

WEARABLE C-19 TRACKING AND MOBILE HEALTH MONITORING SYSTEM

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Abstract— In recent times, the rate and risk of covid-19 has increased. People are getting affected in this pandemic without maintaining proper social distancing and feeling scared of going hospitals for their regular checkups. Also India being one of the top populated country, maintaining distance from one another in work place or a social environment makes it still more difficult. To achieve effective measures for this situation the proposed method helps in maintaining 1.5 to 2-meter distance from others, if the distance becomes below 1.5-meter vibration is initiated and an alert is sent to user's mobile phone with the help of Pyroelectric infrared sensor, Arduino and GSM. This also monitors the body temperature of the person frequently and help to keep in track of the health condition. The main advantage of this proposed system is that, it not only helps during covid period but can also be used as a portable health monitoring device to check heartbeat rate and temperature in daily basis. This feature allows acquiring vital data during different daily activities, ensuring a better support in medical diagnosis and helping in a better and faster recovering from a medical intervention.

Keywords—Arduino, PIR Sensor, GSM module, Temperature Sensor, Vibration motor.

I. INTRODUCTION

As pandemic is declared all around the world due to covid-19 and the rate of affected people is constantly increasing. There is a need of reminder for people to maintain social distancing and monitor their health frequently. Also to ensure a better support in medical diagnosis and for faster recovery, leading to embedded automation. Helping people to monitor their health status both at an activity/fitness level for self-health tracking.

One way of limiting the spread of an infectious disease, for instance, Covid-19, is to practice social distancing. This is not a new concept, as most societies have been aware of the value of keeping away from people who are suffering from an infection for many generations. The motive is to decrease transmission and to delay the pandemic peak, and spreading cases for a longer time to reduce pressure on the healthcare system. It has been recommended that maintaining a social distance of 2-metres between people is one way to reduce the amount of spread of COVID-19. Knowing if you are 2-metres away from another person at any given point in a school day can be difficult. In this Design & Build a wearable prototype that would help to enforce this recommendation during the school day.

II. RELATED WORK

The Intensive Care Unit (ICU) ward circumstance will in general be extremely exceptional since the patients who are set in the wards are normally basic condition patients. These patients need a serious consideration by the medical caretakers and doctor since their condition are not entirely steady. Accordingly, the medical caretakers and doctors need to screen them exceptionally successive. Along these lines, the possibility of this checking framework is primarily to facilitate the attendants work by lessening observing recurrence. This checking framework additionally intentionally worked to make them alert about their patient hence, can limit the danger of patients who are observed. This observing framework is utilizing the

microcontroller (Arduino Uno) which is associated with the PC through Bluetooth to move the information of pulse and internal heat level of the respondent. This information was sense through Heart-Rate Grove sensor and LM35 temperature sensor. The information were prepared and shown on the PC for consistently persistently. Diverse shade of LED was utilized as a pointer to tell the state of the respondent's heartbeat or internal heat level possibly it was in high or low condition as a notice.

For youthful grown-up with fever respondent, it shows the consequence of 81 bpm of pulse and 37.63oC of internal heat level with 3.83% and 0.65% of the Mean Absolute Percent. This monitoring system has successfully built and able to display the data of the heart rate and body temperature of the respondent for every minute and able to facilitate autonomous monitoring tasks in the future.

III. EXISTING METHOD

Implemented by object detection using CCTV and drones. Pulse and temperature is monitored via Bluetooth connection. Display is used to show results. By using CCTV and drones, alert cannot be given personally. Chances of failure of connection in terms of Bluetooth. Displaying of results at time, cannot be used for future medical diagnosis. Some of these devices are not portable.

IV. PROPOSED SYSTEM

It is automatically enabled system using PIR sensor. This proposed method provides effective measures to maintain proper social distancing. It is also used in monitoring health with help of biosensors like pulse and temperature sensors. No need of different devices, since PIR sensor is integrated with biosensors it helps in monitoring health and maintain distance at same time. It can be designed as a wearable device. Results can be sent to user's mobile phone through GSM. Real time alert is initiated using vibration motor.

V. BLOCK DIAGRAM

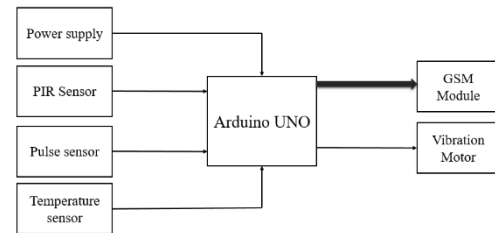


Fig 1: Block Diagram for Proposed System

VI. WORKING PRINCIPLE

The working of the Automatic tracker and Mobile Health Monitoring system is done using Arduino Uno, PIR sensor, Temperature sensor, Pulse sensor, Vibration motor and GSM module. By connecting external power supply to the Arduino it gets powered on and waits for the PIR sensor to be calibrated. The PIR (Pyroelectric Infrared Sensor) Sensor, which is attached to Arduino, detects infrared light radiation and decides if a person has entered or exited the sensor range of 1.5–2m. As the human body moves in that area, it enters a specific field of view and then walks out of it in a specific order. The pyroelectric signal detects the movement of the human body. This pin value will be set to “1” if the sensor senses any motion.

The two potentiometers on the board allow you to change the sensitivity and delay time after detecting a movement, and the vibration motor generates an output signal as a warning signal.. This vibration motor contain a transistor is” switched on” when there is voltage above the transistor’s threshold voltage applied to the gate. we are essential turning the motor on when set pin 6 to HIGH and turning off when set to LOW, with our current setup this will connect our 3v vibration motor to a 5v supply.

Instead we will use PWM to reduce the applied voltage The temperature sensor used here is LM35 temperature sensor used to measure the body temperature. It is an integrated-circuit temperature device with an output voltage linearly proportional to centigrade temperature. It has an advantage over a

linear temperature sensor calibrated in kelvin in that it does not require the user to subtract a large constant voltage from the output in order to scale in centigrade.

To provide typical accuracies at room temperature to temperature range, this system does not need any external calibration or trimming. The pulse sensor is used to track the rate of your heartbeat. pulse sensor has two surface, first surface is light emitting diode and second surface is connected which is accountable for noise cancellation and amplification. LED is located above the vein in human body, once it is located on the vein then led starts emitting light. Once heart is pumping, then there will be flow of blood within the veins. If we check the blood flow, then we can check the heartbeat rate. When the blood flow is sensed, the ambient light sensor will receive more light than the examined over time to decide our pulse rate and gives an output through GSM. The GSM module is a cellular module which is used for transmission, sending and receiving SMS and receiving voice calls. In this module the switch will be connected digital pin 8 of Arduino as an input. after detecting the pulse and temperature sensor, the Arduino will communicate with GSM module by using AT commands and send the "message" to the user's mobile number.

VI. EXPERIMENTAL RESULTS

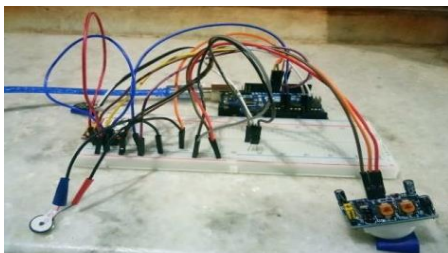


Fig 2: Experimental setup

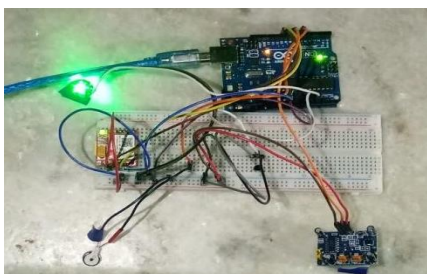


Fig 3: Experimental setup of activated device

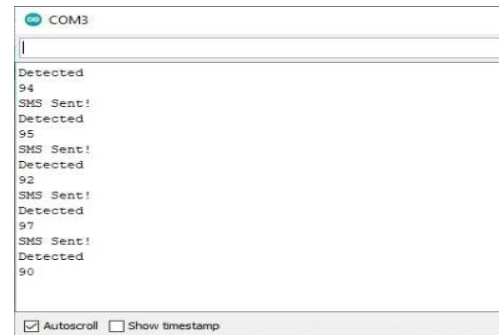


Fig 4: software output

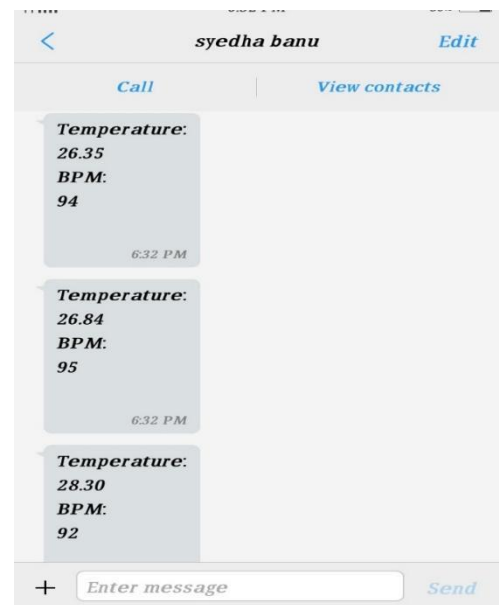


Fig 5: Alert Message to mobile phone

VII. CONCLUSION

This project involves the prototype design of a healthcare device. The main functions the mobile health monitoring system is that it monitors the distance to avoid close contact from the affected people and alerts the respected person using the device. The sensors used in this system is used to measure the body temperature and heartbeat rate of the person using the device. The parameters measured are sent to the persons mobile using GSM module.

This type of project can be used in medical fields for monitoring health care in an effective way. The use of Arduino makes this project more convenient and user friendly in terms of cost efficiency and complexity in building. This prototype is designed in a way which it consumes very low power of 3V - 5V. Arduino is used to run and control the entire system. PIR (Pyroelectric infrared) sensor is used detect the human motion by the changes in the amount of infrared radiation reflected from the surface which triggers the detector and send signal to Arduino.

The coin vibration motor receives the input from the Arduino, then shaft in the motor starts vibrating in-order to send the alert. The LM35 senses the body temperature by the voltage difference across the diode terminals present in the sensor. The pulse sensor measures the heartbeat rate of the person by calculating the difference in the wavelength of light emitted from the led of the pulse sensor. GSM module is used as communication network to receive the measured parameters as a result of the system.

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