Mini Project Report on

AUTOMATIC DOOR OPENING SYSTEM

Submitted in partial fulfillment of the requirements of the degree of

Third year of Engineering in Information Technology.

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UNIVERSITY OF MUMBAI 2020



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CERTIFICATE

Date	<u></u> ــ :خ		

This is to certify that, the mini project work embodied in this report entitled, "Automatic Door Opening System" submitted by "Dipesh Jadhav bearing Roll No. 625", "Mohit Kamble bearing Roll No. 632", "Akshay Kalapgar bearing Roll No. 631" for the award of Third year in Bachelor of Engineering (T.E.) degree in the subject of Information Technology, is a work carried out by them under my guidance and supervision within the institute. The work described in this mini project report is carried out by the concerned students and has not been submitted for the award of any other degree of the University of Mumbai.

Further, it is certify that the students were regular during the academic year 2019-20 and have worked under the guidance of concerned faculty until the submission of this mini project work at *Rajiv Gandhi Institute of Technology, Mumbai.*

Mr. Abhay E Patil **Mini Project Guide**

Dr. Sunil B. Wankhade **Head of Department**

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CERTIFICATE OF APPROVAL

This mini project report entitled

Automatic Door Opening System

Submitted by:

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In partial fulfillment of the requirements of the degree of Third **year in Bachelor of**Engineering in Information Technology is approved.

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SEAL OF INSTITUTE	
	External Examiner
Date:	
Place:	

ABSTRACT

A simple automatic door opening system for a vehicle is designed in Arduino opening system project, where you can automate the iron gate for automatic opening closing system. This project works instantly without any human intervention.

Principle of the Project:

When a car reaches the in front of the first door, the IR Sensor gets activated. From this moment onward, a timer is initiated and will continue to keep time until the car reaches the second door. By simulating the distance between the two sensors to be 5 meters, for this we use 2 Sensors to make thing work.

Applications:

- 1) Helps in automation of door without any human involvement.
- 2) This project can also be useful as there will be no requirement of human interaction, also for huge mansion and villa the cost for hiring watching gets included.

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Introduction

Our project deals with detection of person or cars Infront of gate and thereby informing the authorities in case of violations. One of the most promising technologies is INFRARED technology. It is the technology used in the speed guns held by the police personnel to check the speed of the moving car. The other technology, rather the one we use in our proposed model are by using hardware sensors in the car itself. We do have IR sensors outside the gate which detect the car or any person. The reasons behind this project is to automate the opening closing of door out of which will save the time as well as money for many house owners. In order to make this project working we will use Arduino and 2 IR Senors. This project also solves the problem of traffic caused due to waiting of vehicle on road. Increase in speed multiplies the speed of opening the door. At high speed, the vehicle needs a greater distance to stop i.e. braking distance needs to be more. Also the other factors like driving at night, weather conditions are going to affect the manual system. Accident Statistics In addition, the police officer has to inform the nearest authority to stop the car. This is inefficient and a lot of time is wasted. With the number of work load for individual increasing day by day, time has become more precious and people can't afford wasting it for this Small Door Opening Closing Sytem. After keeping all these considerations in mind, we have designed a model Automatic Door Opening Closing System to control the Opening and Closing of door. The advantage of our proposed system is that it will detect the speed of the car also and if any car is running in speed it will inform the owner in the house.

Aims and Objectives:

- To automatically open and close the door for moving object, like a car and humans without any manual human intervention.
- Helps in capturing speed of vehicles without any human involvement.
- This project can also be used as traffic counter and few other traffic related applications.

PROPOSED SYSTEM

In order to automate the door for a moving car or object. This is a tedious process where a human has not to participate for each vehicle arriving in front of the door. What if the Car Speed Detection is made automatic at the same side? A simple automatic door opening system for a vehicle is designed in Arduino Automatic Door Opening Closing project, where you can place the system in one place and view the results instantly without any human intervention. Our proposed project aims to develop a system that detects cars arrived in front of the door and inform concerned authorities or individual immediately. Road accidents occurrences have increased recently due to cars waiting on road so there needs to be a system that allows to automatically opening of door for cars which are arrived. Currently any gates require manual door opening closing system which are usually done by particular human or watchmen in that particular premises speed and then manually inform authorities about the vehicle. Whereas this proposed system does not need any human interception and records car speed as well as wirelessly informs authorities about over speeding detections. For detection of speed of vehicle. The system first calculates the time required by the specific car for moving from first point to the second. Based on this data it calculates the car speed. This data is gathered and then transmitted by the system wirelessly to concerned authorities at a remote location. The mechanism consists of IT transmitter- receiver pair that work in combination for vehicle or human detection purpose. The microcontroller is now used to process this data and calculate the time required by vehicle to travel from one point to the other. Depending upon this time it now calculates vehicle speed as well as displays this on an LCD display. The system also sends this data wirelessly. It alerts the authority or owner about an overspeed vehicle is detected.

IMPLEMENTATION

In this project, two IR sensors are placed one inside the door and one outside the door. When any vehicle crosses the sensors, the internal timer of Arduino counts the time between activation of sensor also when car or person is detected in front of the gate. Now speed is measured by using simple distance time relationship. Both IR sensors are connected to the interrupt pin of Arduino, and they detect the falling wave. The purpose of using interrupt is that, it improves the efficiency of system. An LCD is connected to Arduino and measured speed is shown on LCD. When car moves in front of the first sensor, it gives the output signal to Arduino, Arduino detects the falling wave and opens the door, now internal timer of Arduino is started and when car moves in front of second sensor timer is stopped and the gate is closed. Now Arduino measures the speed of car which is measured by distance time relationship

We know, Speed = Distance ÷ Time

• Speed: Car's speed

• Distance: Distance between sensors

• Time measured by Arduino

IR Sensors are the main part of the project that detect the car or any object in front of the gate. Practically, you can implement the setup of IR Sensors in many ways but in this project, We have used two reflective type IR Sensors and placed them 10cm apart. When a car or any object travelling reaches the first sensor, the IR Sensor gets activated. From this moment onward, a timer is initiated and will continue to keep time until the car reaches the second IR Sensor. By simulating the distance between the two sensors to be 5 meters, you can also calculate the speed at which the car travelled from IR Sensor 1 to IR Sensor 2 as you already

know the time of travel. All the calculations and data gathering are done by Arduino and the final result is displayed on a 16X2 LCD Module.

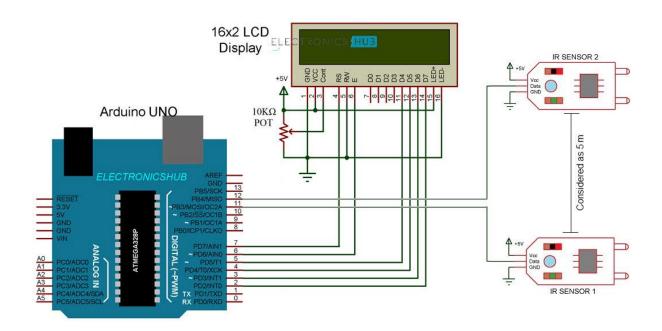


Fig. Circuit Diagram Of Car Speed Detector

CODE:-

```
int in1 = 2;
int in2 = 3;
int sensor = 8;
int led = 13;
void setup()
{
  pinMode(in1, OUTPUT);
  pinMode(in2, OUTPUT);
  pinMode(sensor, INPUT);
  pinMode(led, OUTPUT);
  digitalWrite(in1,LOW);
  digitalWrite(in2,LOW);
//digitalWrite(sensor,LOW);
```

```
digitalWrite(led,LOW);
while(millis()<13000)
digitalWrite(led,HIGH);
delay(50);
digitalWrite(led,LOW);
delay(50);
}
digitalWrite(led,LOW);
digitalWrite(in1,LOW);
digitalWrite(in2,HIGH);
}
void loop()
if(digitalRead(sensor)==HIGH)
digitalWrite(in1,HIGH);
digitalWrite(in2,LOW);
digitalWrite(led,HIGH);
delay(2000);
digitalWrite(in1,LOW);
digitalWrite(in2,LOW);
digitalWrite(in1,LOW);
digitalWrite(in2,HIGH);
digitalWrite(led,LOW);
delay(2000);
digitalWrite(in1,LOW);
digitalWrite(in2,LOW);
}
void setup()
```

```
{
    // initialize the LCD
       lcd.begin();
     // Turn on the blacklight and print a message.
       lcd.backlight();
 pinMode(sen1,INPUT);
 pinMode(sen2,INPUT);
 Serial.begin(9600);
 lcd.setCursor(0,0);
 lcd.print(" Speed Detector ");
}
void loop()
{
while(digitalRead(sen1));
while(digitalRead(sen1)==0);
t1=millis();
while(digitalRead(sen2));
t2=millis();
 velocity=t2-t1;
 velocity=velocity/1000;//convert millisecond to second
 velocity=(0.1/velocity);//v=d/t
```

```
velocity=velocity*3600;//multiply by seconds per hr
velocity=velocity/1000;//division by meters per Km
for(int i=10;i>0;i--)
{
    lcd.setCursor(3,1);
    lcd.print(velocity);
    lcd.print(" Km/hr ");
    delay(50);
    lcd.setCursor(3,1);
    lcd.print(" ");
}
```

Details of Hardware & Software

- Arduino UNO
- IR Sensors x 2
- 16X2 LCD Display Module
- Breadboard
- Connecting Wires
- Potentiometer

ARDUINO UNO:

An Arduino Uno is used as the controlling unit. The **Arduino Uno** is an <u>microcontroller</u> board based onthe <u>Microchip ATmega328P</u> microcontroller. The board is equipped with sets of digital and analog <u>input/output</u> (I/O) pins that may be interfaced to various <u>expansion boards</u> (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the <u>Arduino IDE</u> (Integrated Development Environment) via a type B <u>USB cable</u>. It can be powered by USB cable or by an external <u>9-volt battery</u>.



Fig.1 Arduino UNO

Technical specifications:

➤ Microcontroller: Microchip ATmega328P

➤ Operating Voltage: 5Volts

➤ Input Voltage: 7to20Volts

➤ Digital I/O Pins: 14(ofwhich6providePWMoutput)

➤ Analog Input Pins: 6

> DC Current per I/O Pin: 20mA

> DCCurrentfor3.3VPin: 50mA

➤ Flash Memory: 32KB of which 0.5KB used by bootloader.

SRAM: 2KBEEPROM: 1KB

➤ Clock Speed: 16 MHz

IR SENSOR:

We have used two digital IR Sensors, which consists of an IR Transmitter (IR LED), an IR Receiver (Photo Diode), a Comparator IC and a few supporting components. The IR Transmitter and Receiver Pair are placed side-by-side so that they form a Reflective Type IR Sensor.



Fig.2 IR Sensor

Features:

- Easy to assemble and use
- Onboard detection indication
- Effective distance range of 2cm to 80cm
- A preset knob to fine-tune distance range
- There is an obstacle, the green indicator light on the circuit board.

LCD DISPLAY:

An LCD is an electronic display module which uses liquid crystal to produce a visible image. The 16×2 LCD display is a very basic module commonly used in circuits. The 16×2 translates to a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix.



Fig.3 LCD Display

BREADBOARD:

A **breadboard** is used as a solderless device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.

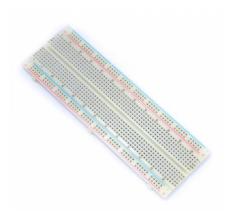


Fig.4 Breadboard

CONNECTING WIRES:

Electronics wire for connecting is often categorised by the insulation. The type of insulation is important because it often governs the type of use for which it is suitable.



Fig.5 Connecting Wires

ARDUINO IDE:



Fig.6 Arduino IDE

The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in the programming language Java. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development board.

CONCLUSION

In this project, we detect the automatic door opening closing system using two IR sensors and the components used is Arduino. We place the two IR sensors from 10cm apart. When the object is passed from the 1st IR sensors the gate opens speed is shown on the LCD Display Module. When the object is passed from the second IR Sensor the timer gets stopped. Then we subtract the timer 2 by timer 1 for calculating the speed of car and the speed is shown. Speed formula is distance upon time. So that's how we detect the speed. In this we can stop the accident which is happening nowadays. This project is very useful because the accident can be avoided as well as time and money can also be saved instead of hiring any person for opening and closing the Gate or door.

REFRENCES

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