Infection Control Robot IOT

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Abstract—**Nowadays controlling the spread of the infectious diseases is the atmost priority.The main aim of the infection control robot is to limit the spread of communicable diseases by taking the precautionary measures regarding the sanitisation procedures. Proper maintenance of the surrounding environment is the upmost priority in the public places. Prevention technologies are giving rise to new era of highly efficient robots. The system consists of a robot and the monitoring unit which consists of temperature ,mask detection . In this project, we propose a navigation system where we sense the temperature ,monitor the mask detection and the sanitisation technique which are integrated together for the effective working of the project .**

KEYWORDS:

I. INTRODUCTION

Technology is advancing ,the implementation of the temperature detection, mask detection and hand sanitization techniques can be done easily .There is a need for implementation of these in various places to ensure safety. Manual way of doing these steps are dangerous as the person may get in contact with others,which increases the spread of diseaese .To overcome this problem and to increase the safety ,Mask detection, temperature sensor,hand sanitization techniques are used.

Temperature sensing subsystem relies on using mlq temperature sensor,while mask detection performed by using manual monitoring using the camera , then the automatic hand sanitizing is achieved by the relay motor connected with the sensor and . Any person without temperature check, hand sani tizing and mask scan will not be provided entry. Only person having the conditions satisfied by the system is instantly allowed inside, else the buzzer will alert the secu rity about the situation, if any violation of the condition is found.The temperature sensor it measures persons temperature using contactless mlq sen sor. Mask detection using an camera We manually monitor the person through the camera if he is wearing the mask or not. Sanitization: If both the above conditions are satisfied then the monitor monitoring the situation presses the another push button, when the hand placed front of the dc motor the sanitiser will be sprayed.

II.METHEDOLOGY

Developing a system design that incorporates the necessary technolo gies, including sensors, cameras is necessary. This design will include a alert system which notify if the requirements are not met.
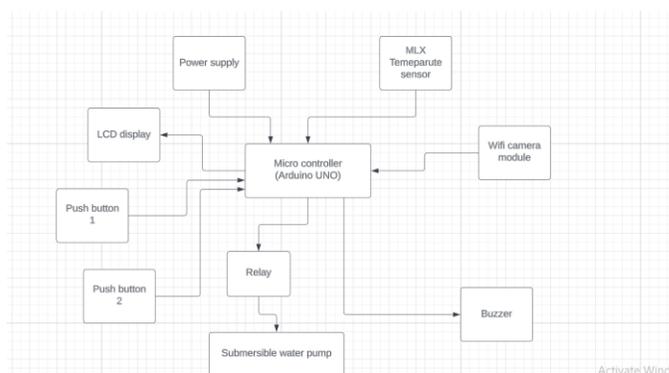

Fig1:Block diagram

The block diagram shown in is the high level design architecture of the Infection Control Robot. Building the system according to the design specifications and assem bling the hardware components. Integrating the various components of the detection system, including the sensor system, mechanical system, and notification system and ensuring that the system components com municate effectively and operate seamlessly. The system block diagram consists of Arduino which is the main unit of a system it receives its input signal from power supply, the Dv capture camera which capture a person's face and temperature sensor use IR energy to detect the temperature of person.

III.HARDWARE REQUIREMENTS

The implementation of this project is is carried using Embedded C language .

A. Arduino Uno:

It is a low budget microcontroller board, which is programmable. While associating microcontroller board with computer we use USB cables, it has 14 digit input pins and 14digit output pins.

Fig 2: Arudino Board

B. Temperature Sensor:

It is a contact less Sensor, which has fea tures of measuring temperature of an object or a body between the ranges of - 70°c to 382.2°c. It uses the IR rays to measure the temperature without touching it.
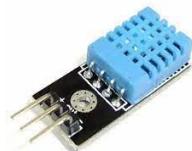
Fig 3: Temperature Sensor

C. Buzzer:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric.

Fig 4: Buzzer

D. LCD:

One of the most common devices attached to a micro con troller is an LCD display. Some of the most common LCDs con nected to the many microcontrollers are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.
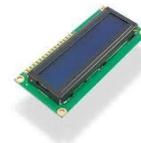
Fig 5:LCD Display

E. DC Motor:

One of the most common devices attached to a micro controller is an LCD display. Some of the most common LCDs connected to the many Arduino's are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

Fig 6: DC motor

F. Camera Module:

The Camera Module can be used to take high def inition video, as well as stills photographs.

G. Adapter(Power Supply):

The AC adapter, AC/DC adapter or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. The internal circuitry of an external power supply is very similar to the design that would be used for a built-in or internal supply.

H. Push Button:

A Push Button switch is a type of switch which con sists of a simple electric mechanism or air switch mechanism to turn something on or off.

Fig 7 :Push Button

IV. IMPLEMENTATION

A. *The temperature Detection:*

It measures persons temperature using con tactless IR sensor. The person pass one by one. If the temperature is normal it displays in the lcd . In case that persons temperature exceeds average human body, and then Arduino generates signal to lock the door and gives the audible alert through buzzer.

B. *Mask detection using an camera:*

When the person comes in front of the camera the monitor will analyse the situation. If the person is wearing the mask then sanitization process will occur. If not the monitor will press the push button and lcd will display the warning message.

C. *Alerting System:*

If the temperature is above the threshold buzzer supply is turned on by the Arduino and If person doesn't wore the mask is alerted using LCD where some messages are displayed.
All the requirements should be met to the sanitiser to be sprayed.

D. *Sanitization:*
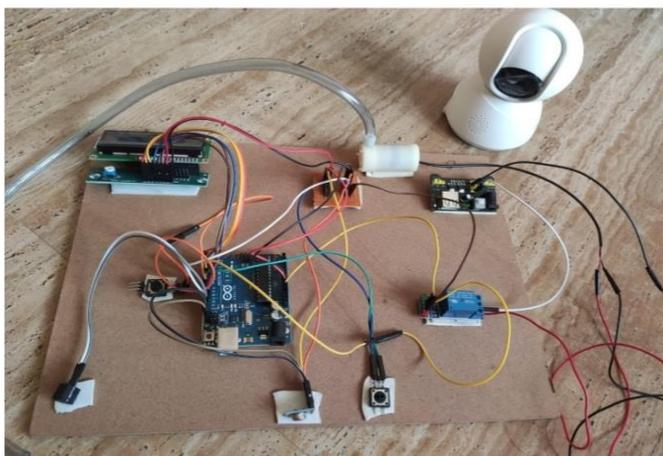
Fig 8:Working model

When the person place the hands in front of the ultrasonic sensor the monitor will press the another push button to spray the sanitizer . The dc motor is used for this purpose.
All the requirements should be met to the sanitiser to be sprayed.

V . CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Sec ondly, using highly advanced ICs with the help of growing technology, the work has been successfully implemented. Thus the work has been successfully designed and tested.

REFERENCES

[1] Davide Piaggio, Marianna Zarro, Silvio Pagliara, Martina Andellini, Abdulaziz Al muhini, Alessia Maccaro, and Leandro Pecchia. The use of smart environments and robots for infection prevention control: a systematic literature review. American Jour nal of Infection Control, 2023.

[2] Penny Dodds, Katharine Martyn, and Mary Brown. Infection prevention and control challenges of using a therapeutic robot. Nursing Older People, 30(3), 2018.

[3] Wei Qi Koh, Faith Xin Hui Ang, and Dympna Casey. Impacts of low-cost robotic pets for older adults and people with dementia: scoping review. JMIR rehabilitation and assistive technologies, 8(1):e25340, 2021.

[4] Anzhu Gao, Robin R Murphy, Weidong Chen, Giulio Dagnino, Peer Fischer, Maximil iano G Gutierrez, Dennis Kundrat, Bradley J Nelson, Naveen Shamsudhin, Hao Su, et al. Progress in robotics for combating infectious diseases. Science Robotics, 6(52):eabf1462, 2021.

[5] Diab-El Schahawi, Walter Zingg, Margreet Vos, Hilary Humphreys, Lorena Lopez Cerero, Astrid Fueszl, Jean Ralph Zahar, Elisabeth Presterl, et al. Ultraviolet disinfec tion robots to improve hospital cleaning: Real promise or just a gimmick? Antimicrobial Resistance & Infection Control, 10(1):1–3, 202