



## IOT Based Health Monitoring System for Comatose Patients

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# IOT Based Health Monitoring System for Comatose Patients

*Abstract: Coma is a state of unconsciousness where the patient fails to respond. These patients need utmost care and 24\*7 observations. This paper presents a continuous monitoring and recording of patient data without human intervention. If there is any sudden changes occur in the normal range of body parameters such as body temp falls or rise, blood pressure (B. P.) increases or decreases causing high or low B.P. where both are not stable conditions for better health, then it has facility to automatically alert the medical person. The movement sensor detects the patient movement and also generates an alert message to the medical person. As comatose losses their sensation for urination, medical person needs to continuously monitor urine output, thus we are using ultrasonic sensor to check on urine level. Medical person can keep the track of patient using login to the system.*

## **1. Introduction**

As we know coma is a state of unconsciousness in which patient cannot feel or respond to the pain, light or sound, it does not initiate volunteering any actions.

Patients in a coma state need to have a continuous update of Blood pressure, temperature, humidity, and urine level. This system will collect the information of patients with the help of sensors. These sensors use WIFI to communicate this information to the internet.

This system is powered by the Raspberry Pi it includes a blood pressure monitoring unit and an

ultrasonic sensor to check urine, temperature sensor, motion sensor, and an LCD display.

This system tests urine level and also updates the value over IOT and LCD, when the patient urinates.

In case if the patient regains consciousness and attempts to move, the sensor will detect the motion and update it over IOT and LCD. In this way, our system monitors the comatose patients.

## **2. LITERATURE SURVEY**

[a] Body Movement and Heart Beat Monitoring For Coma Patient Using IoT by Dr.R. Josphine Leela M.E , Ph.D. ,K. Hamsageetha , P. Monisha ,S. Yuvarani. International Journal of Innovative Research in Science, Engineering and Technology, March 2018. They have used Flux sensor for finger movement which is excellent. Eye movement sensor implementation.

[b] Health monitoring for coma patients by Geethanjali R., Majidha, Fathima K. M., Harini S., Sabitha M.

International Journal of Emerging Research & Development, Year 2019.

Integration between software and hardware for data processing made effective using Microsoft Azure IOT services. Eye movement can be add to make system more effective.

[c] Iot based Healthcare System for Coma Patient by Ankita Ramtirthkar, Jyothi Digge, V.R.Koli. International

Journal of Engineering and Advanced Technology (IJEAT), February 2020. Combination of different sensors and connection with proper softwares and hardwares made process fast and more accurate.

### **3. RESEARCH GAP**

The gap in paper [a] is Lack effectiveness in other sensors and sensors could have been better. The gap in paper [b] is Eye movement can be add to make system more effective. There is no research gap in paper [c].

### **4. PROBLEM DEFINITION**

The main goal of our project is to create a device which will ease the required efforts of a medical personnel to monitor a comatose patient.

The device will be a boon to medical authorities and will help the family members not only to have an access to convenient and efficient updates about the improvement but also will notify any emergencies about the concerned.

The device will keep track of accurate measurements, movements and progress of the concerned.

### **5. PROPOSED METHODOLOGY**

The proposed health monitoring system consists of different sensors which are divided into two categories. One is used for monitoring vitals of the comatose and second is used for detecting any physical changes occur in the comatose. Here, temperature and blood pressure are the two vitals recorded and monitored to understand health status of a comatose. Temperature and blood pressure are the two vitals recorded

and monitored to understand health status of a comatose. The other two sensors are accelerometer sensor and Eye blink sensor which are used for detecting any physical changes that occur in a comatose. These signals which provides information are recorded and monitored continuously to understand the body functioning. All sensors are interconnected with the Raspberry-Pi device and this device is connected to the IoT server, which provides services and controls over the network.

The hardware system include: -  
Blood pressure sensor: To know about the blood pressure rate of patient. Temperature sensor: To measure the body temperature. Eye blink sensor: To sense the movement of eye. Ultrasonic sensor: To know about urine level. Accelerometer sensor: To detect change in body position. Oximeter: To measure oxygen level of the patient.

This designed system is consists of two modules, hardware and software. The hardware module comprises transmitters and receivers, which are nothing but different sensors and raspberry - pi module and the software module contains, Python, Thing Speak, Twilio, and their interface. Developed monitoring system is evaluated for the performance.

A health observing system comprises of variety of sensors connected to the patient and they

communicate that data via the processing unit to the server. In this project, Raspberry-Pi is acts as a data junction node as well as a processor. The patient and doctor smartphone or computers are used as a monitoring device.

The sensors are used to measure the health parameters of patient after these parameters are acts as readings and finally converted into signals. These signals are provided for processing to Raspberry-Pi. Then Raspberry-Pi displays the information on a monitor and also stores the information over the cloud with the help of IoT. This information can be accessed by the doctor on his phone /computer and get the notification. Also there is facility provided to send an alert message to the doctor or patient caregiver if any abnormal data is detected.

The workflow of the project is as-the sensors value are read and displayed on the monitor and stored in the cloud for future use.

## 6. NOVELTY IN OUR IDEA.

Alternative Use Of Raspberry Pi is Beagle Bone Board. As Beagle Board Bone Is Advanced Version RPI. It Consists Of Internal Memory And Speed is about 1GHz On Board Processor. It Does Not Hang the System. Also It Is Very Easy To Handle The System in less time.

## 7.EXPECTED OUTPUT.

If there is any changes occur in body position, eye movement and urine level of comatose then an alert SMS is send to the doctor or any medical person

The expected alert messages are shown below in fig. (1)

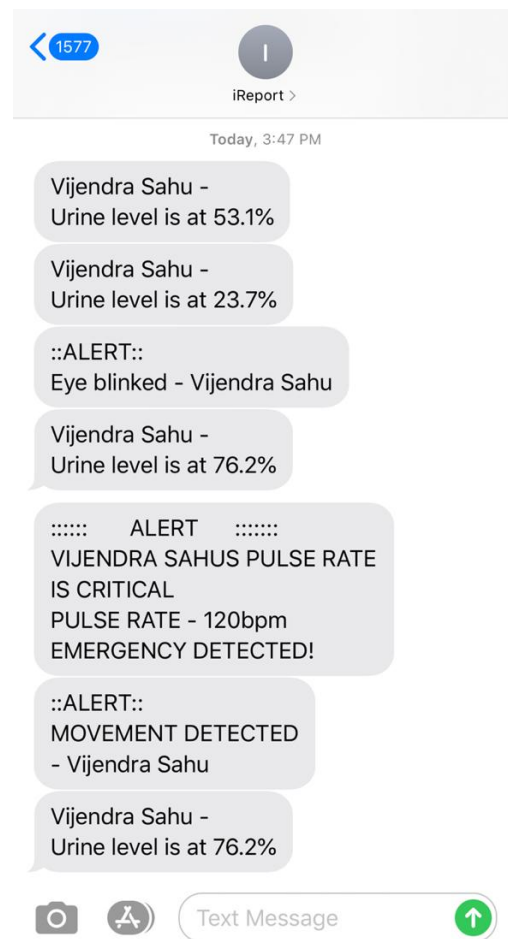


figure. (1)

## 8. CONCLUSION

The aim of our proposed system is to build easily accessible design that the patient's critical information is conveyed quickly to the doctor is achieved. The designed model leads to the better and effective health care service to

comatose and the collected data is networked worldwide with the help of internet and communication which provide a quick response. The IoMT market involves variety of smart devices, such as wearable and medical/vital monitors, in the home, or hospital; and associated real-time location, telehealth and other services. With the help of above devices doctor can easily examine his patient at anytime, anyplace. In this proposed system vital parameters such as B. P., temperature are monitored.

Movement sensor and eye blink sensor is used to detect motion of body parts of comatose. Ultrasonic sensor is used for urine level monitoring. Also the designed system is affordable to the patients.

## 9. REFERENCES

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