Patient Health Monitoring Using GSM Module

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A B S T R A C T

The main aim of this project is to make a low cost affordable health monitoring system for the people in remote locality and the availability of doctors take time to reach. The system is easy to use by anyone, low cost and portable. This concept is developed using GSM so we can send data from remote location to the doctors and accessed by them. This project is designed using Arduino UNO, Pulse Oximeter Sensor-MAX30100, DHT11 sensor (Digital Humidity Temperature Sensor), GSM (Global System for Mobile Communication) module 900A, 16X2 LCD display. Using the Pulse Oximeter we can get the pulse rate. All the above readings (temperature, pulse rate) can be displayed on the LCD. It has the capacity of reading and transmitting emergency signs to the cloud and then to Doctor's Smartphone. These readings can be utilized to recognize the health state of the patient and give necessary precautions and medicines to the patient.

1. INTRODUCTION

Previously monitoring of patient by doctors in remote location is impossible or taking extra time to reach during critical conditions. So we introduced a method in which it take data from patient and send data to your mobile phone and you can transfer the data to the doctor and we can intimate caretaker when patient is in critical condition. Patient monitoring is not another new framework in medicinal services as it was first begun in the year 1625 for checking the body temperature and pulse of patients. Subsequently, this framework has started to discover its utilization and acknowledgement for checking diverse sorts of physiological parameters and health related angles that are being performed as of not long ago. These days, the health care sensors are playing a fundamental part in hospitals. The patient checking monitoring is one of the significant improvements as a result of its creative innovation. A programmed remote health observing system is utilized to quantify patient's body temperature, pulse by utilizing implanted innovation. The proposed system utilizes sensors like pulse sensor, oximeter and temperature sensor. These sensors mostly include in observing the health condition, fall detection and sleep pattern of the patient.

2. RELATED WORKS

[1] A large portion of the developing nations have extremely poor healthcare foundation there are not very many clinics in contrast with blasting population. Few of doctor's facilities are deficiently prepared where very less number of specialists is available. The basic diagnostic equipment for the diagnosis of life threatening diseases is absent.
[2]In the event that this paper could fabricate an ease compact health detecting gadget, involving a few sensors, equipped for measuring the vital attributes of a human body, and can speak with the doctor's facility database, it could furnish with quality therapeutic guidance.

The restorative administration is given after one of the authority specialists from a group of particular specialists display everywhere throughout the globe assesses those health parameters on the clinic's database.

[3] In today's social protection system for patients who remains in home amid post operational days checking is done either by means of administrator/medicinal guardian. Endless watching may not be expected by this system, in light of the fact that anything can change in prosperity parameter within some fraction of seconds and in the midst of that time if the specialist is not in the premises causes more important damage.

[4] So with this advancement made period where the web directs the world gives an idea to add to doctors from a group of specialized doctors present all over the globe where time to time consistent checking of the patient is refined.

[5] In the current scenario in hospital either nurse or doctor move physically from one to another person for health check so monitoring everyone continuously is not possible.

[6] This may be a strain for doctors who have to take care of lot of patients in the hospital. These days Pulse oximeter, Thermometer are available in small size and can be accessed by anyone but they are not efficient and expensive. We have to spend extra money to buy two separate devices. In some remote locations every people is not able to share the data shown on the devices.
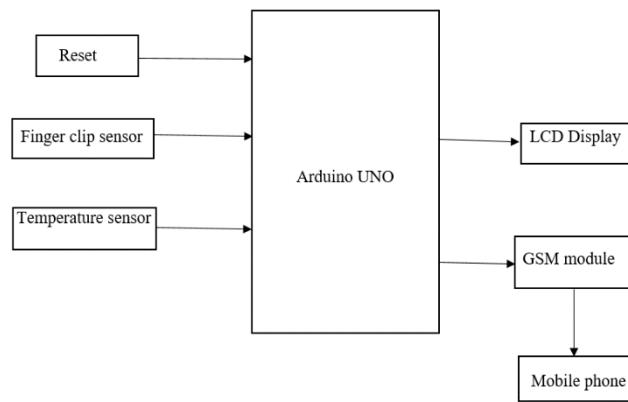
3. METHODOLOGY AND IMPLEMENTATION

Fig. 1 System Block Diagram

Our system take patient's Pulse rate, Body temperature, Blood oxygen level when needed in any remote location. The recorded data will send to user mobile phone and they transfer to their respective doctor. This system reduces the physical monitoring of medical staff and also reduces the movement of patient that is quite difficult.Our system takes data from Pulse oximeter sensor MAX 30100, DHT11 and send data to Arduino UNO which displays result on 16X2 LCD display and uses SIM900A complete dual band GSM/GPRS solution in a SMT module to send data to user mobile phone. It can be embedded in customer application with a low power consumption.

4. MODEL ARCHITECTURE

Components used
1. Arduino UNO
2. Pulse oximeter sensor MAX 30100
3. DHT 11 temperature sensor
4. GSM 900A module
5. LCD 16X2
6. Connecting wires

The Arduino UNO is an open source microcontroller board based on the microchip ATmega328P microcontroller and developed by Arduino.cc. It has 5V of operating voltage and 7 to 20V input voltage. There are14 digital I/O pins of which 6 can provide PWM output.
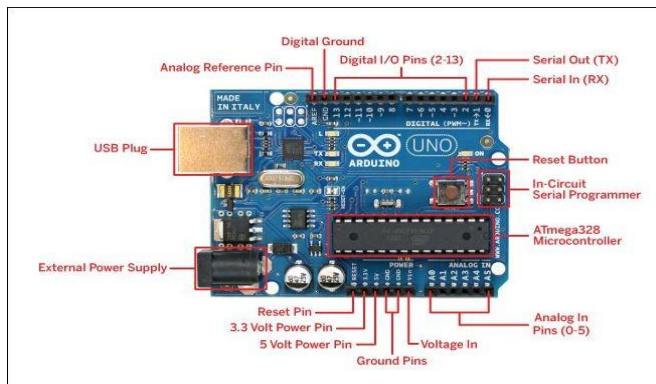
Fig. 2 Arduino UNO

The principle of pulse oximetry is based on differential absorption which record oxygen level of blood and pulse rate and send the recorded data to Arduino UNO.

Fig. 3 DHT 11 & Pulse oximeter

For temperature measurement DHT 11 has thermistor which measures the temperature and send it to Arduino UNO. All the measured data can be shown on LCD display and within a minute the recorded data can also be shared on user mobile phone.
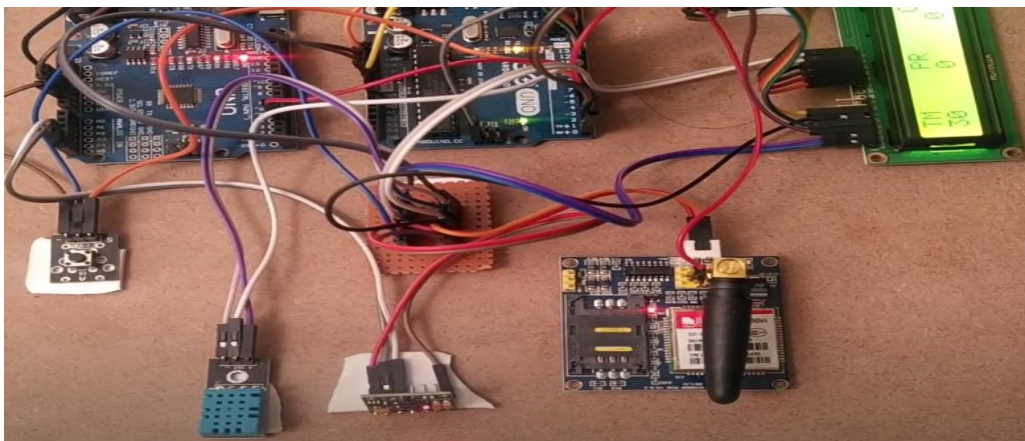

Fig. 4 Hardware model

5. EVALUATION AND FINAL RESULT

We have successfully implemented our system, below the result obtained from the model. As the obtained result can be transferred to the doctors through user mobile phone. So the doctor uses these details and give necessary medicines and precautions. This system is very helpful for old age people as their movement is difficult so this system is very helpful.
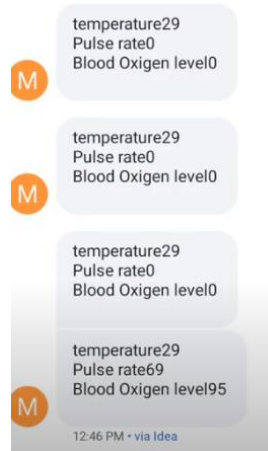
Fig. 5 Result on user mobile phone

6. CONCLUSION

Using of this device is very simple the user have to only switch on the device and by placing finger into finger clip sensor the monitoring of patient can be done. Once this done it takes 1 minute of minimum time and the exact parameter can be shown on LCD and also send data to your mobile phone. The parameter observes like Pulse rate, Body temperature, Blood oxygen level. The user can transfer observed data to their respective doctor so they easily access them. It plays a vital role in saving the life of patient.

7. FUTURE SCOPE

1. Speciallyold age patient should be periodically monitored.
2. Wi-Fi module is also possible but it increases complexity like availability of internet, making account etc.
3. In this project we can observe Pulse rate, Body temperature, Blood oxygen level.

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