CONTACTLESS SMART DOORBELL SYSTEM

B. Uday Reddy[1], A. Tharun Reddy[2], I. Alekhya[3], Dr. Y. Srinivasulu[4]

[1,2,3]Student, [4]Professor

[1,2,3,4]Department of Electronics and Communication Engineering

[1,2,3,4]Sreenidhi Institute of Science and Technology, Ghatkesar, Hyderabad, India

ABSTRACT - The Covid-19 outbreak has turned out to be the worst in recorded history. Millions of people have died, causing lockdowns and economic slowdowns in many countries.

The most effective method of halting the spread of the Covid-19 virus to date is probably "Social distance," as no specific antiviral treatment has yet been recommended for treating the infection. This study suggests a lot-based doorbell that notifies the homeowner when a guest arrives with a fever and potentially be a Covid-19 sufferer. The system makes use of a non-contact infrared temperature sensor and NodeMCU. All system readings are recorded in a FireBase online database, and a companion mobile app is also available. An experimental set was used to do extensive testing on the system.

Keywords : NodeMCU, COVIDE TREATMENT, MLX90614

INTRODUCTION

In the twenty-first century, it's preferable that everything be quick, contactless, and automated.

Contactless systems are now much further necessary as a result of COVID. In this case, we suggest a contactless doorbell and safety system that uses IOT to automatically identify callers and notify the homeowner. With the help of a speaker, a camera module, and a jeer pi regulator, the contactless doorbell may operate automatically. This device will let a homeowner know who's at the door and serve as a security system to advise of any thieveries when the proprietor is down from home.

A fully automated doorbell system is possible with the Raspberry Pi system. The entire operation of the system is controlled by a Raspberry Pi controller. In this case, we make use of a camera module to record and take pictures of any approaching person. The person does not need to press any buttons because the camera uses face recognition to determine whether the person is registered in the system and detects anyone approaching the door.
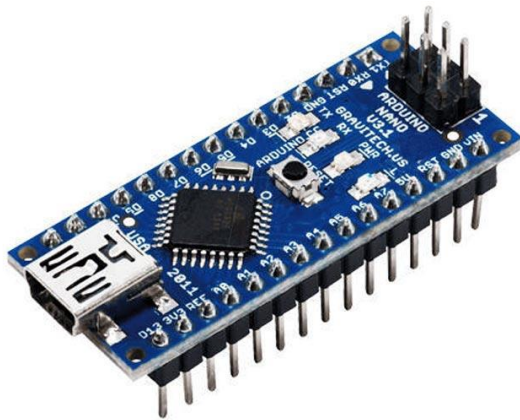
If the person is registered in the system, the doorbell will greet them and send an image and information about who has arrived to the owner over IOT. The system shows the person's image over the Internet of Things (IOT) if they are not registered, and the owner can select one of the options in the IOT interface to ask a question or post a response. The doorbell system uses text-to-speech to ask or respond to the person based on what the owner said.

Additionally, the owner can view a live image of the door front at any time by pressing a button on the IOT interface. In addition, if the owner detects a problem or an attempt to break in, the system lets them sound an alarm at the door to let neighbors know.

COMPONENTS:

ARDUINO NANO:

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.0) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It uses a Mini-B USB cable

instead of a standard one and only has a DC power jack. The Nano was designed and is being produced by Gravitech.

Specifications:

Microcontroller : Atmel ATmega168 or ATmega328

Operating Voltage (logic level) : 5 V

Input Voltage (recommended) : 7-12 V

Input Voltage (limits) : 6-20 V

Digital I/O Pins : 14 (of which 6 provide PWM output)

Analog Input Pins : 8

DC Current per I/O Pin : 40 mA

Flash Memory : 16 KB (ATmega168) or 32 KB (ATmega328) of which 2 KB used by bootloader

SRAM : 1 KB (ATmega168) or 2 KB (ATmega328)

EEPROM : 512 bytes (ATmega168) or 1 KB (ATmega328)

Clock Speed : 16 MHz

Dimensions : 0.73" x 1.70"

Module Diagram for Arduino Nano Processor

Sensors:

Ultrasonic Sensor:

Ultrasonic (US) sensor is a 4-pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This detector could be a very-about detector utilized This detector could be utilized in several applications wherever mensuration distance or sensing objects are needed. The module has 2 eyes like accompanies like robot at the front that frames the ultra- supersonic transmitter and recipient. The locator works with the simple secondary school recipe that

$$Distance = Speed \times Time$$

The Ultrasonic transmitter broadcast a supersonic wave, this wave goes in air and when it gets questioned by any
material it gets reflected back toward the sensor this reflected wave is seen by the Ultrasonic beneficiary module as appeared in the image beneath Now, to figure the separation utilizing the above recipe, we should know Speed and time. Since we tend to utilize the supersonic wave we as a whole know all inclusive speed of wave at region conditions that is 330m/s. The hardware inbuilt on the module will compute the time taken for the US wave to return and turns on the reverberation stick high for that equivalent specific measure of your time, along these lines we can likewise realize the time taken. Presently just figure the separation utilizing a microcontroller or small scale chip. Likewise, this nondeterministic mapping case (i.e., one-to-many mapping) happens even after

we normalize all parameter values to extract the structures of the web requests and queries.

Since the mapping can appear differently in different cases, it becomes difficult to identify all of the one-to-many mapping patterns for each web request. Moreover, when different operations occasionally overlap at their possible query set, it becomes even harder for us to extract the one-to-many mapping for each operation by comparing matched requests and queries across the sessions.

Module Diagram for Ultrasonic Sensor

IR Sensor:

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation rather than emitting it that is called as a passive IR sensor.Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received.

Module Diagram for IR Sensor

Buzzer:

Sensor-Buzzer is a buzzer that is passive. It is like a magnetic speaker, requires voltage with different frequencies in order to produce sound. When the frequency increases, the pitch becomes louder.


OLED:

In contrast to character LCD displays, OLED displays do not require a backlight because they produce their own light. This explains the display's ability to display deep black levels, wide viewing angle, and high contrast. The absence of a backlight significantly reduces power consumption. On average, the display draws 20 mA, though this can vary depending on how much of the screen is illuminated.

Arduino IDE:

This environment supports both C and C++

Module Screenshot for Arduino IDE
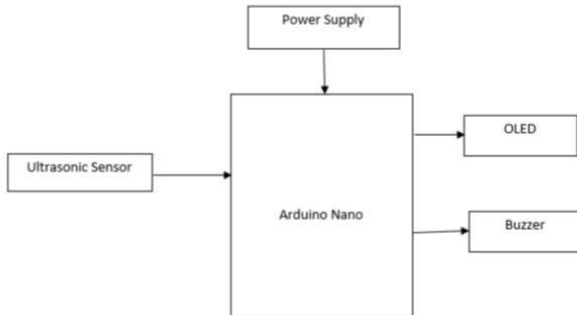
The Arduino integrated development environment (IDE) is a cross-stage application (for Windows, macOS, Linux) that is written in the programming language Java. It is utilized to compose and transfer programs to Arduino compatible boards, yet in addition, with the assistance of outsider centres, other seller advancement sheets.

The source code for the IDE is discharged under the GNU General Public License. The Arduino IDE underpins the dialects C and C++ utilizing uncommon guidelines of code organizing. The Arduino IDE supplies a product library from the Wiring venture, which gives numerous normal information and yield methodology. Clientcomposed code just requires two essential capacities, for beginning the sketch and the principle program circle, that are aggregated and connected with a program stub fundamental () into an executable cyclic official program with the GNU toolchain, additionally included with the IDE distribution. The Arduino IDE utilizes theprogram avrdude to change over the executable code into a book record in hexadecimal encoding that is stacked into the Arduino board by a loader program in the board's firmware.

The primary code, otherwise called a sketch, made on the IDE platform will eventually producea Hex File which is then moved and transferred in the controller on the board for composing the required code and later is utilized for assembling and transferring the code into the given Arduino Module.

**Block Diagram:**

Working:

The light is transmitted by the IR LED transmitter in the infrared frequency range. The visible-length wave length is shorter than the IR wave length. This IR light that is transmitted will be received by the photodiode receiver. It only moves when light hits it. Additionally, it is erroneous. Additionally, the amount of light hitting it directly correlates with the flow of the current. The voltage comparator mode of the LM358 Operational amplifier (Op-amp) is shown here. The photodiode's series resistor voltage (PSR Voltage) and the threshold voltage set by the variable resistor will be compared by the comparator. The "OUTPUT" pin is connected to the Op-amp output.

PSR Voltage drop > Threshold Voltage - Output is HIGH

PSR Voltage drop < Threshold Voltage - Output is LOW

The variable resistor is used to calibrate the distance at which object should be detected.

Connections:
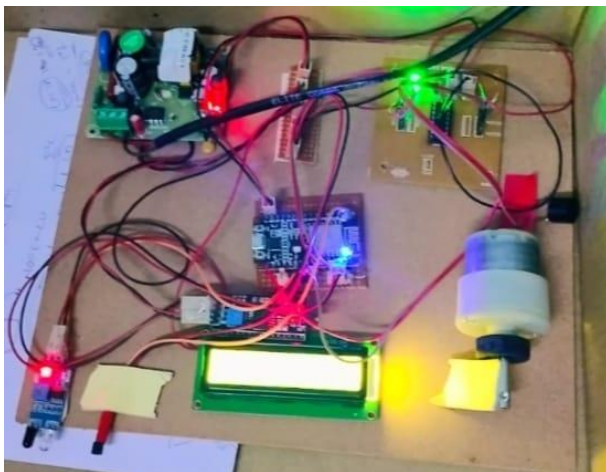
Conclusion:

One of the best ways to avoid COVID -19 is to distance yourself from other people. I strongly urge you to remain at home. However, some homes will require emergency visits from us. When we arrived in front of a house, the first thing we did was check the button for the doorbell or the calling bell. Moreover, press the button. However, in this particular circumstance, the virus may spread through this doorbell button. The virus stays on the button when an infected person presses it, and when an uninfected person touches the button, the virus spreads to that person. The contactless doorbell can help us avoid this danger. The current doorbell can be upgraded to a contactless model.

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