



Contactless Body Temperature Measurement and Screening Using Arduino

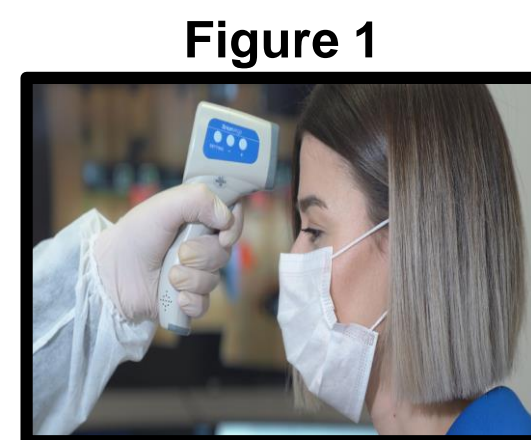
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BACKGROUND

Preventative health screenings and health assessments are being carried out by several countries in order to avoid the spread of COVID-19. Therefore, crucial sanitary measures held by governments to detect COVID-19 has been taking body temperature, in public and health establishments.¹



Credit: ComplyRight

Essential Safety Measures

Thermometers allow users to measure temperature in applications where conventional temperature sensors cannot be used since it is a medical device that allows immediate measurement of body temperature, without the need for direct contact. Hence, this will allow detecting anyone with elevated body temperature as a possible source of contagion and spread of these infections and viruses.²

Figure 2



Credit: IFL Science

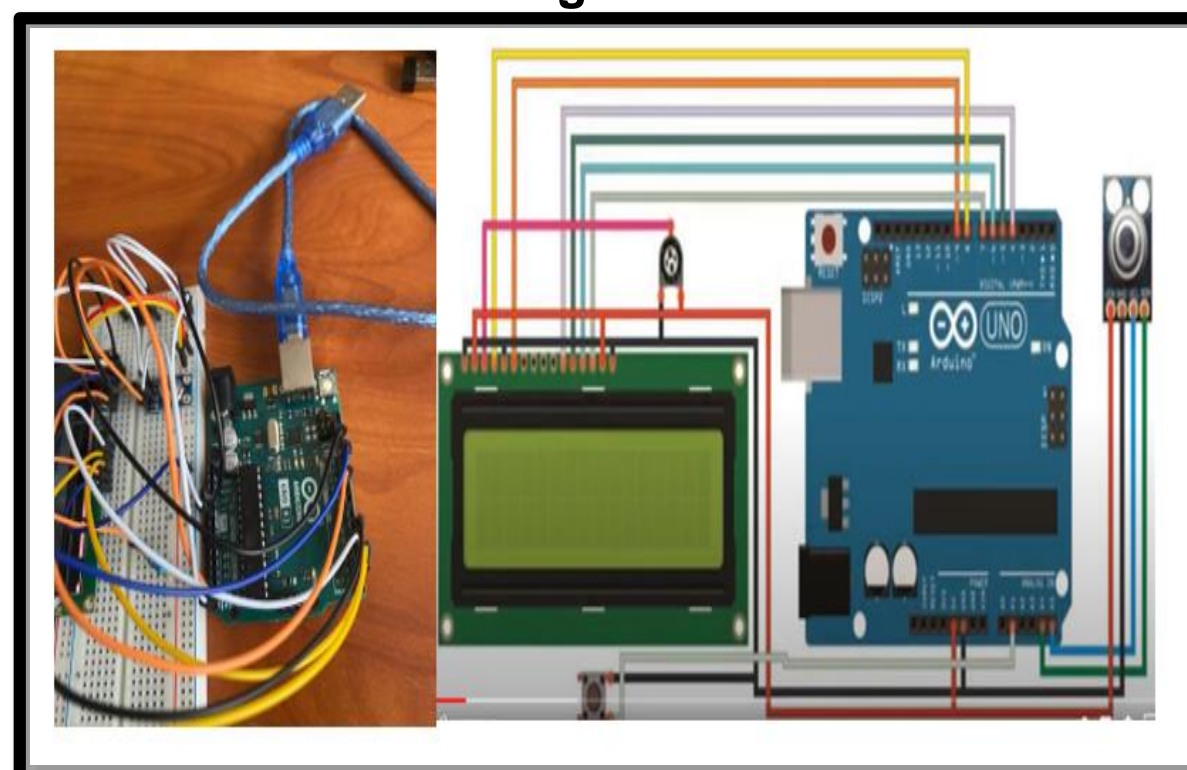
Inability to Monitor High Temperature

During a pandemic situation such as the current COVID-19 it is highly risky to measure temperature with conventional thermometers. Hence, with a touchless thermometer, we will be able to measure the temperature without having contact with the human body or the surface. This type of device will encourage people to keep social and physical distance.³

PROPOSED SOLUTION

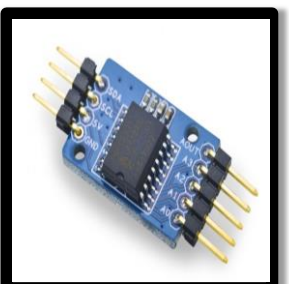
Fever is the main symptom that indicates a high viral or bacterial load in a certain disease, and one of the main alerts of our body's lack of ability to fight it. Our proposed solution consists of a non-contact infrared temperature sensor. Therefore, the equipment tends to measure the accurate body temperature from a safe distance with a very low risk to spread diseases or viruses, this is very functional since it will allow to detect anyone with elevated temperature.

Figure 3

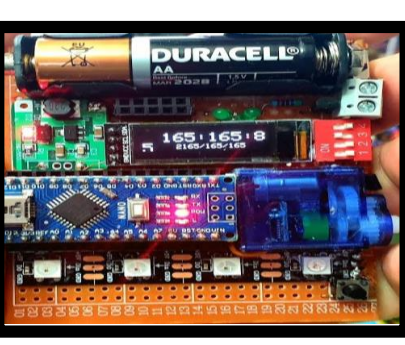


SYSTEM DESIGN

A/D Converter
An ADC is used to convert an analog signal such as voltage to a digital form so that it can be read and processed by a microcontroller.



Power Management
Our most effective power management was to have easiest access to AA batteries. To extend the life of the device, extending battery life to over 24 hours.



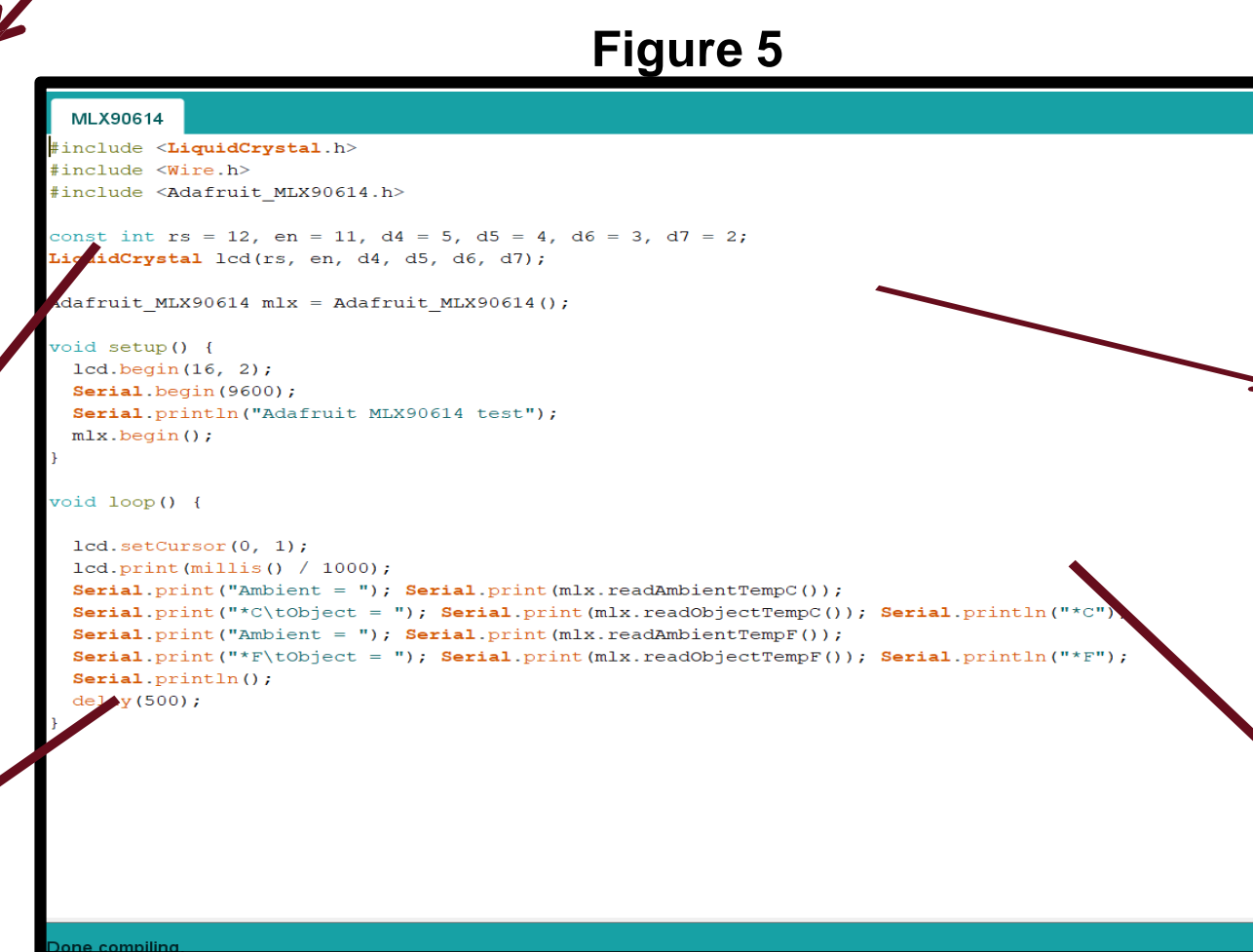
Software Development
Modes for temperature scanning and temperature capture are carried out separately along with switching from scan to capture or vice versa.

Identification Code
The program consists of two well differentiated parts, the front panel and the block diagram. The front panel is the interface with the user, allowing the user to view the data during its execution. On the other hand, the block diagram is the program itself, it contains the icons or blocks with different functionalities

Work Queues
The work queue organization feature allows providers to see and measure body temperature.




Patient Device

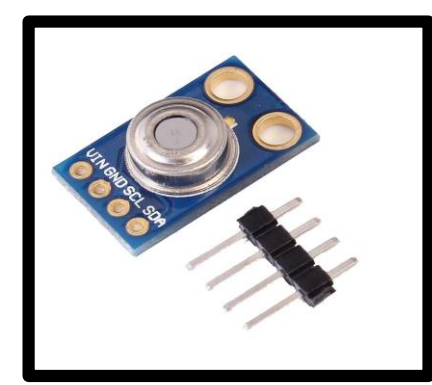


Software Application

Arduino Processor
Arduino provides a flexible source hardware configuration. Its open software and widespread availability are additional advantages for a system operating on a large scale.



Sensor MLX90614
Sensor for non-contact temperature measurements. It focuses infrared electrical energy, which converts the energy into a signal that can be displayed in units of temperature by varying the ambient temperature.



LCD Display
To display words, digits, and seven-segment displays, as in a digital clock. It is an electronic display module that uses liquid crystal to produce a visible image

Portal Information
Patient information including age and temperature store are easily accessible remotely from any Wi-Fi enabled device with a web browser.

Temperature
Users are provided with the touchless thermometer, allowing users to track the most recent temperature. Infrared thermometer

- Temp range. (C) -30 to 350 ° C
- Focus Point Size and Distance 1 "to 10"
- Accuracy +/- 1.5%

FUTURE DIRECTION

- Aim towards the forehead or at exactly 90 degrees to the surface that is to be measured.
- Adjust the temperature measure unit to be either Fahrenheit or Celsius.
- The non-contact body infrared thermometer is specially designed to take the body temperature. The human body range from 32 – 42.5 degree Celsius.
- For surface temperature measurement the temperature ranges from 0 to 60 degree Celsius.
- Data memory automatically after temperature measurements which was display on the LCD.

REFERENCES

- ¹ M. McClendon. Private Health Care. 2020.
- ² J. Gustafsson. Private Health Care. 2020.
- ³ K. Braekkan. Private Health Care. 2020.

ACKNOWLEDGEMENTS

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