

Auto Sanitization and Temperature Testing

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Abstract

COVID-19 is a widespread viral disease that has caused enormous loss of the populations around the world. The virus specially targets the respiratory organs like lungs. The spreading of virus starts with the droplets of the infected person's sneeze, cough or breath which might be present in the air or any other surfaces. If this virus comes in contact through either nose, eyes or ears will give a passage for it to the mucus membrane and down to the throat. After 2 to 14 days the person may show few symptoms like itchy throat, cough, increase body temperature (fever), breathlessness etc, So as precautionary measure protecting our nose with face masks is essential, with sanitizing hands and monitoring the body temperature from time to time.

This project aims to build a completely automated and a contactless way of approach to follow the standard operating procedures. The design of the model does not involve any human; hence the people are subjected to no risks. Our project also enables a database to store details of individual temperature along with their name and time

1. Introduction

Generally while travelling in metro we have observed 1-2 people sits at the gate to check your temperature and sanitize your hands and bags as a covid precaution. In times like these such necessary precautions has to be followed properly for everybody's safety. But it is not followed efficiently and properly so we are going to digitalize the same process using our project. It will measure your temperature, check for your mask and will sanitize your hands and bags before entering and will only allow you to pass the gateway after taking all necessary precautions and only if your body temperature lies in the normal range.

This way the process becomes more accurate and efficient.

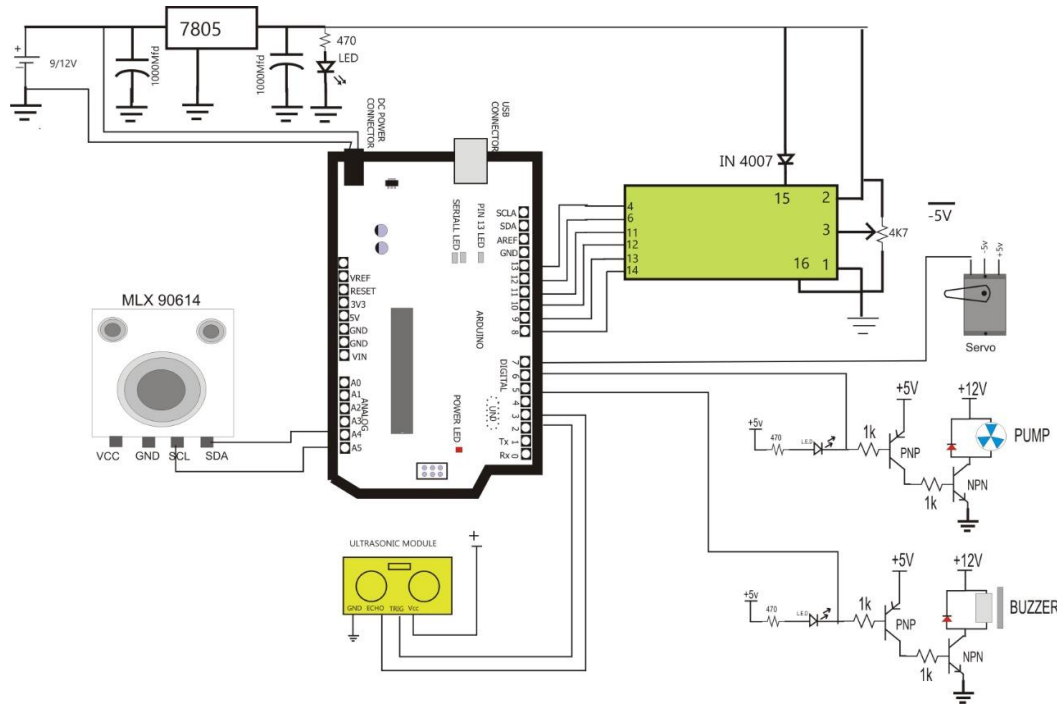


Fig.

2. Related Work

In this project we aim to build an all in one and cost-effective contactless monitoring system for any organization with a built in a sanitizer dispenser, mask detecting system and temperature sensing system which records the temperature of every individual and then store into a database. This model eliminates the dependency of a human to monitor standard operating procedures and record the data on a daily basis which can be used for future references for contact tracing, etc. It is a contactless and fully automated system which reduces the risk of the infection spread.

3. Methodology

The idea for this project was conceived by witnessing the rapid spread of Corona virus diseases also known as Covid 19 across the world which emerged in December 2019. The disease spread has infected massive amount of people and caused tremendous loss of population in the year 2020, stepping to 2021 as well. The major symptoms of this disease are breathlessness and high temperature. It infects the respiratory organs like lungs thereby causing shortness of breath followed by high temperature or fever. It is need of an hour to prevent the spread of the virus further by following necessary steps such as -

Avoiding contact with surfaces

Sanitizing the palms and monitoring our temperature from time to time

Avoiding the touching of eyes, nose and ears when present in public

Most importantly wearing face mask to avoid direct contact with people and virus from entering the mucus glands.

[1] Measurement of Temperature and Humidity by using Arduino Tool and DHT11 In this paper the process is divided into 3 steps:

- The 1st process is to measure the temperature using DHT11 sensors
- The 2nd process is to extract the output of the DHT11 sensor output in Celsius scale.
- The 3rd process is displaying the temperature recorded on an LCD.

[2] Design and Development of Arduino Based Contactless Thermometer

Here Arduino UNO, MLX90614 temperature sensor, OLED Display and a battery is used for developing this system. The thermometer built here has a wide range of -70 to 380°C temperature measurement, has a resolution of 0.02 with an accuracy of 0.5°C and is accessed by 2 wire serial SM Bus compatible protocol. Unlike traditional thermometers, the proposed thermometer does not need any contact to measure the temperature.

When the Arduino is powered on, the MLX90614 measures the temperature of the body/object in its range. The range is provided by a led/IR light for accurate target of desired object or body. This temperature is displayed using OLED.

[3] Automated Social Distancing Gate with Non-Contact Body Temperature Monitoring using Arduino Uno

The incoming person's body temperature is measured using MLX90614ESF-BAA-000-TU-ND non-contact IR temperature sensor and the temperature is displayed on a 4x20 blue LCD as soon as IR sensor GP2YOA21YK detects the forehead at a distance of 150cm. A buzzer of 0.5 watt, 8 ohms is used to notify the detection of abnormal temperature i.e., 37.5 degree Celsius or above. Also, a speaker is used to indicate the same. MLX90614ESF-DCx versions of the infrared thermometer sensor can be used instead of MLX90614ESF-BAA-000-TU-ND for better accuracy.

[4] Design of a contactless body temperature measurement system using Arduino

Here an Arduino CT uno controller, a type of Arduino mega controller is used to monitor the temperature parameters. Two sensors LM 35 as S1 and MLX-90614 as S2 are used for temperature measurement. LM35 is a contact type sensor and gives a precise output in the range -55 degree C to 150-degree C. Whereas the MLX-90614 is a contactless sensor. The S1 senses the ambience temperature where output voltage is directly converted into temperature in Celsius and S2 senses the human body temperature through PWM output pins. The esp.-WIFI shield is a programmable microcontroller that is used to transfer and monitor the collected temperature data both wired and wirelessly and also displays the data in the online portal.

[5] RFID based Contactless Body Temperature Screening using Arduino and MLX90614 IR Temperature Sensor

When a person scans his RFID card, EM18 RFID Reader sends the data to the microcontroller Arduino nano, using UART communication. Now the temperature of the person is measured using a non-contact infrared thermometer using MLX90614 sensor. The temperature is measured only when the person is less than 25cm from the thermometer, an ultrasonic sensor is used for this purpose. This temperature is noted against the name read through RFID reader directly to an excel sheet.

This is also an attendance system which stores the temperature of every person. As this is not a completely contactless way of reading RFID tags, the possibility of spreading infection exists. Also, lack of RFID users in most of the places leads to lower number of users.

[6] Design of Automatic Hand Sanitizer with Temperature Sensing

Here there are two systems which work simultaneously, the first one is automatic sanitizer and second is the temperature sensing. The ultrasonic sensor PING SEN136B5B is used to detect the range of the human and the PIR sensor is used to monitor the motion of the human. The range of PIR sensors is 5 to 12m. Any detection of humans will activate the sanitizer pump1 and the sanitizer is sprayed and a blower is used to spread the sanitizer to the surroundings. Ultrasound sensor has a range less than 30m, any detection of human hand in that range will activate pump2 which sanitizes the hands using a DC motor.

Temperature sensor TMP 36 senses the temperature as soon as the contact is made, the sensor displays the temperature on the LCD display in Fahrenheit. A RGB led is made to glow green when the temperature is normal else it is made to glow red when the temperature is higher than normal and a piezo electric buzzer is used for the same.

The system has an efficient automatic sanitizing development but fails to provide a contactless temperature measuring unit, which can lead to spreading of infection.

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4. Result

The prime concern of the project is to provide a fully automated and completely contactless device for thermal scanning, sanitizing. The system built can reduce the spread of infection as it is contactless and automated, no human involvement is required hence can reduce the risk of spreading diseases. Also, a database is provided to trace an infected person and his contacts, so early precautions can be taken.

5. Conclusions

To build a hybrid temperature monitoring system with built in sanitizer which also automates the door control. A smart sanitizer system to ensure contactless way for cleaning hands, A mask detection technology, an automatic data updating system. An automatic door control is to be implemented.

To build an auto temperature monitoring system

To implement smart sanitizing system

To deploy automatic data updating system

To automate doors

To develop a hybrid contactless monitoring system

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