

HUMAN TEMPERATURE, PULSE RATE AND OXYGEN MONITORING SYSTEM

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ABSTRACT

Now-a-days there become many changes in the healthcare system. So many new systems are invented for checking and observing the people. As we know that "Prevention is always better than Cure" it is the need to monitor the health of an individual staying at home so that a person is prevented from the danger of fatal diseases. Now a day corona virus is a dangerous virus spreads all over the world, having visible symptoms of high temperature, breathing problem, low oxygen level. by using this device any one check its own temperature and oxygen. So that low level of oxygen and high temperature can be check regularly. Not only for covid-19 patients but it can be also useful for other heart patients to help in reducing the frequent visits to the clinic and also help in early diagnosis of dangerous diseases.

Keywords: Oxygen level, body temperature, heart rate.

I. INTRODUCTION

The leading cause of death worldwide is heart disease. The heart's job is to pump blood to all regions of the body via veins and arteries. Many chemicals or elements, such as oxygen in blood HbO₂, are present in the blood (oxyhemoglobin). The goal of this research is to create a system that can assess changes in voltage fluctuations to the transducer (photoplethysmography), oxygen saturation, and body heat changes. We will see the parameters to be check on this system

Temperature

Normal human body temperature is a concept that depends upon the place in the body at which the measurement is made, and the time of day and level of activity of the person. There is no single number that represents a normal or healthy temperature for all people under all circumstances using any place of measurement. The commonly accepted average core body temperature (taken internally) is 37.0 °C (98.6 °F). The typical oral (under the tongue) measurement is 36.8±0.7 °C, or 98.2±1.3 °F. From the home to the hospital and everywhere in between large number of people rely on digital thermometers to take fast, accurate reading of a patient's body temperature.

Oxygen saturation

The ratio of oxhemoglobin to the overall concentration of haemoglobin in the blood is known as oxygen saturation. A molecule of haemoglobin can only carry four oxygen molecules at a time. The oxygen saturation level would be 90% if 2000 haemoglobin molecules each carried 8000 oxygen molecules. The oxygen saturation level of a patient's body is measured using an instrument.

Heart rate

For an adult, a normal resting heart rate ranges from 60 to 100 beats per minute (bpm). For a

well-trained athlete, a normal resting heart rate may be as low as 40 to 60 bpm. A lower resting heart rate in healthy persons indicates more efficient heart function and improved cardiovascular fitness. Simply check your pulse at home to determine your heart rate. Place two fingers on the thumb and the third finger on the side of your windpipe on your neck. Look at your watch and count the number of beats in 15 seconds when you feel your pulse. To get your heart rate per minute, multiply this value by four.

II LITERATURE SURVEY

Care of critically ill patient, requires spontaneous & accurate decisions so that life-protecting & lifesaving therapy can be properly applied. Statistics reveal that every minute a human is losing his/her life across the globe. More close in India, everyday many lives are affected by heart attacks and more importantly because the patients did not get timely and proper help .now a day's Corona virus is a virus that has spread around the world. This paper is based on monitoring earlier symptoms of covid 19 which are high temperature, high pulse rate. In the field of health monitoring the current most important user groups are those aged 40 and more. The group of 40+ users shows more diversity in their health conditions than younger people.THERE ARE MANY INSTRUMENTS IN THE market to check tempeture and pulse rate.but when a person goes to doctor than a nurse or doctor can check the person. This may take some time. In order to make self monitoring the system can be used to monitor parameters, such as temperature and heart rate, of a human subject. The system consists of an electronic device having several sensors to measure different vital signs; the person is monitored within his own home. This device senses the person's temperature and heart rate and displays it. So it is easy to take the readings. Currently there are number of health monitoring systems available for the patients. The available systems are huge in size. To visit to the hospital Regular for a patient is not possible once he/she is discharged from hospitals, or he/she is more aged or because of spreading virus. These systems cannot be used at home. So to overcome limitations of systems I have proposed a new system. This system is able to check the parameters of patient and if the condition is critical than only go to the hospital, and if the readings are normal then they not to worry

III. PROPOSED SYSTEM DESIGN

The system can monitor the human temperature, oxygen and heart rate. It uses a lcd display the data. The structural frame of the system is shown in Figure 1.A cortex m3 processor is used for processing the data. The system having two inputs one is temperature sensor and pulse oxymeter In temperature sensor a black thermister is used to sense the human body temperature. By a touch it senses the temperature and displays it on lcd. Pulse oxymeter measure heart rate and oxygen level of the person and display on the lcd,a16by 2 lcd display is used to show the data.

ARM Cortex-M3 RISC processor

The SAM3X/A series from Atmel is part of a family of Flash microcontrollers based on the ARM Cortex-M3 RISC CPU, which is a high-performance 32-bit processor. It has an 84 MHz maximum speed and up to 512 Kbytes of Flash and 100 Kbytes of SRAM. A High Speed USB Host and Device port with embedded transceiver, an Ethernet MAC, 2x CANs, a High Speed MCI for SDIO/SD/MMC, an External Bus Interface with NAND Flash controller, 5x UARTs, 2x TWIs, 4x SPIs, 1 PWM timer, 9x general-purpose 32-bit timers, an RTC, a 12-bit ADC, and a 12-bit DAC are among the peripherals.

Hardware design

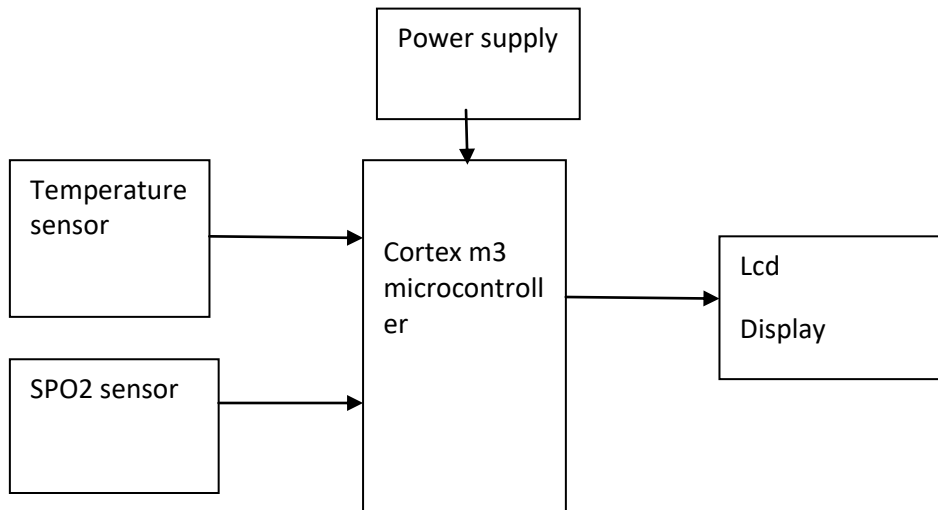


Figure1. BLOCK DIAGRAM OF SYSTEM

Temperature sensor

This is a Negative Temperature Coefficient Resistor Whose resistance changes with ambient temperature changes. Thermistor is a compressed combination of two or four types of metal oxides of iron, nickel, cobalt, manganese and copper, get shaped and Sintered at high temperature (1200°C to 1500°C). In this system the temperature sensor get analog output. Whenever a person touches the sensor it it will changes the resistance of the sensor as per the body temperature of the person. In normal weather human body temperature is 36.5 to 37 degree c. So as temperature changes resistance changes. This resistance will be converted into voltage and then calibrated into degree temperature. Thus we get a digital reading of temperature in degree Celsius on display. So a person can easily get his/her temperature.

Pulse Oxymeter

To measure pulse rate and oxygen level of the person an integrated pulse oximetry and heart rate monitor sensor is used. It detects pulse oximetry and heart rate signals using two LEDs, a photodetector, improved optics, and low-noise analogue signal processing. It runs on 1.8V and 3.3V power sources and can be turned off by software with very little standby current, allowing the power supply to be connected at all times. Whenever a person touches the sensor it measure the heart beats as well as the level of pick .a normal human heart rate is 70 to 80 and oxygen level is 95 to100. after getting all these data the system will display this information on lcd display. A general block diagram of the system is as shown below.

IV. FLOW CHART OF SYSTEM

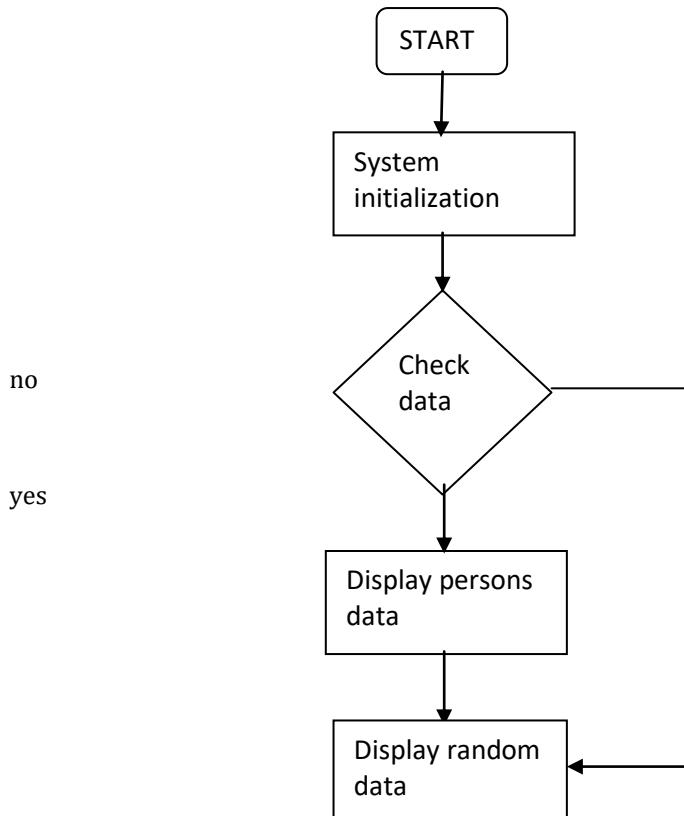


Figure2. FLOW CHART OF THE SYSTEM

Above figure shows the flow chart of the system. When a person touches the sensors it will display the data on lcd display.

V. RESULT

The final result of the system is we get a person's heart rate, body temperature and oxygen level on the display. A sixteen by two display is used to show the data, on that digital reading are displayed so anyone can easily detect and read the parameters. By checking the readings of parameters one can detect patient's health But, if the readings are not in normal range then a person can immediately visit to the doctor. As shown in picture 1 three parameters are displayed where T is temperature, HR is heart rate and SPO2 is the oxygen level.



Picture1.DISPLAY OF DATA

VI. SUMMARY

This technology allows for the monitoring of several physiological signals as well as the display of data in real time. The system developed in this study was able to work according to the plan, measuring heart rate, blood oxygen saturation, and body temperature. When the tool is turned on for about 10 seconds, the sensor reaction time is average.

VII. REFERENCES

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