

IoT Based Monitoring System for Comatose Patients: A Review

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Abstract

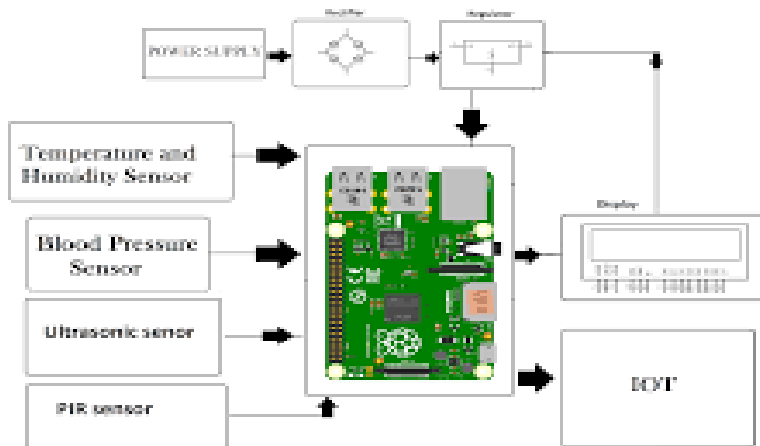
Coma is a state of unconsciousness where the patient fails to respond. These patients need utmost care and 24*7 observations. This paper presents a continuous monitoring and recording of patient data without human intervention. If there is any sudden changes occur in the normal range of body parameters 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.

I. 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. Doing this manually can become almost impossible to keep updates of multiple patients at the same time. In order to address this situation, our system comes to the rescue; 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. When we turn the system on, it gets connected to the website using WIFI, System monitor shows four signs namely heart rate, temperature, humidity, and urine output. While testing heart rate function of the system, the heart rate and blood pressure value get updated over IOT and LCD display. As we know the patient who is in comatose cannot urinate on their own so a rubber tube is inserted into their bladder to remove urine. 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

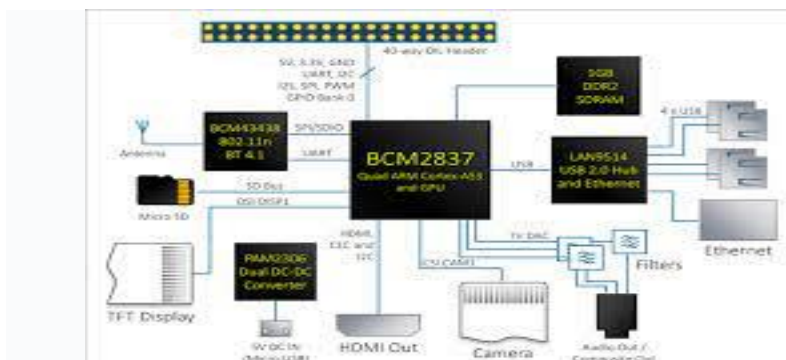
IOT and LCD. In this way, our system monitors the comatose patients.

II. BLOCK DIAGRAM



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III. Raspberry Pi 3



- Raspberry pi 3 model b adds wireless LAN and Bluetooth connectivity making it the ideal solution for powerful connected designs.
- Raspberry pi 3 use Processor chipset Boardcom BCM 2837 64 bIT ARMv7 Quad Core processor powered Singel Board Computer running at 1200MHz
- Raspberry pi 3 model b RAM : 1GB SDRAM@400MHz

IV. PIR SENSOR



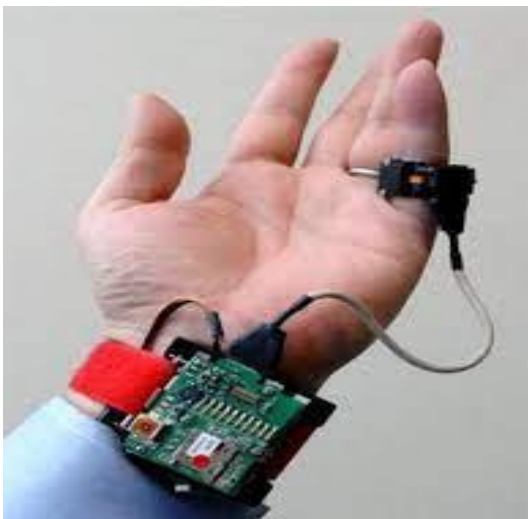
Passive InfraRed Sensor A device used to detect motion by receiving infrared radiation. When a person walks past the sensor, it detects a rapid change of infrared energy and sends a signal. PIR sensors are used for applications such as automatically turning on lights when someone enters a room or causing a video camera to begin operating.

V. F3 EVO CONTROLLER



The F3 Evo brushed flight controller is based of the popular SP F3 Evo flight controller design but includes some extra electronics to allow you to use this board with coreless brushed motors for a nano quadcopter build. This flight controller is fully compatible with Clean Flight and Betalight.

VI. BLOOD PRESSURE SENSOR



Blood Pressure (BP) is one of the important vital signs. It is the pressure exerted by the circulating blood on the walls of blood vessels. Blood Pressure is expressed as the ratio of the systolic pressure over

diastolic pressure. Mercury sphygmomanometer is being used for measuring blood pressure. In this, the height of the column of mercury is considered for measuring the blood pressure. The oscillometric method is used for automated blood pressure measurements since 1981. With the advance in technology devices for measuring blood pressure through the non-invasive oscillometric method are being developed. One such device is the Blood Pressure Sensor.

VII. FUTURE SCOPE

1. For further implementation, in emergency situations, this system can automatically send a warning message or call to alert the nearest hospital as well as to the ambulance if any abnormal data is identified in monitoring.
2. The advanced development for the designed model is to add more parameters for monitoring the health status of patient.
3. In future improvement to this designed model is to include MEDIBOX. This system can be used by the paralyzed patients by sending or giving reminder alert to take their medicines or dosage on time.
4. Another extension to this system is to add web camera, after that anyone can monitor patient worldwide at any time.

VIII. 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. So, with the help of these devices doctor can easily examine his patient at anytime, anyplace. In this proposed system vital parameters such as B. P., temperature is 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.

IX. REFERENCES

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