PSG COLLEGE OF TECHNOLOGY

COIMBATORE – 641 004

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

15Z610-EMBEDDED SYSTEMS LABORATORY

REPORT

TOPIC: WOMEN SAFETY SYSTEM WITH GPS

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FEBRAURY 2020

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I.INTRODUCTION

Women safety is very important issue due to rising crimes against women these days. To help resolve this issue, a GPS based women safety system is proposed that has dual security feature. This device consists of a system that ensures dual alerts in case a women is harassed or she thinks she is in trouble. This system can be turned on by a woman even if she thinks she would be in trouble. It is useful because once an incident occurs she may get the chance to press the emergency button.

II.PROBLEM STATEMENT

This project presents a women safety detection system using GPS. The system can be interconnected with the WIFI MODULE and software and alert the neighbours. This detection and messaging system is composed of a GPS receiver and Microcontroller. GPS Receiver get the location information from satellites in the form of latitude and longitude.

III.DESCRIPTION

ESP 8266 WIFI MODULE

The ESP8266 is a self-contained SOC (system on a chip) with integrated TCP/IP protocol stack that can give any microcontroller access to your WI-FI network .The ESP8266 is capable of either hosting an application or offloading all WI-FI networking functions from another application processor.

Fig.1. ESP 8266 WIFI module

GOLBAL POSITIONING SYSTEM (GPS)

A GPS module is a device that uses global positioning system to determine the location of a vehicle or person. GPS receivers are used to provide reliable navigation, positioning and timing services to the users at time and anywhere on the earth. To find the exact GPS latitude and longitude coordinates of a point on a map along with the altitude above the sea level.

Fig.2. GPS module

IV.COMPONENTS REQUIRED

HARDWARE AND SOFTWARE

- ESP 8266 microcontroller
- GPS module
- ON / OFF switch
- Jumper Wires
- Bread Board
- Fritzing

V.SCHEMANTIC DIAGRAM

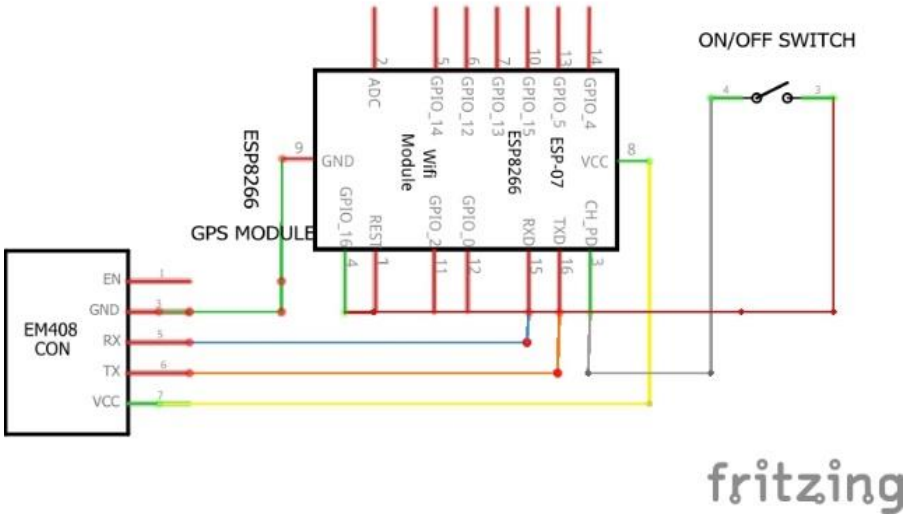

Fig.3.schemantic diagram

VI.CODE

```
include <TinyGPS++.h>
#include <SoftwareSerial.h> \\ allow serial communication on other digital pins.
#include <ESP8266WiFi.h> \\ standard  arduino Wi-Fi library used for Wi-Fi shield
int p=16;

TinyGPSPlus gps;  \\ library for parsing data streams provided by GPS module

SoftwareSerial ss(4, 5);


char ssid[] = "sss";
char pass[] = "12345678@";



float latitude , longitude;
String date_str , time_str , lat_str , lng_str;
into pm;

WiFiServer server(80);
void setup()
{
  Serial.begin(9600); \\ setting the baud rate of serial monitor
  ss.begin(9600);
  Serial.println();
  pinMode(p,INPUT);

  server.begin();
  Serial.println("Server started");

  Serial.println(WiFi.localIP());

}

void loop()
{

  while (ss.available() > 0)
    if (gps.encode(ss.read())) \\ simple create instance object
    {
      if (gps.location.isValid()) \\ determining a positions
      {
```

```
  latitude = gps.location.lat(); \\ determining the locations
  lat_str = String(latitude , 6);
  longitude = gps.location.lng();
  lng_str = String(longitude , 6);
}

if (gps.date.isValid())
{
  date_str = "";
  date = gps.date.day();
  month = gps.date.month();
  year = gps.date.year();

  if (date < 10)
    date_str = '0';
  date_str += String(date);

  date_str += " / ";

  if (month < 10)
    date_str += '0';
  date_str += String(month);

  date_str += " / ";

  if (year < 10)
    date_str += '0';
  date_str += String(year);
}

if (gps.time.isValid())
{
  time_str = "";
  hour = gps.time.hour();
  minute = gps.time.minute();
  second = gps.time.second();

  minute = (minute + 30);
  if (minute > 59)
  {
    minute = minute - 60;
    hour = hour + 1;
  }
  hour = (hour + 5) ;
```

```
      if (hour > 23)
        hour = hour - 24;

      if (hour >= 12)
        pm = 1;
      else
        pm = 0;

      hour = hour % 12;

      if (hour < 10)
        time_str = '0';
      time_str += String(hour);

      time_str += " : ";

      if (minute < 10)
        time_str += '0';
      time_str += String(minute);

      time_str += " : ";

      if (second < 10)
        time_str += '0';
      time_str += String(second);

      if (pm == 1)
        time_str += " PM ";
      else
        time_str += " AM ";
    }

  }
 WiFiClient client = server.available();
 if (!client)
 {
   return;
 }

  String s = "HTTP/1.1 200 OK\r\nContent-Type: text/html\r\n\r\n <!DOCTYPE html> <html>
<head> <title>GPS Interfacing with NodeMCU</title> <style>";
 s += "a:link {background-color: YELLOW;text-decoration: none;}";
 s += "table, th, td {border: 1px solid black;} </style> </head> <body> <h1  style=";
 s += "font-size:300%;";
```

```
  s += " ALIGN=CENTER> GPS Interfacing with NodeMCU</h1>";
  s += "<p ALIGN=CENTER style=""font-size:150%;""";
  s += "> <b>Location Details</b></p> <table ALIGN=CENTER style=";
  s += "width:50%";
  s += "> <tr> <th>Latitude</th>";
  s += "<td ALIGN=CENTER >";
  s += lat_str;
  s += "</td> </tr> <tr> <th>Longitude</th> <td ALIGN=CENTER >";
  s += lng_str;
 </tr> </table> ";


  if (!gps.location.isValid())
  {
     s += "<p align=center><a style=""color:RED;font-size:125%;""
href=""http://maps.google.com/maps?&z=15&mrt=yp&t=k&q=";
    s += lat_str;
    s += "+";
    s += lng_str;
    s += """ target=""_top"">Click here!</a> To check the location in Google maps.</p>";
  }

  s += "</body> </html> \n";

  client.print(s);
  delay(100);

}
void send()
{
 myMap.location(2, lat_str,lng_str,"*");
}
```

OUTPUTS

192.168.43.93

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GPS Interfacing with NodeMCU

Location Details

Latitude	11.024587
Longitude	77.002541 Click here! To check the location in Google maps.

Fig.4.output

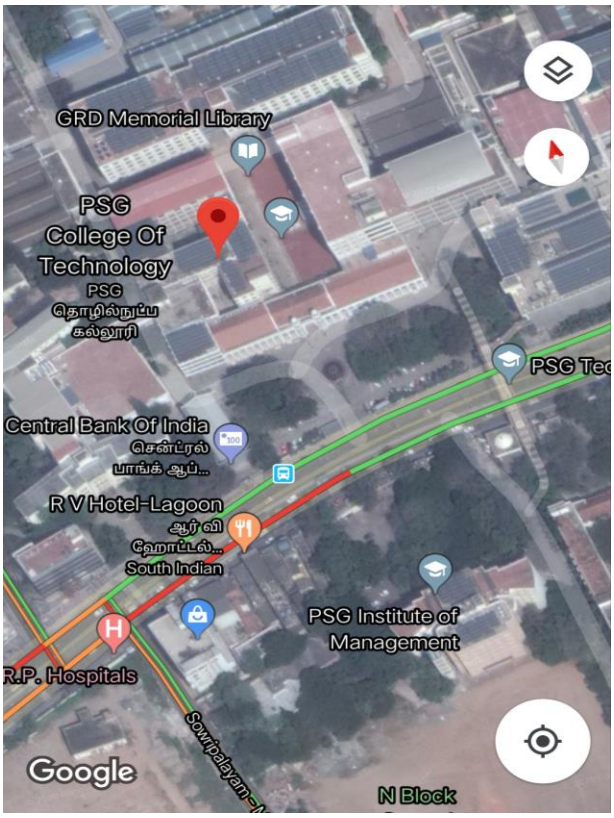

Fig.5. Tracking the location

VI.CHALLENGES FACED

- High Power Dissipation of Embedded System
- Problem of Testing an Embedded System Design.

VII.CONTRIBUTION OF TEAM MEMBERS

G. Elakkiya (18Z464) - Implementing the hardware, software and report

M.R.Ramya (18Z472) - Implementing the hardware, software and report

VIII.REFERENCES

- Fong, T., Nourbakhsh, I., & Dautenhahn, K. (2003). A survey of socially interactive robots. Robotics and autonomous systems, 42(3), 143166.
- Shubham Oulkar Ram Baman Sagar Gulave and Pravin Kothawale. IFTT, MQTT CONTROLLED HOME AUTOMATION USING ESP8266.International Journal of Recent Innovation in Engineering and Research.
- https://www.nodemcu. org/
- Home Automation using ESP8266 Wi-Fi Development Board Ashwin P Ajith1 , Chaitanya Bachav2 , Dipyaman Paul3