

# A Novel Health Monitoring System for Trance Patients

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**Abstract** - Now a day's need for monitoring of patients has grown in the health care system so here to propose a monitoring system for coma patients. Coma is a state of unresponsiveness in which patient lies with his eyes closed and cannot be respond to the outer environment such cases require a serious attention and continuous monitoring to save the patients lives. The health parameters like temperature, heartbeat, body movement, eye movement and percentage (%) of hemoglobin in the blood that is saturated with oxygen are monitored by different types of sensors such as temperature sensor, heartbeat sensor, body movement sensor, eye motion sensor and spo2 (Saturation of Peripheral Oxygen) sensor. In the existing system the man power to monitor the patients continuously is tedious process, so here to develop a proposed work by if there is find any abnormalities from the coma patients the data will be send through GSM to the respective doctors and their relatives of the patients. Moreover the system uses Wi-Fi for IOT wherein "Thingspeak" is used to monitor the coma patient online via mobile phone. So consequently, there is no need for a lot of clinical staff for accompanying persons to be physically present to check the condition of the patient. This "Thingspeak" is used to regularly monitor the coma patient's condition status with appropriate time and date for result analysis.

**Key Words:** Internet of things, GSM, Health monitoring system, sensors, WI-FI module, coma patients.

## 1. INTRODUCTION

A coma, sometimes also called persistent vegetative state is a profound or deep state of unconsciousness. Persistent vegetative state is not brain death. An individual in a state of coma is alive but unable to move or respond to his or her environment. It has no physical control over his entire body. Such cases require a serious attention and continuous monitoring to save the patient's lives. Nowadays having someone to watch critically ill person is very expensive and takes lots of man power. Besides, such a continuous supervision by a paramedical assistant is error prone so it is important and necessary to propose health monitoring system for a coma patient. In this proposed system. The health parameters are implemented by temperature sensor, heart beat sensor, accelerometer sensor and eye blink sensor and spo2 sensor.

This system continuously monitors and records all vital information of a particular subject by monitoring all the

records of that comatose manually. So the surgeon can continuously more than one patient for more than one parameter at a time in remote place. The advances in information and communication technologies enable technically. The continuous monitoring of health related parameters with wireless sensors, wherever the user happens to be. In case of critically ill patients it requires to measure the vital parameters at least for 15 seconds until the patient's condition stabilizes. They provide valuable real time information enabling the physicians to monitor and analyse a patient's current and previous state of health.

## 2. LITERATURE SURVEY

In [1] "Dedicated real-time monitoring system for health care using ZIGBEE", by Alwan, K. Prahald Rao-2017.

The paper presents an efficient embedded system based wireless health care monitoring system using ZIGBEE. Their system has a capability to transmit the data between two embedded systems through two transceivers over a long range. In this, wireless transmission has been applied through two categories. The first part which contains ARDUINO with ZIGBEE will send the signals to the second device, which contains Raspberry with ZIGBEE. The second device will measure the patient data and send it to the first device through ZIGBEE transceiver. The designed system is demonstrated on volunteers to measure the body temperature which is clinically important to monitor and diagnose for fever in the patients.

In [2] "Thingspeak Based Sensing and Monitoring System for IoT with Matlab Analysis" by Pasha S, (6), pp. 19-23. 2016.

Health monitoring system for fitness related program, monitoring chronic diseases and for elderly persons. The system will monitor health parameters such as hemoglobin count, sugar level, blood cell count, pulse and temperature. These data are extracted from respective sensors and are sent to the local server using either Bluetooth or ZigBee.

### 3. TEMPERATURE SENSOR

The sensor LM35 is an integrated analog temperature sensor and measures the human body temperature rate and the sensor have an analog output voltage proportional to the temperature and it provides an output in centigrade and temperature sensor output is more precise than thermistor output and it has low output impedance, linear output and it is used as a comparator circuit and it operates from 4 to 30 volts.



Fig -1: Temperature Sensor

### 4. HEART BEAT SENSOR

Heartbeat sensor is used to measures the heartbeat rate per minute by using an optical LED light source and LED light source. The light travels through the skin, and heartbeat sensor measures the rate of light to be reflected backwards and IR light is required for the contract and afterwards relaxes and the determination of heartbeat rate by expanding and diminishing of oxygenated blood.



Fig -2: Heart beat Sensor

### 5. EYE BLINK SENSOR

The Eye blink sensor sense the eye blink by using infrared source. The variation across the eye will vary as per the eye blink. There are two specific levels in the eye motion sensor that is opening and closing of the eye movement. If the eye is closed the output is high and the other one the eye is opened the output is low by these ways determine the development of closing and opening of eye.

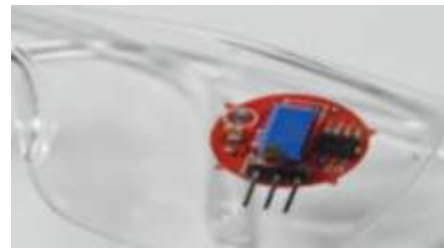


Fig -3: Eye Blink Sensor

### 6. BODY MOVEMENT SENSOR

Accelerometer is utilized as body movement sensor which is used to predict the motion tracking of the patients. It is the strategy for recording developments of individuals and objects. This sensor is a gadget which is delicate to the infrared radiation so then distinguishes the patient development whether to be moved as in right, left or straight position and these sensors are exceptionally created for information observing for the biophysical and the biochemical component.



Fig -4: Body Movement Sensor

### 7. SPO2 SENSOR

SPO2 sensors is peripheral capillary oxygen saturation sensor which measures the level of oxygen saturation of the patient blood and this sensor have an infrared light source and photo detectors to transmit light and spo2 sensors have two methods transmitting and the reflecting method and this sensor is placed in the patient finger tip or earlobe.



Fig -5: SPO2 Sensor

The framework consequently records normal glucose esteem at regular intervals for as long as 72 hours.

## 8. ARDUINO IDE

ARDUINO IDE is official and essential programming software. It is fundamental for Arduino-Uno devices. The open source Arduino Software (IDE) makes it very simple to compose program code and transfer it to the board. It runs on Windows, Mac OS X, and Linux. The Arduino Integrated Development Environment is a cross-stage application that is written in JAVA and development on preparing.

### 8.1 INSTALLATION OF ARDUINO IDE

Step 1: Download the Required Software and Files

Step 2: Get the SD Card and the Card Reader

Step 3: Check the Drive in Which the SD Card Is Mounted

Step 4: Format the SD Card

Step 5: Write the OS on the SD Card

## 9. EXISTING SYSTEM

The Existing framework gives the solution for just three wellbeing parameters of the trance like state patients. This existing work utilizes the results of heart beat sensor, Temperature sensor and body development sensor for detecting the health parameters such as heartbeat rate, internal heat level, patients body temperature and movements of the trance like state patients. In the event there is discover any variations from the health parameters of the patient the microcontroller sends an alarm message through the GSM module. It sends that information to the mobile phone of the patient's in charge person and guardian.

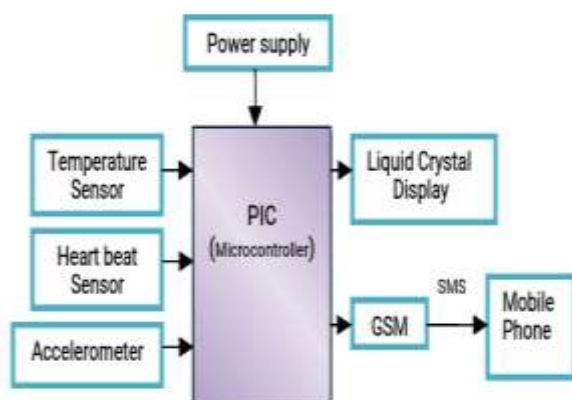


Fig -6: Existing system

There is any irregular condition the message alert send through GSM module to the cell phone as SMS and also it showed in LCD board. These drawbacks could be overwhelmed by the proposed framework.

## 10. PROPOSED SYSTEM

The proposed system was implemented by using an IoT technique known as Thingspeak. This system uses additionally two sensors which are Eye blink sensor and, SPO2 sensor to monitor the eye blink and oxygen saturation percentage of the coma patients. All sensors of the proposed frame work and these sensors output values are used to checked health condition of the coma patients. These sensors are connected to the microcontroller to monitor the health parameters of the coma patients.

If there is find any abnormalities in any of the health parameters of the patient the microcontroller immediately sends an alert message through the GSM module and Wi-Fi module. The proposed frame work used Nemours health sensors such as temperature sensor, heart beat sensor, body movement sensor, eye blink sensor and SPO2 sensor. These sensors have been used for IoT so as to be transmitted using the ESP8266 Wi-Fi module and the patient's data can be saved, analyzed, displayed in forms of graphs and it can be viewed by using mobile application.

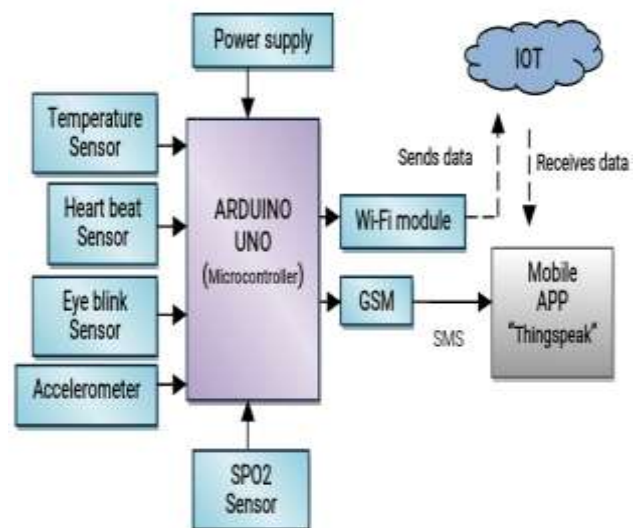
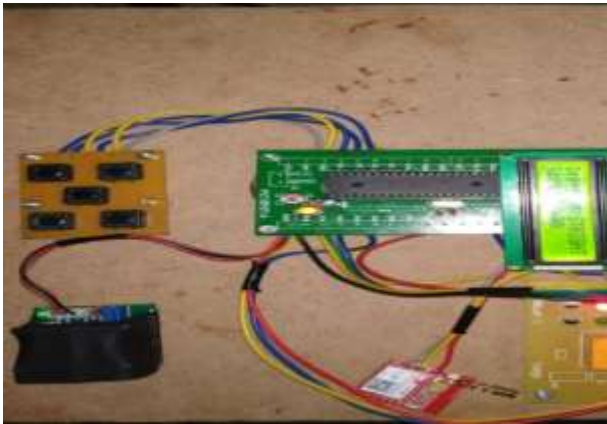


Fig -7: Proposed system

The entire proposed work is autonomous hence there are requirement of clinical staff is decreased and if we used the monitoring system at home, the need of physical presence for monitoring will be reduced too. The cost of clinical staff is also reduced exponentially.

## 11. RESULT & CONCLUSION



**Fig -8:** Result

This system introduces an IoT based health care monitoring system for the coma patients along with GSM. The proposed system analyzes the health parameters values. In case those values are abnormal, GSM module will be triggered to send SMS message to predefined Smartphone number. The overall accuracy of the system is above 90% in different situations. However, we're looking for to enhance the overall accuracy of the project in the future.

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