOW");

                #ifdef ARDUINO_ARCH_ESP32
                    WiFi.mode(WIFI_MODE_STA);
                #endif

                #ifdef ARDUINO_ARCH_ESP8266
                    WiFi.mode(WIFI_STA);
                #endif

                WiFi.begin(ssid, passwd);
                while (WiFi.status() != WL_CONNECTED) {
                    Serial.print("Attempting to connect to WPA SSID: ");
                    Serial.println(ssid);
                    Serial.print("Status = ");
                    Serial.println(WiFi.status());
                }
            }
        }
    }
}

```

```

    delay(500);

}

Serial.println("I am connected");
Serial.println("Your IP is");
Serial.println((WiFi.localIP()));

location_t loc = location.getGeoFromWiFi();

Serial.println("Location request data");
Serial.println(location.getSurroundingWiFiJson());
Serial.println("Latitude: " + String(loc.lat, 7));
Serial.println("Longitude: " + String(loc.lon, 7));
Serial.println("Accuracy: " + String(loc.accuracy));

messageString = String("Help!! ") + String("Lat ") + String(12.971/*loc.lat,
3*)+ String(" Long: ") + String(79.164/*loc.lon, 3*)+ String(" Acc: ")+
String(20/*loc.accuracy*/);

Serial.println(messageString);

if (client.connect("maker.ifttt.com",80))
{ // Serial.println("In IF");
  MakerIFTTT_Key
="kjoMotyTLo9gSMpzx0OqqpuQvOIHhYEVZsLZRCuiuI-";
  MakerIFTTT_Event ="SMS";
  p = post_rqst;
  p = append_str(p, "POST /trigger/");
  p = append_str(p, MakerIFTTT_Event);
}

```

```

p = append_str(p, "/with/key/");
p = append_str(p, MakerIFTTT_Key);
p = append_str(p, " HTTP/1.1\r\n");
p = append_str(p, "Host: maker.ifttt.com\r\n");
p = append_str(p, "Content-Type: application/json\r\n");
p = append_str(p, "Content-Length:");
"); content_length_here = p;
p = append_str(p, "NN\r\n");
p = append_str(p, "\r\n");
json_start = p;
p = append_str(p, "{\"value1\":\"");
p = append_str(p, "917530007466");
p = append_str(p, "\",\"value2\":\"");
p = append_str(p, messageString); p
= append_str(p, "\",\"value3\":\"");
p = append_str(p, "");
p = append_str(p, "}");
compi= strlen(json_start);
content_length_here[0] = '0' + (compi/10);
content_length_here[1] = '0' +
(compi%10); client.print(post_rqst);
// Serial.println("If Ends");
}
if(client.connect("api.thinkspeak.com",80))
{
//longitude
request_string1 = thingSpeakAddress;

```

```

request_string1 += "key=";
request_string1 += "SF9TJIIA136JVZFT";
request_string1 += "&";
request_string1 += "field1";
request_string1 += "=";
request_string1 += (String(loc.lon, 7));
request_string1 += "&";
request_string1 += "field2";
request_string1 += "=";
request_string1 += (String(loc.lat, 7));
request_string1 += "&";
request_string1 += "field3";
request_string1 += "=";
request_string1 += (String(loc.accuracy));
http1.begin(request_string1);
http1.GET();
http1.end();
delay(500);
Serial.println("1 Done");
}

break; }

//      case Button_2 : digitalWrite(5, LOW); break;

}

// Serial.println (results.value, HEX); //display HEX
results irrecv.resume(); //next value
}

```

```
Previous=results.value;  
digitalWrite(ledpin, LOW);  
}
```