EasyChair Preprint

№ 7543

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March 12, 2022

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Abstract:

A pulse oximeter is a piece of medical equipment that analyses the quantity of oxygen concentration in a person's bloodstream, i.e., what proportion of the oxygen-carrying molecules known as haemoglobin) simply transport oxygen around the body. Pulse oximetry is based on the assumption that two wavelengths may be utilised to make arterial blood oxygen choices, assuming that the observations are done on the pulsatile component of the signal. Traditional pulse oximeters employ two leads at varied wavelengths and a phototransistor to estimate blood oxygen content without being intrusive, defined as the variation in coefficient of reflection between hemoglobin and deoxyhaemoglobin. Here we proposed a self quarantine system to monitor the condition of the patient remotely using cloud technology. The system monitors the temperature and Spo2 level continuously and upload it to a private server in certain interval of time. So, the doctor or caretaker can view the condition of the patient remotely.

Keywords: Cloud server, Covid monitoring system, Spo2, Oxygen saturation, Self-quarantine.

Introduction:

Like most viruses, Corona is transmitted when an infected person coughs or sneezes on someone else. But there’s a twist: You can also become infected by breathing in Corona-infected sweat particles. That’s why the U.S. government recently enacted a nationwide lockdown. The goal: to keep infected healthy people in their homes until the virus has run its course.

Background Information About Coronavirus, Lockdown, and Quarantine Background information about the coronavirus, the current lockdown, and the quarantine. Introduction to the Topic Background on Coronavirus Background on the current lockdown Background on the quarantine Current State of the Situation The current lockdown is still in place and there is

no information from the government about when it will be lifted. The government has also not given any information about the cause of the lockdown. Current Quarantine The government has set up quarantine stations in certain areas of the country.

Covid 19 is a fully-automated, on-demand oxygen delivery and treatment system designed to quickly provide life-saving treatments to patients in emergency situations. Developed and built by team members at Aethlon Medical, Covid 19 uses a unique combination of advanced artificial intelligence and 3D printing to deliver targeted doses of oxygen to patients with few or no symptoms of hypoxia. Covid 19 is capable of delivering high-quality oxygen to patients in a fraction of the time required by traditional treatments. The Covid 19 system is able to provide a continuous supply of oxygen to patients without interruption, reducing the burden on emergency responders and hospitals.

Oxygen is the most common element in the universe, making up more than twenty-eight percent of the entire mass of the planet Earth. It's also one of the most abundant elements in the human body, making up roughly twenty percent of your mass. The most common type of oxygen we encounter is molecular oxygen – this is the stuff we breathe on a daily basis. But molecular oxygen is only one type of oxygen; there's also a different type of oxygen that's only found inside living organisms, and another type of oxygen that's only found in the environment. So here the proposed system uses WSN oxygen saturation monitoring of the patient to monitoring. Pulse oximeters have become an essential approach for healthcare management, ranging from emergency departments and clinic hospital beds to sleep disruption diagnosis in the clinical household. They use photoplethysmography to determine the quantity of oxygen in the blood stream non-invasively (SpO2).

Literature Review:

In this study [9], we present a cheap IoT-based system aimed for increasing COVID-19 indoor safety by encompassing numerous key factors such as contactless temperature monitoring, mask detection, and social distancing check. The contactless temperature sensing subsystem is powered by an Arduino Uno and an infrared sensor or a thermal camera, while mask recognition and social distance checks are handled by computer vision algorithms on a camera-equipped Raspberry Pi.

This study [10] discusses how the Internet of Things (IoT) may be integrated into the epidemic prevention and control system. We show a potential fog-cloud combined IoT platform that can be used in the systematic and intelligent COVID-19 prevention and control, which includes

five interventions: COVID-19 symptom diagnosis, quarantine monitoring, contact tracing and social distancing, COVID-19 outbreak forecasting, and SARS-CoV-2 mutation tracking [11].

Based on this backdrop, the authors previously presented an IoT-based healthcare infrastructure to allow remote monitoring for patients in critical situations. As a result, the purpose of this article is to broaden the platform by including wearable and inconspicuous sensors to monitor patients with coronavirus illness. Furthermore, we describe a real-world use of our technique in a COVID-19 critical care unit in Brazil [12].

For classifying COVID-19 patients, researchers presented a variety of Machine Learning and smart IoT-based methods. Artificial Neural Networks (ANN) are commonly utilised in a variety of applications, including healthcare systems, and are inspired by the biological idea of neurons. In the decision-making process for handling healthcare information, the ANN scheme provides a suitable option [13].

This study [15] proposes a new approach of detecting Covid-19 fever symptoms based on IoT cloud services to address the longer time delay of monitoring packed customers who enter public or private agencies, which can lead to a risky field for disease propagation. A realistic experiment is used to design an autonomously checking procedure [15].

Proposed methodology:

Pulse oximetry is a typical medical measuring equipment that monitors the concentration of oxygen saturation in our circulation and can detect minute fluctuations in oxygen. It is a non-invasive and painless test. It is vital in the current Covid-19 scenario to monitor patient the oxygen saturation of several patients who required without getting into close contact with patients.

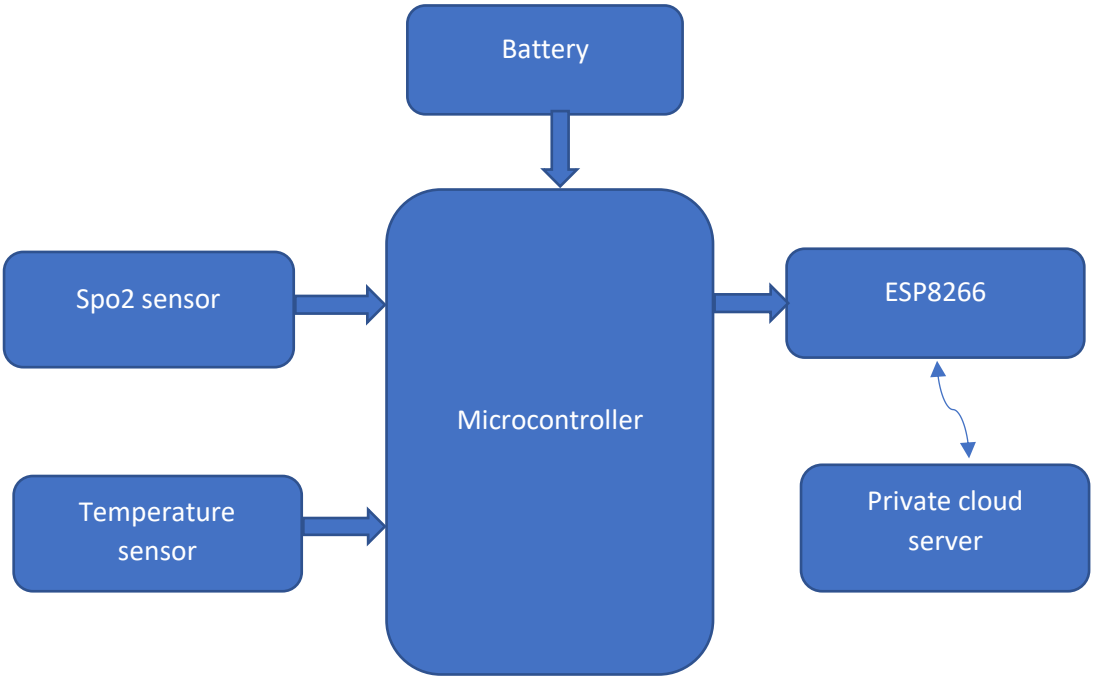

Figure 1: Proposed model

In this paper, we presented a self-quarantine system that uses cloud technologies to remotely monitor the patient's status. The system continually checks the temperature and Spo2 level and uploads it to a private server at regular intervals. As a result, the doctor or caregiver can monitor the patient's status from afar.

Pulse oximetry is a noninvasive medical test that uses light to measure the amount of oxygen in the blood. It's used to monitor the oxygen levels of people who are unable to breathe on their own, such as those with breathing disorders, lung diseases, or cardiac arrest. The test is painless, requires only a few seconds of exposure to bright light, and is frequently given without the patient's knowledge. You can perform a pulse oximetry test at home using a device called a pulse oximeter.

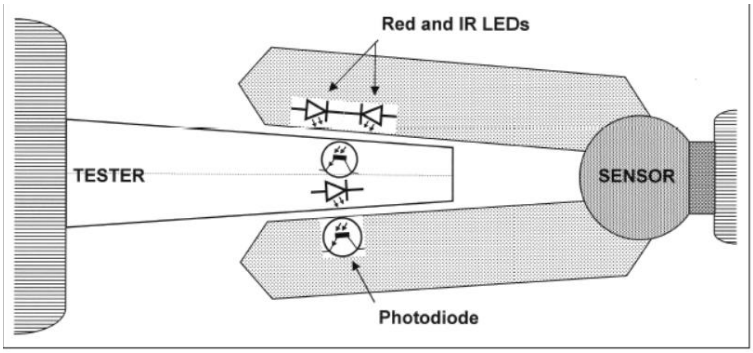

Figure 2: Spo2 working

However, when used on patients with certain medical conditions, such as hypoxemia, pulse oximetry can provide vital information that can help doctors better understand and manage their condition. Because of their ability to provide real-time oxygen level data, pulse oximeters have also become an important tool on the battlefield and in first aid kits.

The most common method of pulse oximetry is through the use of a small probe called a sensor, which is placed on a patient's finger, toe, or earlobe. When the sensor is placed on a patient's body, it emits small amounts of red and infrared light. The amount of red and infrared light that is absorbed by the tissues in the body is then measured by a device called a pulse oximeter.

Results and Discussion:

The world of healthcare is changing. Patients now have more control over their healthcare than ever before, and this means that they can also make decisions about their care. One of the biggest healthcare decisions that patients can make is where they want to be treated. Some patients want to be treated at home, while others prefer to be treated in a hospital or care facility.

Covid Health is a telemedicine platform that allows patients to access healthcare from the comfort of their homes. One of the ways we help our patients is by providing them with access to our MV telemedicine platform, which allows them to video chat with our doctors and specialists who can diagnose them and prescribe them medications. One of the ways we help our patients is by providing them with a temperature sensor that can be used to monitor their body temperature, especially in cases of suspected infection. This allows our doctors to proactively prescribe antibiotics and other medications, which is especially important for patients who don't have access to urgent care or don't want to go to the doctor for every little thing.

Figure 3: Cloud result

As demonstrated in Figure 3, we may use the blynk app to capture individual sensor data and input it into the cloud server. The hospital management server database can monitor this data. These are all IoT-connected and can be an effective means of gathering data from patients.

This research resulted in a graph for that particular design of the SPO2 transmitters and display. This is referred to as an R-curve.

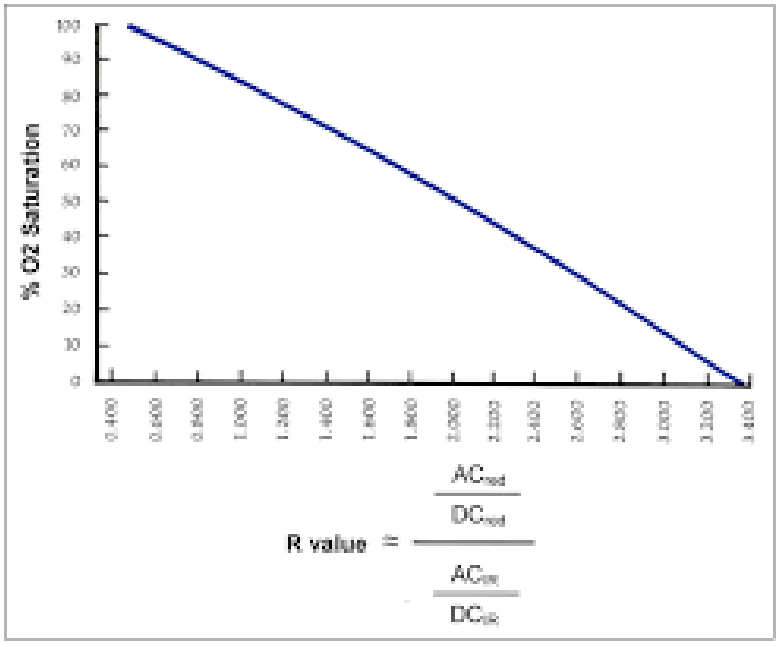

Figure 4: Spo2 saturation

An R-curve is defined as the correlation between the fundamental ratio of red and near-infrared light versus the observed oxygen levels acquired during human testing, as shown in Figure 4. The R-curve is then utilised in the framework for a specific item and for SPO2 testers.

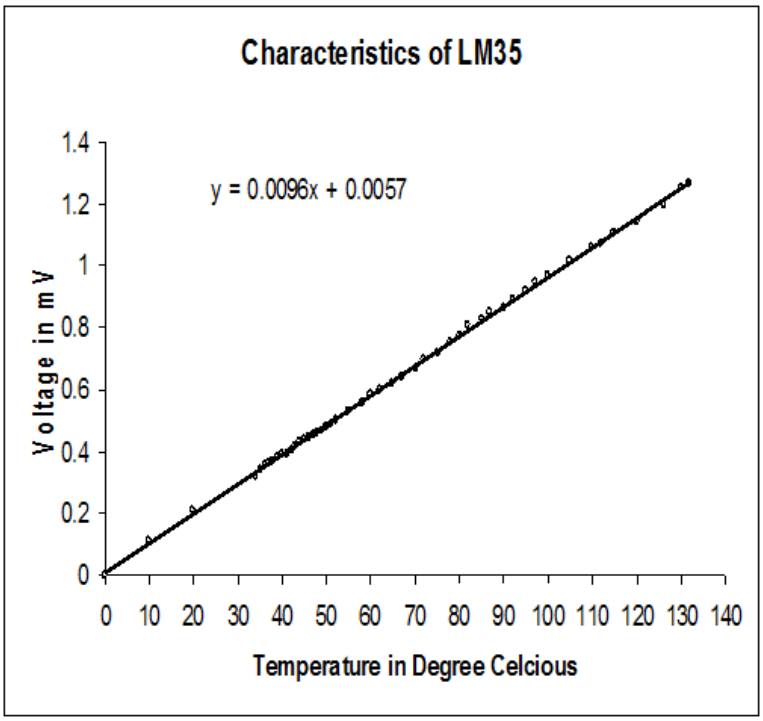

Figure 5: Temperature vs voltage

The temperature of most devices, be they electronic or otherwise, is measured in degrees Celsius. However, many electronic devices have a temperature sensor on them which is measured in degrees Kelvin. The difference between the two is simple enough: one is absolute, the other is relative. In the Fahrenheit scale, zero degrees is the freezing point of water, 100 degrees is the boiling point of water. Figure 5 shows the graph representation of temperature and voltage.

Conclusion:

Self-quarantine is much needed for nowadays to reduce the transmission of the virus. Pulse oximetry is predicated on the notion that two wavelengths can be used to determine arterial blood oxygen levels, given that the measurements are made on the pulsatile component of the signal. The established IoT Enabled Pulse Oximeter has proven a moderate success when compared to conventional Pulse Oximetry and Pulse-Rate equipment. As a result, we have thoroughly validated and tested our objective of making the gadget functional and small. Even faraway physicians can assess a patient's health by checking the outcome from the cloud using

an internet connection. We introduced a self-quarantine system that employs cloud technology to remotely monitor the patient's state in this research. At regular intervals, the system monitors the temperature and Spo2 level and transmits it to a private server. As a consequence, the doctor or caregiver can keep an eye on the patient's condition from afar.

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