



REVA
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A Mini Project Report on

**“AUTOMATIC TEMPERATURE DETECTION
DOORBELL FOR COVID-19”**

Submitted

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Submitted By

MOHAMMED RAYYAN	R18CS232
MOHAMMAD KAIF KASIM SHAIKH	R18CS228
MOHAMMED SUFYAN	R18CS233
MADDINENI HRUDHVIMOHAN	R18CS208

Under the guidance of

Prof. Anooja Ali

Designation

School of CSE

REVA UNIVERSITY

School of Computer Science and Engineering

Bengaluru-560064

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SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

This is to certify that the mini project entitled “AUTOMATIC TEMPERATURE DETECTION DOORBELL FOR COVID-19” is a bonafide work carried out by **Mohammed Rayyan, Mohammad Kaif Kasim Shaikh, Mohammed Sufyan, Maddineni Hrudhvimohan** bearing **R18CS232, R18CS228, R18CS233, R18CS208** respectively in partial fulfilment of 6th semester of Computer Science and Engineering program of Bachelor of Technology, [REVA University during the academic year 2020-21. It is certified that all the corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the school library. The mini-project report has been approved as it satisfies the academic requirements in respect of mini-project prescribed for the 6th semester of CSE program.

Signature of the Guide

(Guide Name)

Signature of the Director

(Dr. Sunilkumar S. Manvi)

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MOHAMMED RAYYAN

MOHAMMAD KAIF KASIM SHAIKH

MOHAMMED SUFYAN

MADDINENI HRUDHVIMOHAN

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ABSTRACT

The COVID-19 pandemic has brought about a complete shakedown on our world on the basis of human life, property and economical crisis. The lockdown all over the globe has caused major panic and discomfort at every household and their doorstep. Social distancing is the one of the best method to escape from COVID-19. But we can't avoid some emergency visits to some homes. But what if we could be precautious at that very doorstep by a smart doorbell which will let you know the body temperature of the visitor without touch. This Automated temperature and buzzing system contains sensors which will measure the temperature of the person in front of an entry point. If the temperature of the person is below 37.6 degree, below the acceptance limit, will blink and automatically the door bell will buzz and the person enters without touching any surface, common walls or doors. After this process one can enter the gates of offices, mall, house, college entrance and hospitals. This device will be operated by motion of hand. The backbone of this project is based on Internet Of Things (IOT). It is equipped with temperature sensor to detect human temperature and PIR motion detection sensor for no human contact. The software used behind is Arduino IDE and Autodesk Fusion 360 to make it user friendly. The Doorbells are among the most germ-infected objects in houses, hospitals, factories, and elderly homes. This product will provide an extra layer of safety from covid-19 infection by making automatic decisions through the developed system as vaccines are still away.

CHAPTER 1: INTRODUCTION

1.1 Motivation

In the year 2020, Covid-19 virus has infected mankind on this earth and as per studies, corona viruses stay on surfaces for nearly 24-48 hours. In these situation to stay safe we have to follow various precautions. Washing our hands regularly, wearing masks in public, and avoiding touching surfaces. We can't have the same old habits of eating, travelling, buying or even doing our routine works. Today homes have become offices and the internet is only saviour. During lockdown the trend of ordering online and home delivery of various things groceries, electronics, books has increased. Though e-commerce companies claim that their employees take all safety measures from sanitizing to social distancing but when they come to house they have to touch the doorbell and their temperature needs to be scanned. Also the doctors, government officials have to go door to door for testing the local communities. So, touching surfaces is one we should avoid.

When we arrived at Infront of a house, first we search the doorbell button/ calling bell button. And press the button. But in this special situation this doorbell button can cause the virus to spread and enter our homes. When some infected person presses the button, the virus will hold on that button and when a non infected person touch this button the virus spread to that person. We can avoid this danger by using this Smart Doorbell which scan your visitors body temperature as it detects an object Infront without human touch and will ring the bell. If body temperature is normal it will ring the bell, otherwise an alarm will appear and notify the owner.

1.2 Objectives Of The Project

To avoid infection from covid 19 virus, in these difficult times, which is spreading exponentially, we should avoid touching surfaces. The Doorbells are among the most germ-infected objects in houses, hospitals, factories, and elderly homes. So for the safety of the family members, colleagues, doctors, delivery person touching at the doorbell is a problem. So we have created this Automated temperature doorbell which will measure the temperature of the person in front of an entry point and the person enters without touching any surface, common walls or doors.

CHAPTER 2: LITERATURE SURVEY

A. SMART SECURITY SURVEILLANCE USING IOT

This paper [1] aims to discuss system is proposed for development of security surveillance system using Raspberry Pi along with PIR motion sensor and camera module smart security surveillance using IOT with PIR sensor and camera module is an interesting idea to involve detection of sensing of the moving object and generate responses for better security. In this paper, the work has been done using sensor and camera, the system detects motion in front of the door and capture image which is then sent to the user's cell phone along with the image in the email inbox and a detection message.

B. SMART BELL NOTIFICATION SYSTEM USING IOT

This paper [2] aims to discuss, Smart Bell Notification System uses microcomputer, Raspberry pi, camera, PIR sensor, Buzzer. This paper signifies the steps towards the smart home and living. In today's day to day life there is inconvenience in trends if delivery is faced by customer and delivery person if the concerned one is not present at his home. It gives the idea about the same doorbell which is helpful for the friends and relatives who visit our place unannounced.

C. APPLICATION AND DESIGN OF AUTOMATION COMMUNICATION DEVICES

This paper [3] aims to discuss, Application and Design of Automation Communication Devices. Digital doorbell designed which includes the special features, they are as followed: The digital doorbell can provide some LCD text and voice prompts, which is very useful for the visitors. The digital doorbell can "remember" the information of visitor, then the owner will know when he is not at home. This doorbell plays different music when different visitors will come. Besides a doorbell, it can also be used as a ordinary clock by adding Real-time clock or calendar circuit which provides seconds, minutes, hours, day, week, month, year information. Limitations of the system is we may need to pay for monthly cloud subscriptions to enable.

CHAPTER 3: SYSTEM DESIGN AND ANALYSIS

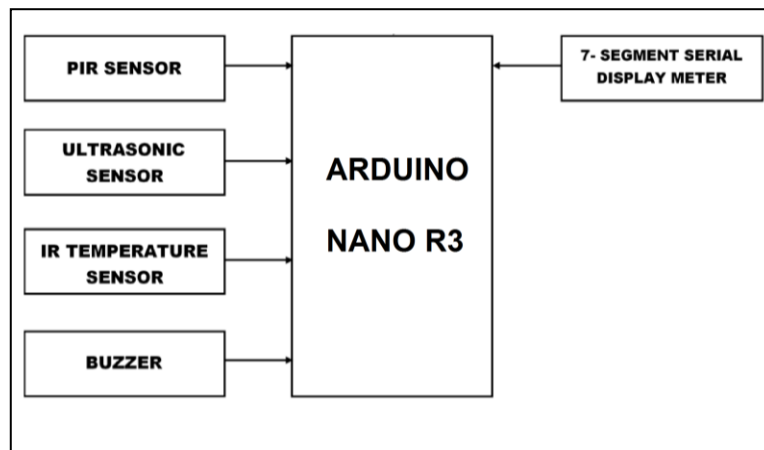


Fig 1. Architecture – Block Diagram

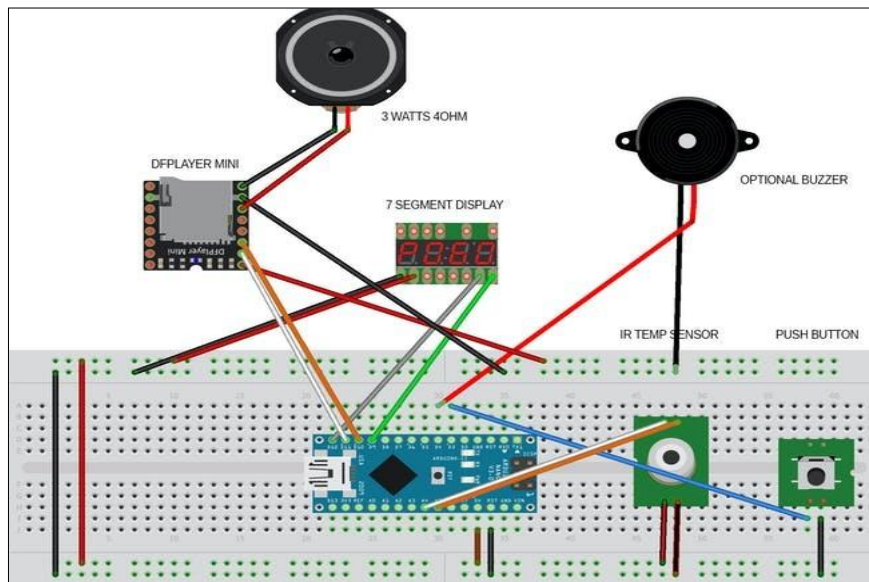


Fig 2. Circuit Diagram

Connections

- // IR Temp sensor SDA A4 SCL A5
- // 7 Seg Display Clock D12 DIO D9
- // Buzzer GND and D4
- // Button GND and D3
- // MP3 Player

In order to give this product aesthetic appeal, prototype design has been proposed below.

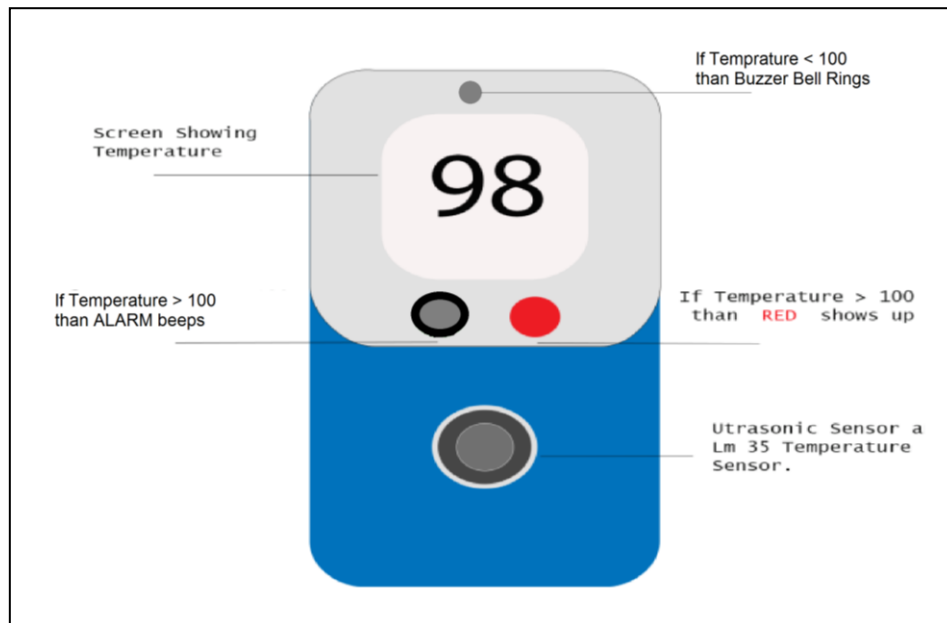


Fig 3. Product Design

CHAPTER 4: SYSTEM REQUIREMENTS

4.1 Software Requirements

1	Arduino IDE
2	AutoDesk Fusion 360

4.2 Hardware Requirements

1	Arduino Nano R3
2	Buzzer
3	IR Temperature Sensor
4	7- Segment Serial Display
5	Ultrasonic Sensor
6	Arduino Nano R3
7	MP3 Player Mini

CHAPTER 5: METHODOLOGY

The entire process starts when a visitor approaches the doorstep. When show our hand Infront of IR Sensor, The sensor will send signal to Arduino board. And Arduino drive the relay. Relay is connected with doorbell. And finally the bell will ring. At that point, a hidden IR thermometer measures body temperature, the temperature is displayed in the 7 segment display screen and compared with standard fever temperatures. If visitor body has no temperature, the doorbell will ring, otherwise an alarm will alert you about a potentially infected visitor.

IR Thermometer Theory

Everything that has mass emits energy in the form of heat. Since there is heat being emitted by any object or person, an infrared thermometer can use the difference between the IR rays coming off of the person and the surrounding environment to determine temperature of the person itself.

The IR thermometer works by focusing light that is coming from the object in the form of IR rays and funneling that light into a thermopile. In the thermopile IR radiation is turned into heat, which is then turned to electricity, which is then measured.

WORKING

A 5V Supply is given to Ultrasonic sensor and Arduino board from the Ultrasonic Sensor the signal is generated and that is converted in the distance by the coding and controller system, is attached to digital pin number 7.

IR temperature sensor is connected to Ground and 3.3V input supply for sensing the temperature from the body, it is connected with the RGB led, on the controller board and internally in the code the parameters are given regarding the temperature values high and low. Buzzer is connected to Ground and digital pin number 7 where it will follow the signal reading from the ultrasonic sensor and it will start buzzing. RGB Led is connected to digital pin number 2, 3, 5. It will ring the buzzer bell if temperature of person is below 37.6 degree Celcius and will blink red and initiate the alarm if temperature is higher than 37.6 degree Celsius. A 7- Segment Serial Display Screen to read the temperature is connected to Arduino by Ground and 5V input supply. Ultrasonic sensor operates when in range of 1 foot. The Alarm speaker wires are connected to digital pin number 15. The battery pins of the doorbell circuit to the 3.3 V and ground.

CHAPTER 6: EXPERIMENTAL RESULTS



FIG 4. This doorbell has a hidden IR temperature sensor to detect visitors with high fever



FIG 5. Checking the temperature by using a hot beverage to simulate high fever

CHAPTER 6: APPLICATIONS

1. This system can be used at every possible entry point to check the body parameters, it is majorly used in offices and crowded places where maximum number of people are visiting in a single day.
2. Even at the hospitals there are different covid wards where sudden temperature check is needed, where some time it is the most important product which is very useful .It can also be installed at the society entrance gate and thus rules of social distancing will be followed. Thus this device is easy and safe to use.
3. Guest, house workers and even delivery person can be checked for the symptoms of COVID-19 before entering the house.
4. Spread of virus can be reduced by the touchless doorbell.

CONCLUSION

The Doorbells are among the most germ-infected objects in houses, hospitals, factories, and elderly homes. We can avoid this danger by using this Doorbell which scan your visitors body temperature without any human touch and keep the virus out of your house. This research is extended by linking it to devices through Iot. This will help in reducing the manpower to check the temperature. In the future aspect it can connect to the emergency medical services. In general, this product will provide an extra layer of safety from covid-19 infection by making automatic decisions through the developed system as vaccines are still away, the process of primary detection of symptoms that is fever is very important. We stand behind our mission to build a better and healthier world, which is why we are making this project to control and avoid further passing on COVID-19. With our technology we intend to keep all our homes Safe, Secure and Smart.

FUTURE ENHANCEMENT

The future enhancement to this smart doorbell will be an addition of Raspberry Pi and USB Camera for a virtual display of the visitor and to notify the owner. With the equipped camera Speak to Visitors without Having to Open the Door. If a visitor knocks at the door instead of rings the doorbell, the video camera captures the image for you to view later. Now you can always know who has come by your house. A Ring Video Doorbell Wireless Camera at your home provides a clear inference to a burglar that discourages them to attempt.

For further future enhancement we connect this doorbell to the cloud using MQTT for notification and database of visitors at the doorstep.

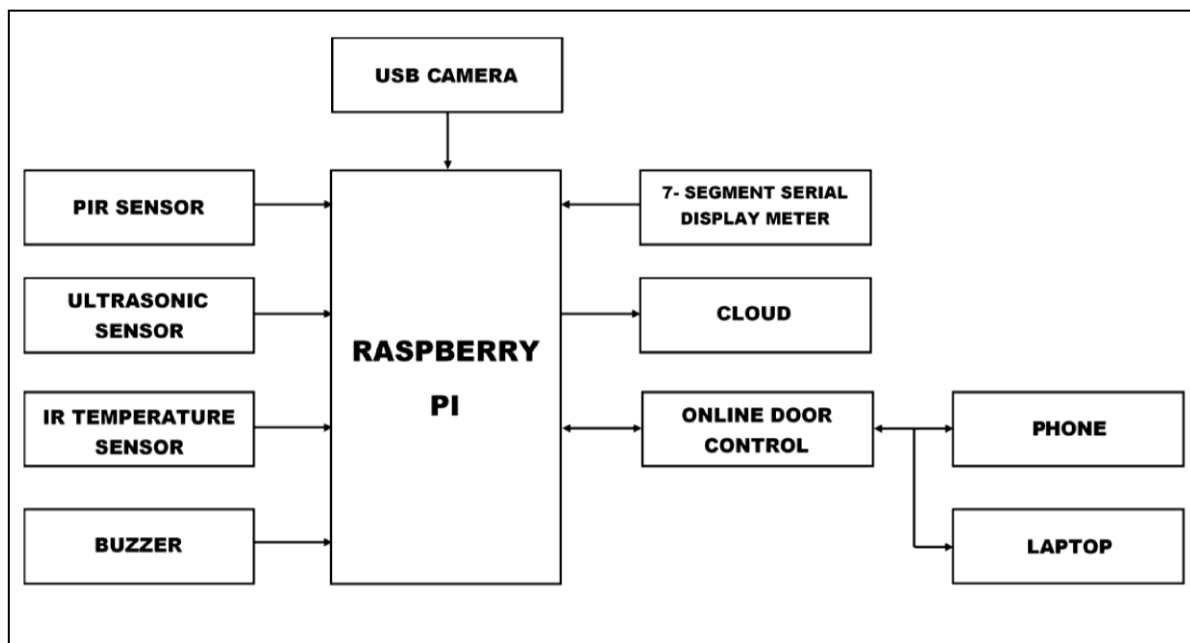


FIG 6. Block Diagram Of Future Enhancement

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