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CONTACTLESS IOT DOORBELL

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Abstract : Social distancing is one of the best methods to escape from COVID-19. We strongly recommend everyone to stay at home. But we can't avoid some emergency visits to some places. When we arrive in front of a house, the first thing we search for is the doorbell and then press the doorbell to let the person inside know about someone's presence. But in this pandemic situation, the traditional doorbell can cause the virus to spread through touch. If an infected person touches the doorbell, the virus from the infected person remains on the doorbell for a long period of time. So, if some other visitor visits & rings the doorbell, he/she would have a high risk of coming in contact with the virus through touch. We can avoid this danger by using contactless doorbells outside our houses using IoT. The traditional doorbell can be converted into a contactless doorbell. In this, we have used the Arduino board along with Ultra Sonic Sensor HC-SR04 to make the doorbell smart where Ultra Sonic Sensor can sense the presence of a person and send the signal to the Arduino Board, and then Arduino Board reserves the signal and sends it to the Servo motor where Servo motor can rotate 90 degrees to press the switch of the traditional doorbell. We set up this IoT-based product over a traditional doorbell so its cost efficient. Also it's a great help to prevent further spreading of virus.

IndexTerms **-IOT , Covid19 , Arduino Uno , Ultrasonic Sensor HC-SR04 , Servo Motor , Contactless Doorbell , Switch , Virus.**

I. INTRODUCTION

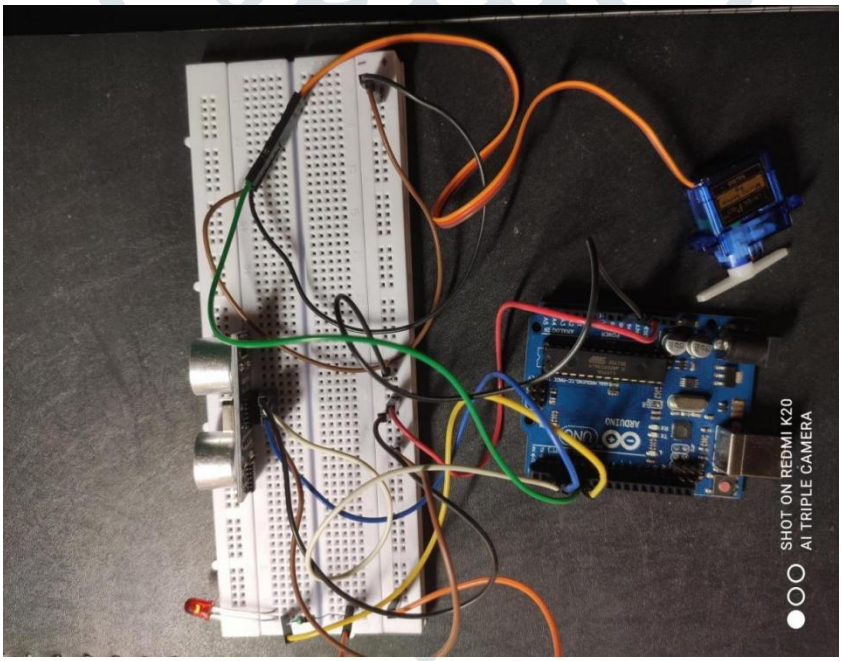
People are afraid of COVID-19 in today's world. People have even been observed coming less out of their homes during these tough times of pandemic. [1] Scientists, specialists, and technical experts are working to find a way to stop it from spreading, and many devices and gadgets have been developed in this direction to identify infected people and track them down in order to prevent the spread of covid-19. Many electronic types of equipment are proving to be helpful in this direction, for example, air conditioners are used in buildings. [6] Many smart gadgets are being developed for buildings that can detect people who are infected with covid-19 and thus reduce the spread by providing them and others with the indication. A doorbell allows visitors to announce their presence and request entry into a building, as well as allowing the occupant to verify the identity of the visitors in order to help prevent COVID-19 invasion at any time. [4] This Doorbell will detect people with ultrasonic sensor outside your home to identify their presence. This smart device will automatically ring the doorbell if person arrives at the door. [7] This will improve people's quality of life while also contributing to the advancement of smart homes.Due to its distributed framework developed with Arduino UNO, Ultrasonic sensor, C programming, Arduino IDE and laptops, the Doorbell system works on any existing and traditional switch based Doorbell.

II. OBJECTIVE

During this COVID situation, we are taking a lot of precautions to save ourselves from corona virus, but there are high chances of carelessness which might lead to consequences. [1] The idea behind this project was basically to reduce the spread of the virus, when someone wants to enter our home the first thing that comes in contact with that person is our doorbell, and it's not always possible to sanitize everything around us. So why not transform our traditional bell into a contact-less bell, which eliminates the contact and hence reduces the chances of spread and the project we created is highly customize and easily afford by everyone and the person who cannot use previously any smart gadget for doorbell automation our project major advantage is it can be easily detachable from it can can shift from doorbell to other electronic convenience .

III. Methodology

In this IOT based project we an create a Contact-less Smart doorbell system which can be use-full in current scenario where Corona Virus can caused can destruction where many of can dies due to it. [6] So today we can see in that scenario lot of people involved to overcome such problem that's why here we comes an idea about it and in current situation so we can going to some one home and the first thing we touch is either the door or doorbell. [3] In terms of door we can not do any thing for that but in terms of doorbell we can create a amazing project that can easily and touch-less way to unlocked door with the help of some sort of hardware that Arduino and raspberry pi but the raspberry pi is slightly costlier than the Arduino which is basically an economical in term of price and sensor we can use in this is ultrasonic and also we can use the infrared sensor also but the issue with infrared sensor is range which is not sufficient for our project con-tactless doorbell and also for the power supply we can directly connect to relay that can give power to 240 v and also we ca use the 9V battery in it and the major difference between in our project is we use a rotar motor instead of using buzzer that is present all over the internet and basically a buzzer is not enough sound that is given by the traditional electrical doorbell can give from it . If someone is deeper in her room that is two to three room inside can also here the sound of the doorbell which is coming from old doorbell system his is major advantage among our project. [7] Whenever a person arrives at our home, so instead of pressing the bell, the person can raise hand or either stand in front of the sensor that can automatically detect at a distance of around 10 to 60 cm so that the ultrasonic sensor can sense the presence a person and bell will ring automatically using servo motor without any touch to the bell. [6] Not only apply to the doorbell we can apply also done to the normal switch to make it smart where we cannot do if we cannot using the any buzzer it can work only with the help of servo motor.This this can be apply to our normal doorbell which switch based in term of costing which can very less as compared to the what we can see in the markets. [5] This block diagram can shows that clearly firstly human basically means person and the n ultra sonic sensor here we can use SC-SR04 and this sense the person and then Arduino come to play a role to catch a signal of ultra sonic sensor then transmit to the servo motor basically servo motor can capability to rotate 180 degree from it and the back to the 0 degree which can pressed the doorbell system and our project is customizable easily and also a feature of detachable easily from one place to any place if our doorbell can have some fault on it then only repair the doorbell system only. [2] This is the major advantage in terms of available doorbell system in today in the world.Working model is shown in the figure below.



IV. Existing Approach

We designed for the persona system which was furnished, in accordance with the application requirements, with sensor,camera, cellular, reel, buzzer, LED indications and drives. [3] The Blynk cloud server was ideal for such applications as it is the most popular IOT platform for cloud-based devices, remote monitoring, remote control, and an app for managing thousands of installed products. Blynk Software makes it easy for people and organizations to evolve from prototype connected products to market. [9] It requires very little code and can boot the system immediately.The system detects the presence of a person and alerts the user by emailing an image of the object as an attachment. [7] When an object is found within the range of the PIR sensor, the webcam captures the image via the Raspberry Pi and sends a command to click and save the image. In addition, when the presence of an object is detected, an SMS notification will be generated and sent to the appropriate user address via an application called "pushetta". [10] This application uses a PIR sensor to detect the presence of a person or object and a webcam to capture the detected presence. A webcam is used to capture an image when its presence is detected, and a sensor triggers the camera to capture the image and send it to the appropriate email address. The Raspberry Pi composes messages and emails to send to the defined user address. [6] Message alerts are generated through an application gateway called "Pushetta", where the webcam captures the image and sends it as an attachment to user

V. Hardware Specification

a) Arduino UNO

b) Ultrasonic Sensor HC SR04

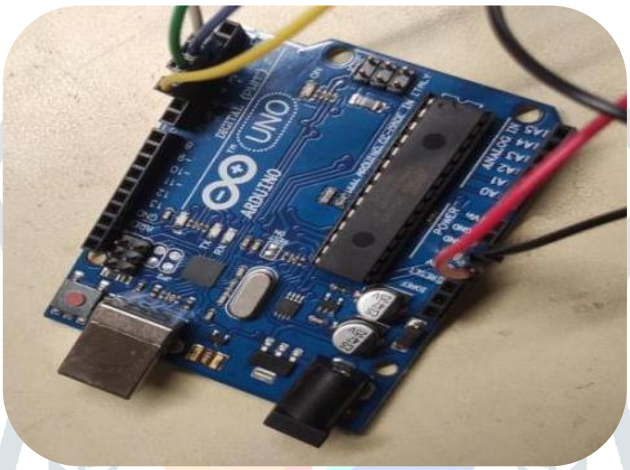
c) Jumper Wires & Breadboard

d) Servo Motor

e) 9V battery

a. Android UNO

Arduino is an open source hardware platform that is readily available to build projects. It comes with an ATMEGA micro-controller that processes the data and facilitates the proper working of the IOT system.

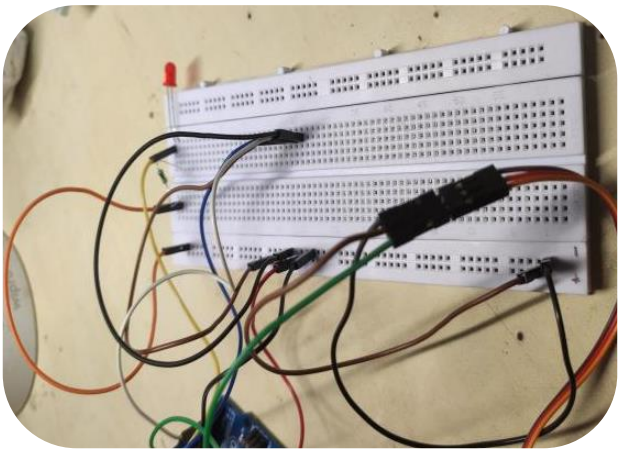


b. Ultrasonic Sensor HC SR04

The HC-SR04 Ultrasonic Distance Sensor is a sensor used for detecting the distance to an object using sonar.Operating Range is 2cm to 400c

c. Jumper Wire & Breadboard

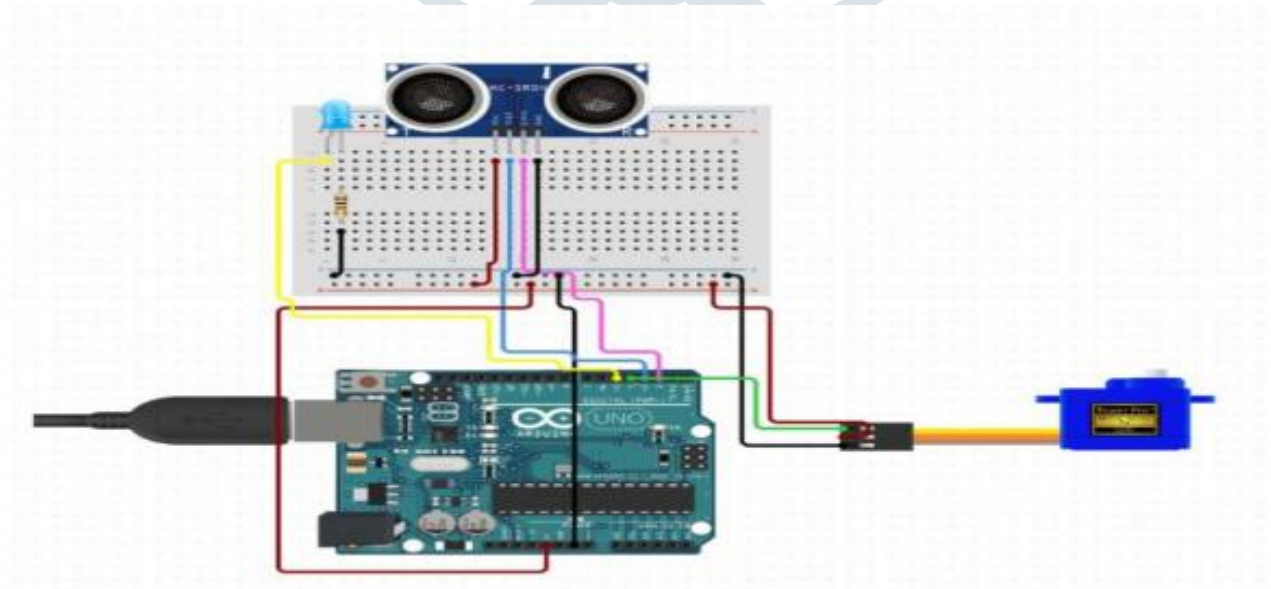
Jumper cable is a smaller and more bendable corrugated cable which is used to connect antennas and other components to network cabling.



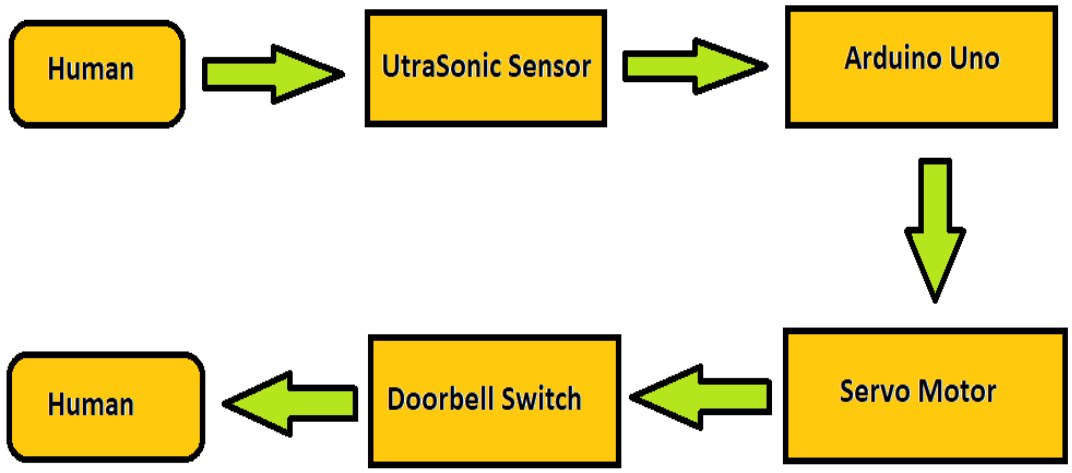
d. Servo Motor

A servomotor is a linear actuator or rotary actuator that allows for precise control of linear or angular position, acceleration, and velocity.

- **Circuit Diagram**



- **Block Diagram**



VI. Conclusion And Future Scope

The project named "Contactless IOT Doorbell" has been designed with the domain as Internet of Things. [8] The basic concepts and working of IOT has been displayed in the running of the project. The project uses mainly an Arduino Board and C programming concept. Since, today, in a technologically enhancing environment, virus spread through contact issues is of utmost concern, this project shows how technology can be used to enhance that features of people's homes. [3] A doorbell is constructed which has the feature to automatically detect a person when somebody is at the door with the help of Ultra sonic Sensor. It uses materials such as an Arduino Board, an Ultrasonic Sensor, a doorbell (any conventional electrical switch), resistors and Servo Motor. This project enables users to stay safe from the virus which can be spread through contact.

I. Acknowledgment

We are profoundly grateful to **Ms.Shefali Raina** for her expert guidance and continuous encouragement throughout to see that this project meets its target since its commencement to its completion. We hope her Knowledge and Advice's that she gave us will also be helpful in our Future Work and Endeavors as well.

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