

"Soldier Health & Position Tracking System Using IOT"

RCET, BHILAI

in partial fulfillment of requirement for the award of degree of Bachelor of Technology

In

Computer Science Engineering

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Abstract

In today's world, warfare is an important factor in any nation's security. One of the important and vital roles is played by the army soldiers. There are many concerns regarding the safety of soldiers. So for their security purpose, many instruments are mounted on them to view their health status as well as their real time location. Bio-sensor systems comprise various types of small physiological sensors, transmission modules and processing capabilities, and can thus facilitate low-cost wearable easy solution for health monitoring. This will give an ability to track the location and monitor health of the soldiers in real time who become lost and get injured in the battlefield. It helps to minimize the time, search and rescue operation efforts of army control unit. This system enables to army control unit to track the location and monitor health of soldiers using GPS module and wireless body area sensor networks (WBASNs), such as temperature sensor, heart beat sensor, etc. The use of GSM and GPS technologies allows the system to track the position and provide up-to-date health information.

Introduction

In the world, the Indian army stands second largest force. The role played by the soldier is very important for the nation security. However, the army is suffering from lot of health issues in the remote place due to unavailability of medical treatment at a proper time which may result in the death/loss of the soldier. The lack of communication with the control room regarding the health status and location of the soldier would lead to loss of the soldier too. This can be reduced if the real time information is available to the nearby control room . The cost of the soldier life is very important. During the battle the soldier may accidentally land up in the enemy location without his knowledge, so he may need guidelines to know his current location. Other than the battle field injuries, the soldier may also suffer from extreme climate condition and fall sick, in such situation if care is taken then the life of the soldier would be saved. This can be achieved by using the IOT. The health parameter such as heart rate, oxygen level and body temperatures are monitored continuously and communicated with the control room automatically

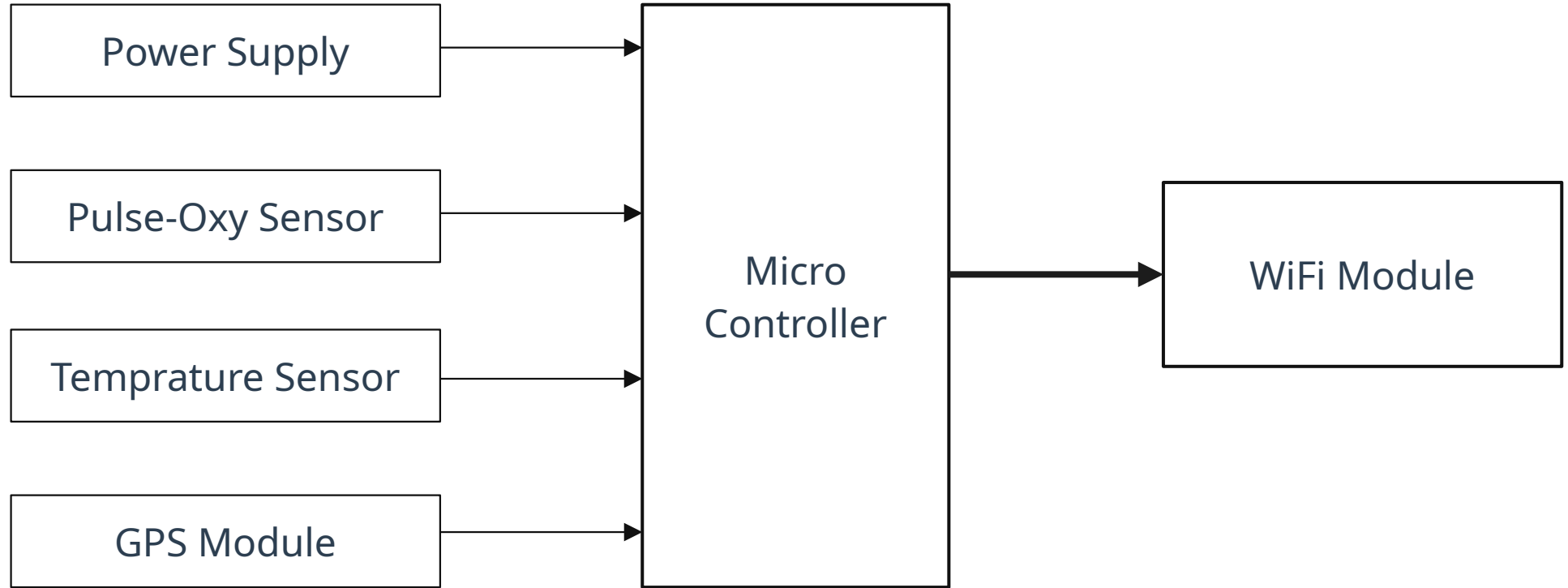
Hardware Used

- **Power Supply 3V**
- **Microcontroller**
- **Wifi module**
- **Pulse Oxymeter Max30100**
- **Temperatre Sensor**
- **GPS Module**
- **Jumper Wires**

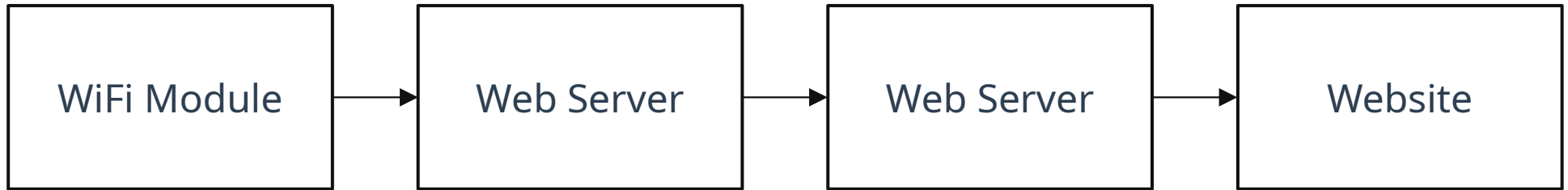
Software Used

- **Arduino IDE**
- **VS Code**
- **PhpMyAdmin**
- **000webhost**

Soldier Unit



Control Unit



Micro-controller Code

```
#include <ESP8266WiFi.h>
#include <Wire.h>
#include "MAX30100_PulseOximeter.h"
#include<ESP8266HTTPClient.h>
#include <WiFiClient.h>
#define REPORTING_PERIOD_MS 500
float BPM, SpO2;
/*Put your SSID & Password*/
const char* ssid = "jerry1"; // Enter SSID here
const char* password = "jerry123"; //Enter Password here
WiFiClient wificlient;
PulseOximeter pox;
uint32_t tsLastReport = 0;
void onBeatDetected()
{
  Serial.println("Beat Detected!");
}
```

Micro-controller Code

```
void setup() {  
  Serial.begin(115200);  
  pinMode(16, OUTPUT);  
  delay(100);  
  Serial.println("Connecting to ");  
  Serial.println(ssid);  
  //connect to your local wi-fi network  
  WiFi.begin(ssid, password);  
  //check wi-fi is connected to wi-fi network  
  while (WiFi.status() != WL_CONNECTED) {  
    delay(1000);  
    Serial.print(".");  
  }  
  Serial.println("");  
  Serial.println("WiFi connected..!");  
  Serial.print("Got IP: "); Serial.println(WiFi.localIP());  
  Serial.print("Initializing pulse oximeter..");  
  if (!pox.begin()) {  
    Serial.println("FAILED");  
    for (;;) ;  
  } else {  
    Serial.println("SUCCESS");  
    pox.setOnBeatDetectedCallback(onBeatDetected);  
  }  
  pox.setIRLedCurrent(MAX30100_LED_CURR_7_6MA);  
  // Register a callback for the beat detection  
}
```

Micro-controller Code

```
void loop() {
  pox.update();
  BPM = pox.getHeartRate();
  SpO2 = pox.getSpO2();
  HTTPClient http;
  if (millis() - tsLastReport > REPORTING_PERIOD_MS)
  {
    String serverName = "http://jerrygps.000webhostapp.com//bpm.php?
    bpm="+String(BPM)+"&oxy="+String(SpO2)+"&temp=56700";
    http.begin(wificlient,serverName);
    http.addHeader("Content-Type","application/x-www-form-urlencoded");
    // String httpRequestData = "";
    int httpcode = http.GET();
    if(httpcode > 0){
      String payload = http.getString();
      Serial.println(httpcode);
      Serial.println(payload);
    }
    else{
      Serial.println("Error");
    }
    http.end();
    Serial.print("BPM: ");
    Serial.println(BPM);
    Serial.print("SpO2: ");
    Serial.println(SpO2);
    Serial.println("%");
    Serial.println("*****");
    Serial.println();
    tsLastReport = millis();
  }
}
```

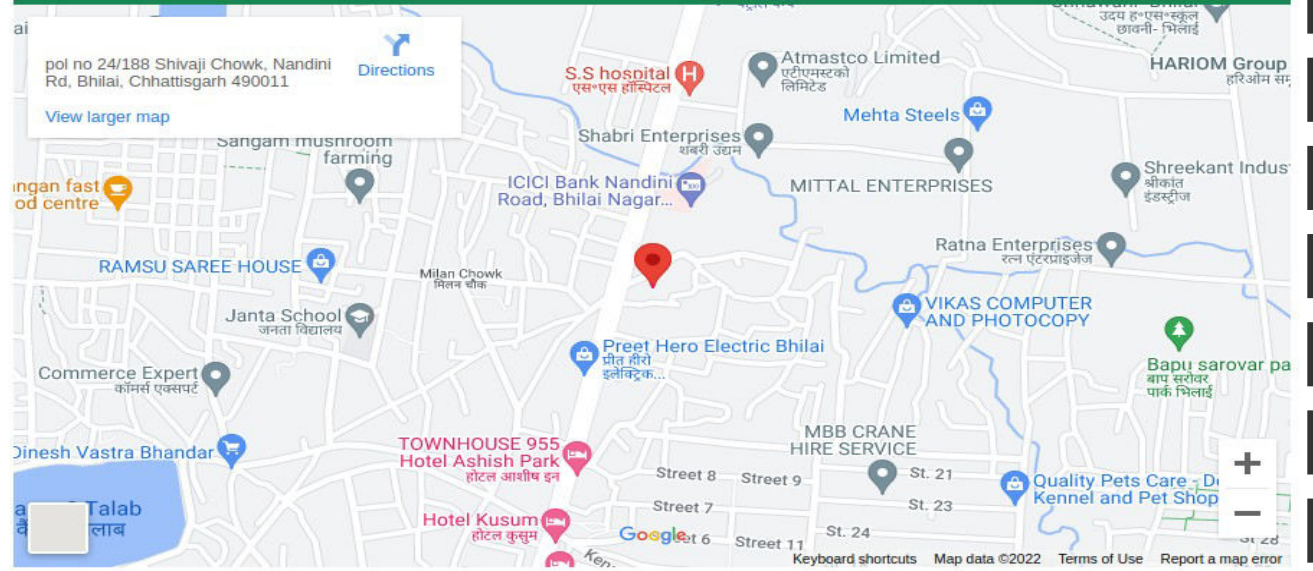
Some Screenshots

Soldier Health And Tracking System.

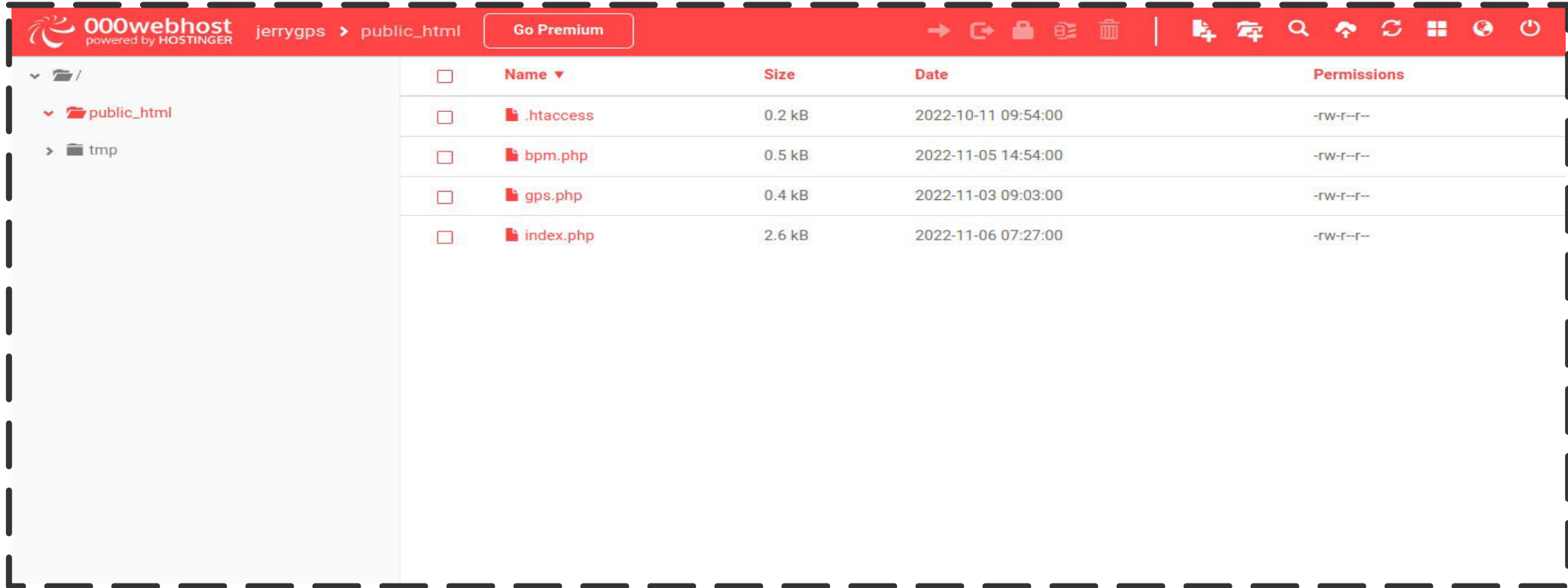
BPM & O₂

- Name : Rohan Sharma
- BPM : 0.00
- O₂ : 0.00%
- Temp : 56700°C
- Status : Please Wear Your Device

Location of Soldier



Some Screenshots



The screenshot displays the 000webhost file manager interface. The top navigation bar is red and contains the 000webhost logo (powered by HOSTINGER), the user path 'jerrygps > public_html', a 'Go Premium' button, and a series of icons for file operations like upload, download, search, and delete. On the left, a sidebar shows the directory structure with 'public_html' selected. The main area features a table of files in the 'public_html' directory.

<input type="checkbox"/>	Name ▼	Size	Date	Permissions
<input type="checkbox"/>	.htaccess	0.2 kB	2022-10-11 09:54:00	-rw-r--r--
<input type="checkbox"/>	bpm.php	0.5 kB	2022-11-05 14:54:00	-rw-r--r--
<input type="checkbox"/>	gps.php	0.4 kB	2022-11-03 09:03:00	-rw-r--r--
<input type="checkbox"/>	index.php	2.6 kB	2022-11-06 07:27:00	-rw-r--r--

Some Screenshots

The screenshot displays the phpMyAdmin web interface. On the left, the 'Database: id19693227_gps' is selected, showing a tree view with 'bpmdata' and 'gpsdata' tables. The main panel shows the 'Table: bpmdata' structure. A yellow banner at the top indicates 'Showing rows 0 - 0 (1 total, Query took 0.0010 seconds.)'. Below this, the SQL query 'SELECT * FROM `bpmdata`' is shown. The table structure is defined by columns: id, name, bpm, oxy, and temp. A single row of data is displayed: id 1, name Rohan Sharma, bpm 0.00, oxy 0.00, and temp 56700. The interface includes various navigation and action buttons such as 'Browse', 'Structure', 'SQL', 'Search', 'Insert', 'Export', 'Import', 'Operations', and 'Triggers'. The 'Query results operations' section at the bottom provides options like 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

Server: localhost:3306 » Database: id19693227_gps » Table: bpmdata

Browse Structure SQL Search Insert Export Import Operations Triggers

Showing rows 0 - 0 (1 total, Query took 0.0010 seconds.)

SELECT * FROM `bpmdata`

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

	id	name	bpm	oxy	temp
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	1	Rohan Sharma	0.00	0.00	56700

☐ Check all | With selected: ☐ Edit ☐ Copy ☐ Delete ☐ Export

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Query results operations

☐ Print ☐ Copy to clipboard ☐ Export ☐ Display chart ☐ Create view

Advantages

- **Cost Effective**
- **Higher reliability**
- **Fast and Efficient**

Applications

- **In Army**
- **In Navigation**
- **In Fitness Band**

Conclusion

The major problem in the military is lack of proper communication between the soldier and the control. From the proposed system we can conclude that the various biomedical sensors sense the body parameters in real time and transmit the data to the control room, there by tracking the current location of the soldier using GSM and GPS technology.



Thank You