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IOT Based Covid-19 Patient Health Monitoring System in Quarantine

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***Abstract* - In times of COVID we have special Covid 19 Quarantine centers setup in order to treat covid patients. Since covid is highly infectious it is very important to quarantine covid patients but at the same time doctors need to monitor health of covid patients too. With the increasing number of cases it is becoming difficult to keep a track on the health conditions of so many quarantined patients. The problems here are Doctors need to regularly monitor patient health and there are increasing number of patients for the doctors to monitor and also doctors are at risk of infection just for monitoring purpose. To Solve this issue we here design a IOT based health monitor system that allows for remotely monitoring of multiple covid patients over the internet. The system monitors patient heartbeat, temperature and blood pressure using a heartbeat sensor, temperature sensor and BP Sensor respectively. The system then transmits this data over the internet using wifi transmission by connecting to wifi internet connection. The data is transmitted and received over IOT by IOT Gecko platform to display data of patient remotely. The entire system is run by a microcontroller based circuitry. If any anomaly is detected in patient health pr if the patient presses the emergency help button on IOT device, an alert is sent over IOT remotely. This System allows Doctors to monitor patients remotely without risk of infection and Doctor gets instant alert in case of health fluctuations of emergency.**

In this paper, we have proposed ECG Monitoring System based on IoT (Internet of Things) Using this system doctors at hospital can analyse the critical parameters sent by this system. Doctors can also analyse the real time health related parameters of a patients which are not admitted in hospital. We have integrated ECG sensor in this system.

Keywords: IOT Gecko, Arduino, WiFi Module, Wireless ECG, AD8232.

I. INTRODUCTION

Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes.

The Internet of Things is considered now as one of the feasible solutions for any remote value tracking especially in the field of health monitoring. Our proposal is to make an IOT based corona virus patient monitoring device. Vital signs like body temperature and pulse rate of patient are very important to monitor regularly to check patient's health condition. This device will record pulse rate and body temperature of more than one patient at a time. The system transmits this data over the internet using WiFi transmission by connecting to WiFi internet connection. The entire system is run by microcontroller based circuitary. An emergency button will also be provided so that patient can press it on emergency an alert is sent over IoT remotely.

Additionally, this board includes pins like the right arm (RA), left arm (LA) & right leg (RL) pins to connect custom sensors. An LED indicator in this board is used to indicate the heartbeat rhythm of humans. The AD8232 ECG module comprises a function like quick restore used to decrease the length of long resolving tails of the HPFs. As we know corona virus and other viruses are dangerous and harmful for the society with the help of this system we can keep a track on patients' body condition if they need any medical help we can alert the respective authorities on a press of button. Sample paragraph Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and RMS do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

II. COMPONENTS

1. ATMEGA 328

The Atmel ATmega328P is a 32K 8-bit microcontroller based on the AVR architecture. Many instructions are executed in a single clock cycle providing a throughput of almost 20 MIPS at 20MHz. The ATMEGA328-PU comes in an PDIP 28 pin package and is suitable for use on our 28 pin AVR Development Board.

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Features of Atmega 328

High Performance, Low Power AVR 8-Bit Microcontroller

- Advanced RISC Architecture.
- 131 Powerful Instructions
- Most Single Clock Cycle Execution
- 32 x 8 General Purpose Working Registers
- Fully Static Operation
- Up to 20 MIPS Throughput at 20 MHz
- On-chip 2-cycle Multiplier

Flash Program Memory: 32 kbytes

EEPROM Data Memory: 1 kbytes

SRAM Data Memory: 2 kbytes

I/0 Pins: 23

Timers: Two 8-bit / One 16-bit

A/D Converter: 10-bit Six Channel

PWM: Six Channels

RTC: Yes with Separate Oscillator

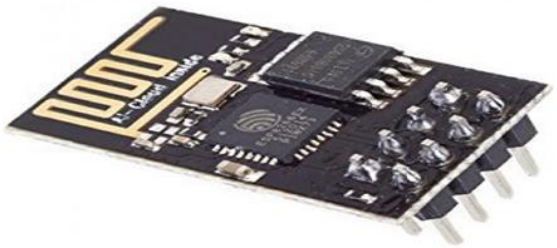
MSSP: SPI and I2C Master and Slave Support

USART: Yes

External Oscillator: up to 20MHz

2. WiFi Module

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wifi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.



3. Heart Beat Sensor

Use our Heartbeat sensor to measure the Heart Rate or pulse rate of a person. Heart Beat sensor measures the heart rate through the fingertip. This Heart Beat Sensor provides an easy way to integrate heart rate measurement.

When the heart beats it pumps blood into your artery of your finger tip. This causes a change in the blood volume which is then sensed by our Heart Beat sensor. The sensor used infrared light source on one side of finger and a photo detector on another side to measure this change in the blood flowing. As the blood flow changes the intensity of light following on the photo diode varies and the on board instrumentation provides a PPG waveform. This PPG waveform is synchronous with the heart beat.

4. Blood Pressure Sensor

Blood Pressure & Pulse reading are shown on display with serial out for external projects of embedded circuit processing and display. Shows Systolic. Diastolic and Pulse Readings. Compact design fits over your wrist like a watch. Easy to use wrist style climinates pumping.

Features:

- Intelligent automatic compression and decompression
- Easy to operate, switching button to start measuring
- 60 store groups memory measurements
- Can read single or all measures

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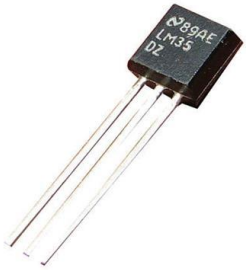
5. Temperature Sensor

LM35 series are precision integrated-circuit temperature sensors with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin. As the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling.

Features:

- Calibrated Directly in Celsius (Centigrade)
- Linear + 10-mV/°C Scale Factor
- 0.5°C Ensured Accuracy (at 25°C)
- Rated for Full -55°C to 150°C Range
- Suitable for Remote Applications



6. Liquid Crystal Display (LCD)

7. ESP32 Module

ESP32 is a series of low-cost, low-power system on chip microcontrollers with integrated Wi-Fi and dual-mode Bluetooth. ESP32 is created and developed by Espressif Systems, a Shanghai-based Chinese company, and is manufactured by TSMC using their 40 nm process. It is a successor to the ESP8266 microcontroller.

8. ECG Module

The AD8232 ECG Module is a cost-effective board used to measure the electrical activity of the heart. This electrical activity can be charted as an ECG or Electrocardiogram and output as an analog reading.

V. ADVANTAGES

1. Increased patient comfort and convenience.
2. Enable better patient satisfaction and faster recovery times.
3. IOT healthcare devices, wearable technology and data access allow physicians to monitor patients with greater precision and provide better informed treatment.

VI. APPLICATIONS

1. Hospital, home care unit, sport.
2. Hospitals it monitoring the Heart Beat and Temperature continually. By using this system the patient can be analyzed by doctors in any part of the hospital.
3. Used to transfer the information from the transmitter side to the receiver side wirelessly.

VII. CONCLUSION

With the help of this we are saving doctors life and also we are saving our lives from covid infection

This System allows:

- To monitor patients remotely without risk of infection by the doctors.
- One doctor cam monitors 500 patients at a time.
- Instant alert in case of health fluctuations of emergency to the doctors. The system is setup at covid patient bedside and constantly transmits patient health data over the active internet so that doctors can monitor multiple patients remotely and attend the desired patient urgently when an emergency is required.
- This research paper aims at initial prototype development for wireless transmission of ECG signals. It is evident that designing such a system will help in early detection of abnormal conditions of cardiovascular diseases and prevention of its serious consequences.

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REFERENCES

[1] Iman, Auburn University, "Tensor Beat Tensor Decomposition for Monitoring Multi-person Breathing Beats With Commodity WIFI" ACM Transactions on Intelligent Systems and Technology, Vol.5, No.2, September 2017.
[2] Sebastin, Member, IEEE, "Heart Beat and Respiration Detection from Optical Interferometric Signals by Using a Multi method Approach" IEEE Transactions.
[3] M. A. Kumar and Y.R. Sekhar, "Android Based Health Care Monitoring System", 2nd International Conference on Innovations in Information Embedded and Communication Systems, ICHECS, IEEE, 2016.
[4] Rajeev Gupta, Indu Mohan, Jagat Narula: Trends in Coronary Heart Disease Epidemiology in India, Volume 82, Issue 2, March–April 2016, pp 307-315.
[5] Muhammad Wildan Gifari; Hasballah Zakaria; Richard Mengko: Design of ECG Homecare: 12-lead ECG acquisition using single channel ECG device developed on AD8232 analog front end, The 5th International Conference on Electrical Engineering and Informatics 2015 August 10-11, 2015, Bali, Indonesia, 978-1-4673-7319-7/15/$31.00 ©2015 IEEE, pp 371-376.
[6] AD8232 Datasheet, Analog Devices.

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