

REMOTE PATIENT MONITORING USING INTERNET OF THINGS

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Abstract— Most of the time people at rural areas lose their lives due to lack of access to higher end medical treatments and diagnosis. This happens largely because the health care unit at rural areas do not have facilities for higher end treatment. Moreover they are unable to share the patient details to doctors present at other locations for any consultation regarding guidelines to undergo further treatment. This problem can be eradicated by improving the efficiency of healthcare by transferring information from patient at rural health care unit to the doctor at other location through IoT for obtaining guidelines to undergo further treatment based on the patient data. The Internet of Things (IoT) is a device which gathers and share information directly with transmitter and receiver, this enables the doctor to gather record and examine new data streams quicker and more accurately. The IoT technology fetches the data from the sensors attached to patient like heart rate, temperature and patient position.

Keywords—: IoT ,Patient data, PIC Microcontroller

I. INTRODUCTION

The intention of this project is to examine and improve the quality of care of people in remote locality. Also using this technology if the doctor at remote healthcare unit wants consult with doctor present at any other part of the world, then the doctor can share the patient's data for getting guidelines regarding the further treatment to be provided.

IoT

Internet of Things (IoT), brings together and shares information directly from patients. It also makes it possible to collect, record and analyze new Data Stream. This provides data communication capabilities. Internet of Things (IoT) is increasingly accepted by the researchers as one of the most sophisticated technologies for health monitoring and it is safety for people and it also tackled by all.

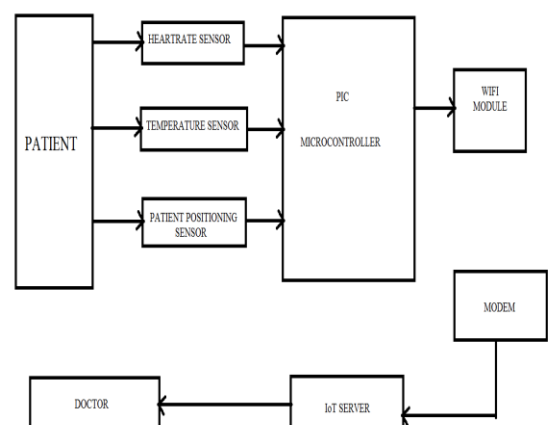
II. EXISTING METHOD

At present, patient monitoring is being done using zigbee module. Though zigbee based telemedicine provides bidirectional communication, the main drawback of using zigbee module for remote patient monitoring is its short range of communication. So, we have implemented monitoring of patient at remote location using Internet of Things.

III. PROPOSED METHOD

In this paper, we have used Internet of Things concept to implement remote patient monitoring. The signals such as Heartrate, Temperature and Position of the patient are fetched from the patient using Heartrate sensor, Temperature sensor and Patient Positioning sensor. It is then given to microcontroller which has an inbuilt Analog to Digital converter to convert the analog signals to a corresponding digital form for transmission over the Wireless Fidelity module to be stored in the cloud. At the receiver side, these data can be fetched by a doctor.

A. BLOCK DIAGRAM



A. SENSORS

HEART RATE SENSOR

Heart rate is an essential parameter that is directly related to the accuracy of the human cardiovascular system. The project describes a method of measuring the heart rate through the tip of the finger using a heart rate sensor. The variation of blood inside the finger due to pumping action is detected using an optical sensing mechanism placed around the tip of the finger. The signal is sent to the microcontroller to count the rate of fluctuation, which is actually the heart rate.

TEMPERATURE SENSOR

The temperature sensor is a device that is used to measure temperature with an electrical output proportional to the temperature. Here we have used LM35. The LM35 series are precision IC temperature devices with an output voltage linearly-proportional to the Centigrade temperature. Here we have used this sensor to obtain the temperature of the patient.

PATIENT POSITION SENSOR

The Patient Position Sensor monitors five different patient positions such as standing/sitting, supine, prone, left and right. In many cases, it is necessary to monitor the body positions and movements being made because of their relationships to particular diseases. Analyzing movements during sleep also helps in determining sleep quality and irregular sleeping patterns. The body positioning sensor could also detect fainting or falling of aged people or persons with disabilities. Moreover we can confirm if the patient is present when the signals are fetched.

B. PIC MICROCONTROLLER

PIC is the abbreviation of Programmable Interface Microcontroller. It has an inbuilt analog to digital converter which converts the analog signals such as heartrate, temperature into digital signal for further processing.

IV.RESULTS

TEMPERATURE	HEARTRATE	PATIENT PRESENT?
37	73	Y
37	75	Y
36	72	Y

V. CONCLUSION

Thus by using this method, the doctor can share the details of the patients at remote locations to other doctors present at some other location. They can also get guidance on what further treatment must be carried. The patient monitoring using Internet of Things (IoT) is a state of art technology. It is also useful for the society. Moreover, it is cost-effective and easy to execute.

VI.FUTURE WORKS

In this paper we have used PIC crocontroller. But in future we would like to replace it with Arduino board. Also, in this paper we have measured only temperature and heart rate of the patient. In future we would like to incorporate other signals like ECG, EEG, EMG, Blood pressure etc.,

VII.REFERENCES

- [1] Robert SH Istepanian, Emil Jovanov, YT Zhang, "Guest editorial introduction to the Special Section on M-Health: Beyond Seamless Mobility & Global Wireless Health- Care Connectivity" International Journal of Information Technology in Biomedicine, Vol.8,PP.405-414,2004.
- [2] Chirs Otto, Aleksandar Milenkovic, Corey Sanders, Emil Jovanov, "System architecture of a wireless body area sensor network for ubiquitous health monitoring" International Journal of Mobile Multimedia ,Vol.01, PP.307-326,2006.
- [3] Darkins, A., Ryan, P., Kobb, R., Foster, L, Edmonson, E., Wakefield, B., & Lancaster, "The systematic implementation of health informatics, home Telehealth, and disease management to support the care of Veteran patients with chronic conditions" International Journal of Tele-medicine J E-health, Vol.14, No.10, PP.1118-1126,2009.
- [4] Chaudhry, S.I., Mattera, J.A., Curtis, J.P., Spertus, J.A., Herrin, J., Lin, Z., Phillips, C.O., Hodshon, B.V., Coopers, L.S., and Krumholz, H.M. "Telemonitoring in patients with heart failure", International Journal of Mass Medicals, vol.363, PP. 2301-2309,2010.
- [5] Chase, H.P., Pearson, J.A., Wightman, C., Roberts, M.D., Oderberg, A.D., &Garg, "Modem transmission of glucose values reduces the costs and need for clinic visits", International Journal of Diabetes Care, vol.26, No.5, PP.1475-1470,2010.
- [6] Hoi Yan Tung, Kim Fung Tsang, Member, IEEE, Hoi Ching Tung, Kwok Tai Chui and Hao Ran Chi " The Design of Dual Radio Zigbee Homecare Gateway for Remote Patient Monitoring" IEEE International Conference on Consumer Electronics, Vol. 59, PP.756-764 No. 4,2013.
- [7] Rghioui, A.; Dept. of Computer. Sci., AbdelmalekEssaadi Univ., Tangiers, Morocco;L'arje, A. ;Elouaai, F. ;Bouhorma, "The Internet of Things for healthcare monitoring: Security review and proposed solution "Third IEEE International Colloquium on Information Science & Technology ,Vol.78,PP.384 – 389,2014.
- [8] Fiona.E.Josy(PG Scholar)&Mr R. Allen Joseph (Asst.Professor)Dr.Pauls Engineering College, "Human Health Monitoring System using Android Mobile Phone and GPRS" International Journal of Emerging Technology in Computer science & Electronics, Vol.84,PP.542-549,2014.



Fig 1. Heart rate sensor



Fig 2. temperature sensor



Fig 3. patient position sensor

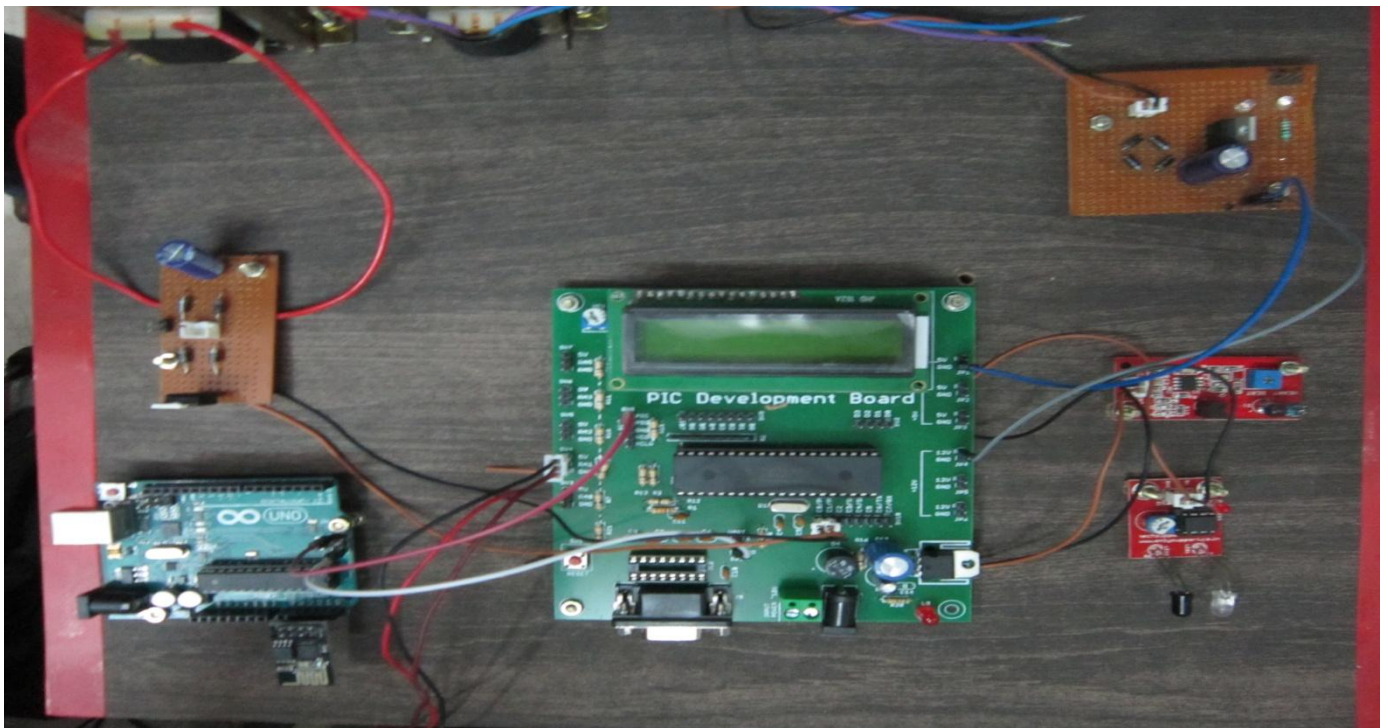


Fig 4. Remote patient monitoring kit