R.T.E. SOCIETY'S
RURAL ENGINEERING COLLEGE,
HULKOTI – 582205 Dist: Gadag (Karnataka)
2023-24.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MINI PROJECT

Seminar coordinator:
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CONTENTS

INTRODUCTION

- Aims to decrease or interrupt transmission diseases and COVID-19 in a population by minimizing contact between potentially infected individuals and healthy individuals, or between population groups with high rates of transmission and population groups with no or low levels of transmission.

OVERVIEW

- Our PM Narendra Modi has spoken about keeping social distance to fight against Transmission Disease and COVID 19.
- So I thought why not make such a gadget to track social distancing even more.
- We will make a social distancing alarm using Arduino. You can also call it a social distancing alarm.
- Then you need to maintain the 1 meter distance at the stores and etc. this is social distance detecting tag.

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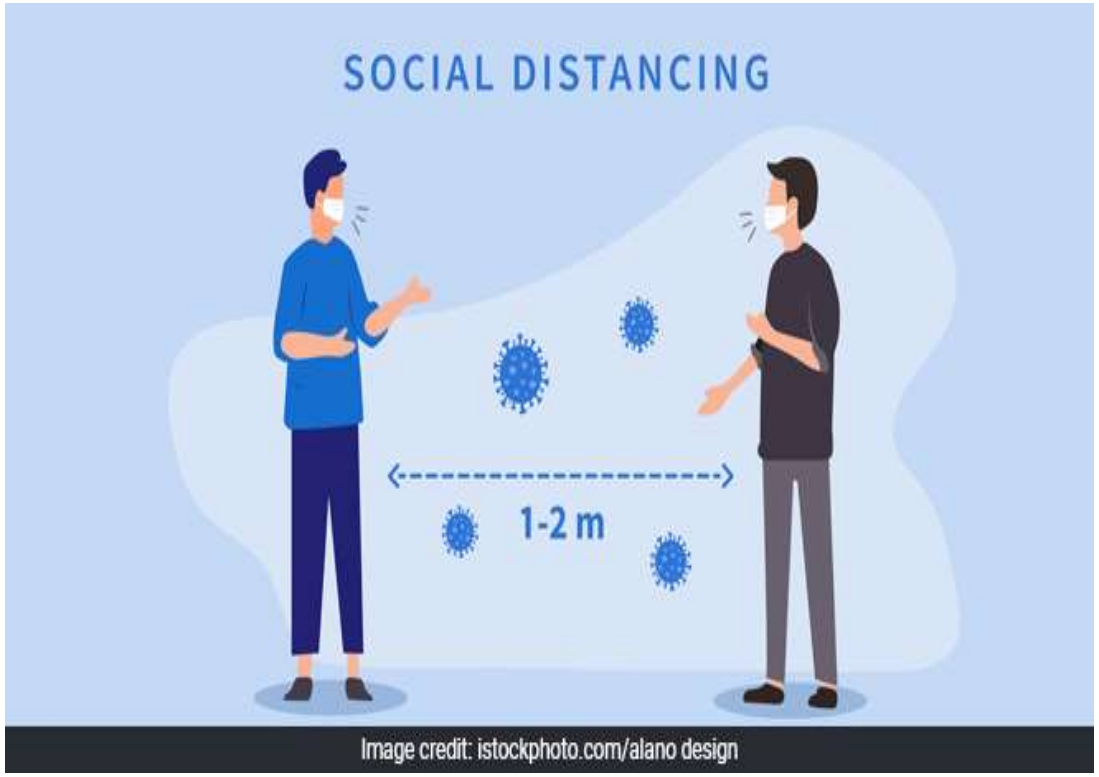
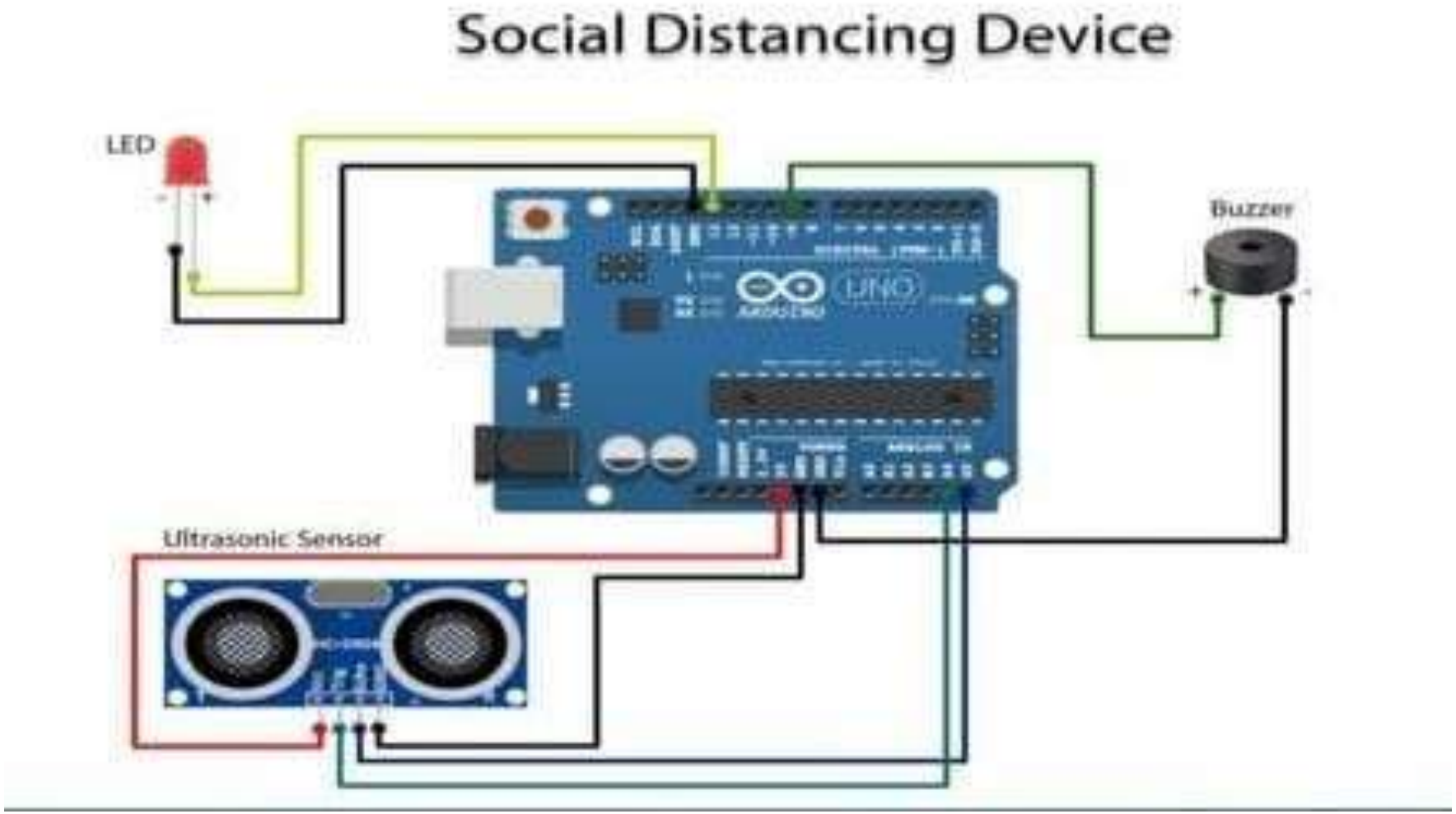


- Social distancing is the primary strategy used to prevent the spread of the virus that causes Transmission Disease and COVID-19.
- As the name suggests, it calls for people to increase the space between one another and to avoid gatherings and crowds.
- This device gives an alarm when two persons are too close. So I hope this project will be very helpful to the society.
- This tag detect 1 meter distance from the person in front of you

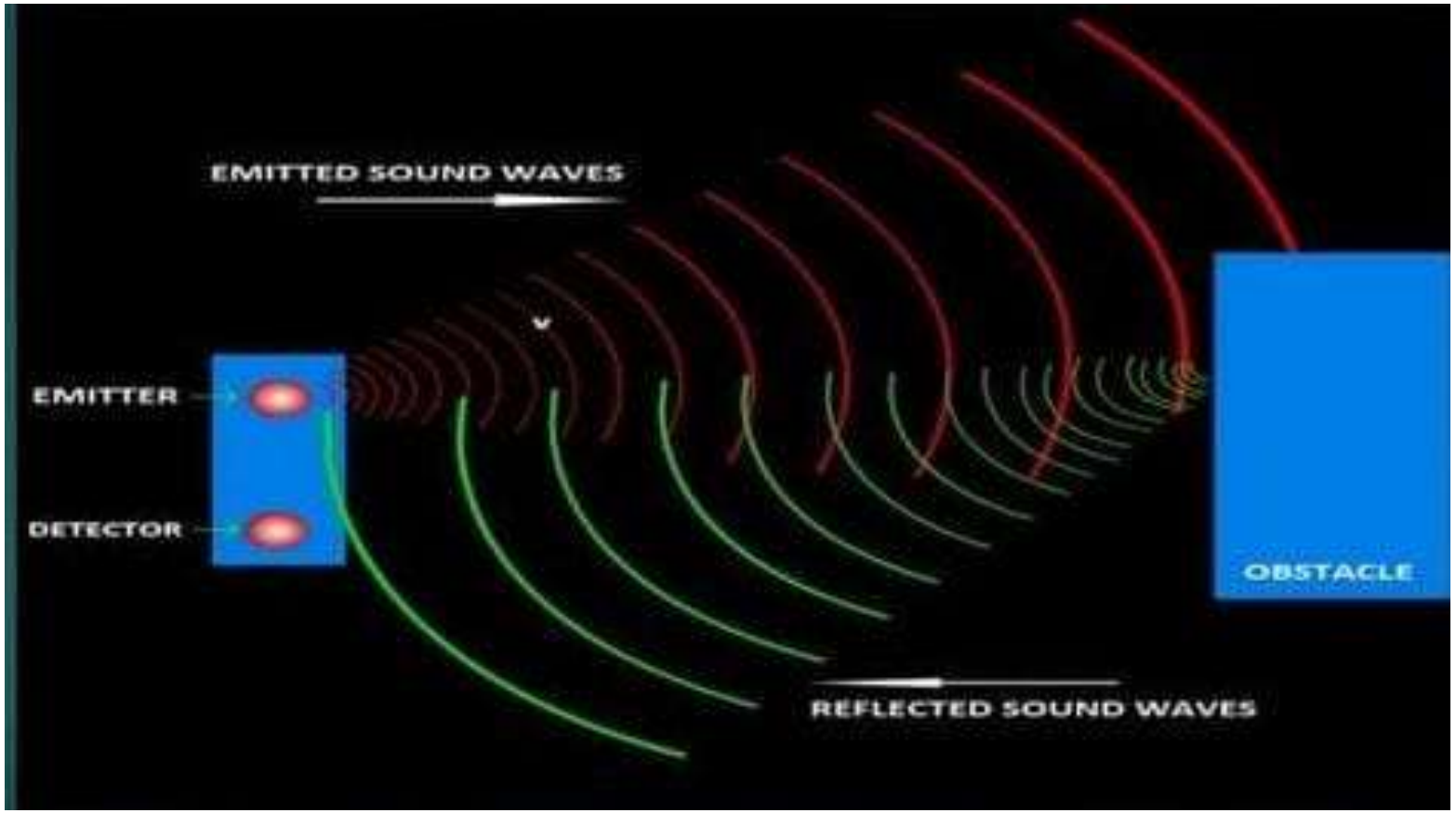
CIRCUIT DIAGRAM



For Social Distancing Detecting Using Arduino we need apparatus like:

- ULTRASONIC SENSOR
- BATTERY
- PEIZO BUZZER
- JUMPER WIRES
- MICROCONTROLLER(ARDUINO UNO)
- LED

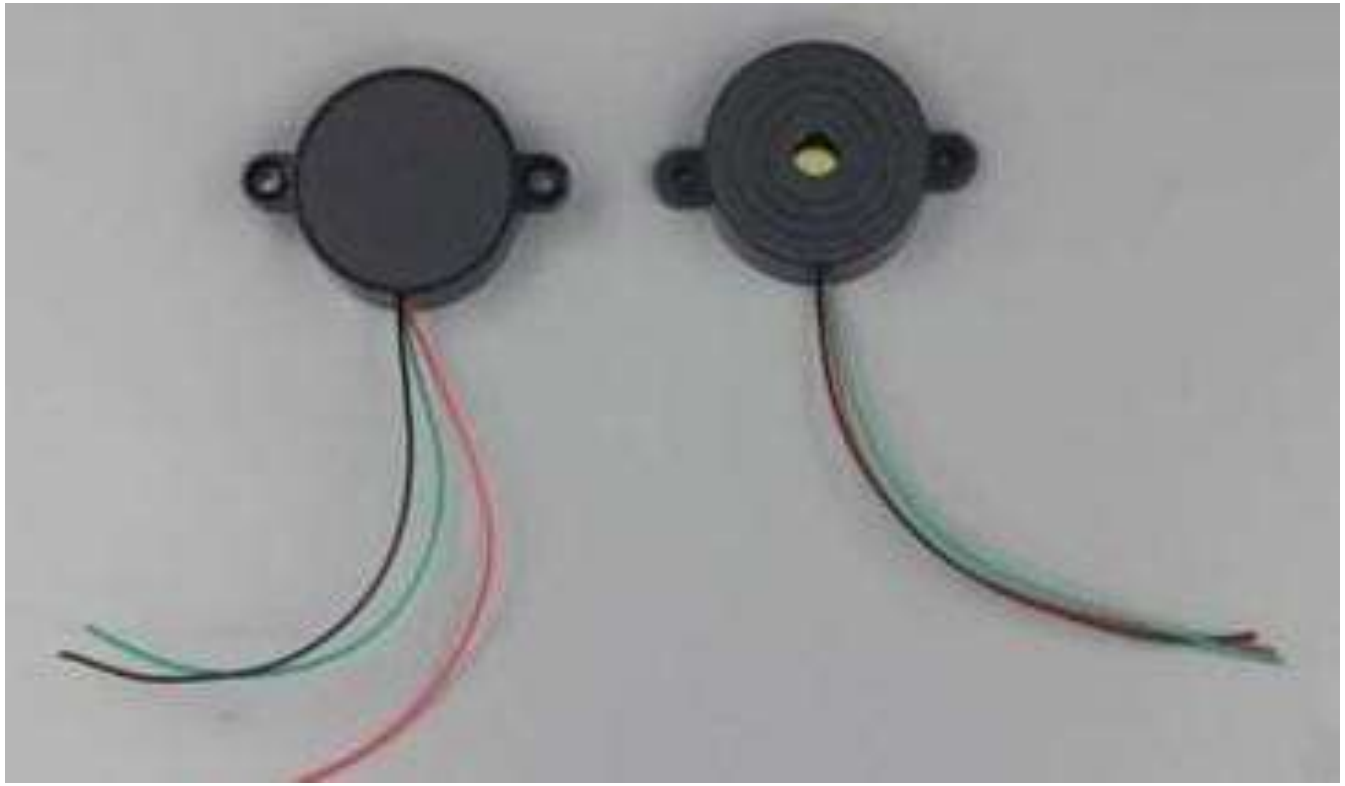
ULTRASONIC SENSOR



//.....

- This device measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound.
- Ultrasonic sensors have two main components:
- 1) Transmitter: which emits the sound using piezoelectric crystals.
- 2) Receiver: which encounters the sound after it has travelled to and from the target.
- The sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula for this calculation is
  - **D = 12 Tx C**
    - (where D is the distance, T is the time, and C is the speed of sound 343 meters/second).

PIEZO BUZZER



- The buzzer is a sounding device that can convert audio signals into sound signals.
- It is usually powered by DC voltage.
- The piezoelectric buzzer uses the piezoelectric effect of the piezoelectric ceramics and uses the pulse current to drive the vibration of the metal plate to generate sound.
- Some of the piezoelectric buzzers are also equipped with light-emitting diodes.

JUMPER WIRES

MICROCONTROLLER(ARDUINO UNO)

- The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.
- The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.
- Arduino Software (IDE) includes a serial monitor which allows simple textual data to be sent to and from the board.
- This board can be directly connected to the computer through USB cable that is used to transfer the code to the controller using IDE (Integrated Development Environment) software, mainly developed to program Arduino. IDE is equally compatible with Windows, MAC or Linux Systems, however, Windows is preferable to use.

LED

- A light-emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it.
- Light is produced when the particles that carry the current (known as electrons and holes) combine together within the semiconductor material.

WORK PLAN

- The project we made is a social distancing device by seeing daily movement of a man.
- Whenever a person goes too close to another person it automatically gives alarm and we maintain distancing.
- Keeping all in mind we planned to work on this project to save lives and minimizing the spread of corona virus.

SOFTWARE REQUIRED

- ARDUINO IDE

ARDUINO IDE


Open
Save
Menu Bar
Verify
Upload
New
Serial Monitor
Text Editor
Output Pane
The Arduino Type and Port I'm using right now
Introduction to Arduino IDE

- The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++.
- It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.
- The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures.

APPLICATIONS

- Stop shaking hands with others.
- Avoid non-essential meetings.
- Hold essential meetings in the open air.
- Provide alcohol-based sanitizer for all staff.
- Regularly clean and disinfect surfaces used by humans.
- Limit food handling and promote strict hygiene in food handling.
- Avoid non-essential travel.

FUTURE PLAN

- As we know the project is made of automated system so this type of project may help the world in minimizing the spread of corona virus.*
- If I came to Pandemic again in future, these kinds of devices could save us and prevent us from spreading.

CONCLUSION

- We tried our best to incorporate preplanned idea into our project to fulfill the required of a social distancing device.
- We also observed that our model has been able to dispense its task effectively and properly.
- This project help people in maintaining social distancing in this pandemic world of CORONA VIRUS.
- Thus we hope our project will draw attention of many people.

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Thank You!

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RURAL ENGINEERING COLLEGE HULKOTI – 582 205
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Mini Project Report on

"SOCIAL DISTANCING IN ID CARD SYSTEM"

Under the guidance of

Prof.Aleema Sultana

Submitted by

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2023-2024

CERTIFICATE

Aishwarya Ayatti(2RH21EC003), Pratima Nagannavar (2RH21EC016), bonafide student of Rural Engineering College in partial fulfillment for the award of Bachelor of Engineering in Electronics and Communication Engineering of the Visvesvaraya TechnologicalUniversity, Belgaum during the year 2023-2024. It is certified that all corrections/suggestions indicated for Internal Assessment have beenincorporated in the Report deposited in the departmental library. The EmbeddedIoT Applications Project Report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said Degree.

Guide	Co-Ordinator	HOD	Principal
Mr. Aleema S	**Mrs. Chetana H**	**Dr Suganda P**	**Dr V. M. Patil**

ACKNOWLEDGEMENT

The sense of contentment and elation that successful completion of my task would be incomplete without mentioning the names of the people who helped in accomplishment of this project, whose constant guidance, support and encouragement resulted in its realization.

It takes this opportunity of thank Dr. V M Patil, principal, Rural Engineering College, Hulkoti, for providing me with healthy environment within college, which helped me in concentrating on my task.

I am thankful to Dr. Suganda. P, Head of the Department Electronics and Communication Engineering Rural Engineering College, Hulkoti for her encouragement and help throughout the BE course.

We would like to take this opportunity to express our extreme gratitude towards our project guide Prof. Aleema S Department of **Electronics & Communication** for his invaluable guidance, advice and support throughout the project. His motivation and help have been a source of great inspiration to us.

With deep sense of gratitude, I acknowledge the help and encouragement of my Mini Project coordinator Mrs. Chetana H. for her valuable guidance and suggestion,during the course of this project. The successful completion of this project, owes to his coordination and streamlining of the project progress.

Last but not least we are also thankful to all **facility & Staff members** of our Department for corporation extended in completion of our project.

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ABSTRACT

Social distancing has emerged as a critical public health measure during pandemics such as COVID-19. Integrating social distancing protocols into ID card systems presents an innovative approach to enhancing compliance and safety. This abstract explores the potential of using ID card systems to monitor and enforce social distancing in various environments, including workplaces, educational institutions, and public spaces. By embedding proximity sensors and utilizing real-time data analytics, these systems can alert individuals when they are too close to one another, track compliance, and identify high-risk areas. Additionally, the integration of such technology can assist in contact tracing efforts, reducing the spread of infectious diseases. The effectiveness of this approach relies on robust data privacy measures, user acceptance, and the adaptability of existing infrastructure. This study highlights the technological, ethical, and practical considerations involved in leveraging ID card systems for promoting social distancing, aiming to provide a framework for future research and implementation. In response to the ongoing global pandemic implementing global distancing measures has become paramount. This project purposes the integrating of social distancing guidelines into an existing ID card system to encourage compliance and facilitates enforcement technologies such as RFID or NFC, individuals' proximity can be monitored in real-time alerting both users and authorities when safe distances are breached This project aims to develop a prototype system. Its feasibility in promoting social distancing in various environment such as work- places, schools and public spaces Through this integration we anticipate reducing the risk of transmission and contributing to the overall mitigation efforts

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CHAPTER 1

INTRODUCTION

Considering the current pandemic situation, ensuring the health and safety of employees and casual workers when they return to work is of the utmost importance. It is very critical for the company that operations produce the desired results. The obstacles to achieving company objectives are related to the safety of the workforce in the workshop, health and hygiene monitoring, social distancing, and quick decisions on outliers. All this can be addressed through the proposed intelligent solution based on multipurpose ID cards that deal with real-time monitoring of labor and related compliance checks in order to guarantee the value of your company's deliveries amid the potentially new coronavirus.[1] lethal, COVID-19 situation. Our state-of-the-art Smart ID cards are designed to help companies monitor real-time situations on the floor and ensure the productivity and safety of the workforce in the workplace. The following are the main challenges in society and offices industries.

1.1 IOT

Internet of things (**IoT**) describes physical objects (or groups of such objects) with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks.

The Internet of things (IoT) falls under the Electronics & Communication and Computer Science Engineering. Internet of things has been considered a misnomer because devices do not need to be connected to the public internet, they the only need to be connected to a network, and be individually addressable.

The field has evolved due to the convergence of multiple technologies, including ubiquitous computing, commodity sensors, increasingly powerful embedded systems, as well as machine learning. Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), independently and collectively enable the Internet of things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", including devices and appliances (such as lighting fixtures, thermostats, home security systems, cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. IoT is also used in healthcare systems.

There are a number of concerns about the risks in the growth of IoT technologies and products, especially in the areas of privacy and security, and consequently, industry and governmental moves to address these concerns have begun, including the development of

international and local standards, guidelines, and regulatory frameworks.

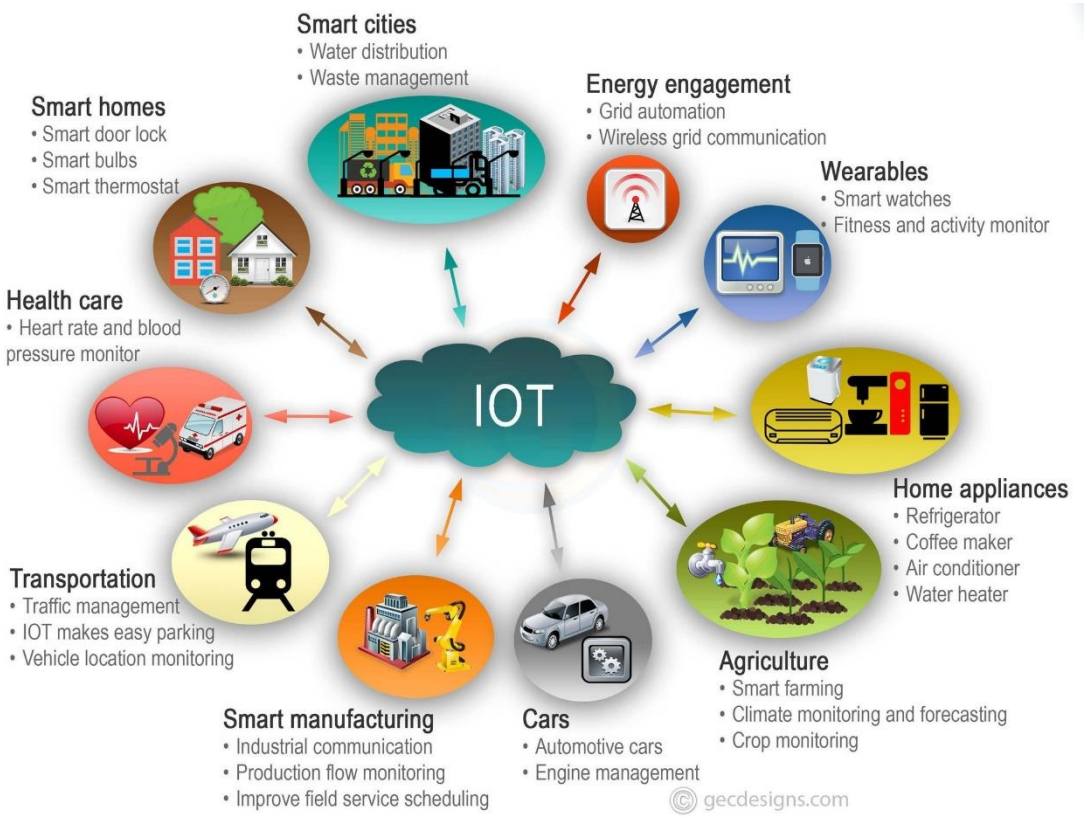


Fig. 1.1 A Modern Example of IOT

1.1.1 HISTORY:

Such as Electronic Route Guidance System (ERGS) and CACS in the United States and Japan respectively. While the term Inter-Vehicle Communications (IVC) began to circulate in the early 1980s. Various media were used before the standardization activities began, such as lasers, infrared, and the beginnings of vehicular communications go back to the 1970s. Work began on projects radio waves.

The PATH project in the United States between 1986 and 1997 was an important breakthrough in vehicular communications projects. Projects related to vehicular communications in Europe were launched with the PROMETHEUS project between 1986 and 1995.Numerous subsequent projects have been implemented all over the world such as the Advanced Safety Vehicle (ASV) program, CHAUFFEUR I and II, FleetNet, CarTALK 2000, etc.

In the early 2000s, the term Vehicular Ad Hoc Network (VANET) was introduced as an application of the principles of Mobile Ad-Hoc Networks (MANETs) to the vehicular field. The terms VANET and IVC do not differ and are used interchangeably to refer to communications between vehicles with or without reliance on roadside infrastructure, although some have argued that IVC refers to direct V2V connections Only. Many projects have appeared in EU, Japan, USA and other parts of the world for example,

ETC, SAFESPOT, PREVENT, COME

Safety, NOW, IVI.

Several terms have been used to refer to vehicular communications. These acronyms differ from each other either in historical context, technology used, standard, or country (vehicle telematics, DSRC, WAVE, VANET, IoV, 802.11p, ITS-G5, V2X). Currently, cellular based on 3GPP-Release 16and Wi-Fi based on IEEE 802.11p have proven to be potential communication technologies enabling connected vehicles. However, this does not negate those other technologies for example, VLC, ZigBee, WiMAX, microwave, mm Wave are still a vehicular communication research area.

Many organizations and governmental agencies are concerned with issuing standards and regulation for vehicular communication (ASTM, IEEE, ETSI, SAE, 3GPP, ARIB, TTC, TTA, CCSA, ITU, 5GAA, ITS America, ERTICO, ITS Asia-Pacific). 3GPP is working on standards and specifications for cellular-based V2X communications, while IEEE is working through the study group Next Generation V2X (NGV) on the issuance of the standard 802.11bd.

1.1.2 APPLICATIONS OF IOT:

The number of connected devices now dwarfs the number of humans on earth.

Researchers at Frost & Sullivan put the number of active IoT-connected devices at 41.76 billion in 2023. IoT Analytics researchers estimate the number at 16.7 billion active endpoints in 2023, while Statista estimates 15.14 billion

Despite variations in the actual figures and what's included in the count, one thing is clear: There's a mind-blowing number of IoT devices in the world. That might not be surprising, though, considering the multiple areas where IoT is being used. Those IoT connections span the globe and permeate nearly all places: homes, offices, factories, farms, vehicles and even space. Here's a detailed look at the top 12 use cases of IoT.

1. Self-driving and connected vehicles

Autonomous vehicles are one of the most notable examples of IoT in action, with longtime automotive companies such as BMW Group, Ford Motor Company and General Motors along with newer entries such as Tesla, all working on self-driving vehicles.

Self-driving cars and trucks use a slew of connected devices to safely navigate roadways in all sorts of traffic and weather conditions. The technologies in use include AI-enabled

2. Logistics and fleet management

Companies are using sensors, telematics, GPS and analytics to see where their vehicles are at any given moment, estimate when they'll arrive at their destination and whether external

conditions warrant updating routes or expected arrival times. This technology ecosystem also enables companies to identify ways to improve operations

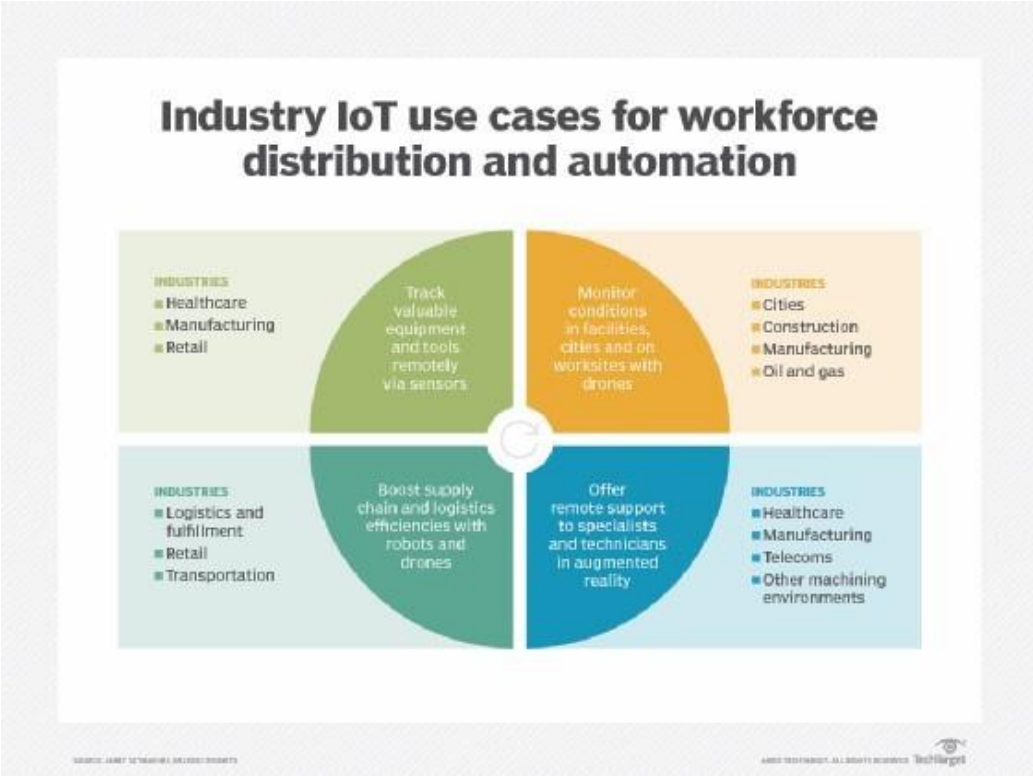


Fig. 1.1.2 Industry IoT use Cases Workforce Distribution and Automation

3. Traffic management

Part of what enables self-driving cars is smart traffic management, which is also powered by IoT.

Like the vehicles themselves, roadway infrastructure has become more connected during the past decade, with cameras, sensors, traffic light controls, parking meters and even smartphone traffic apps transmitting data that's used to help avert traffic jams, prevent accidents and ensure smooth travel.

Sensors on traffic signals can detect varying levels of light in the sky and adjust the brightness of the signals, helping ensure they're always visible to drivers.

Connected devices can be used to detect open parking spaces and transmit that information to kiosks or apps to alert drivers.

4. Smart grids, including smart meters

Utilities are also using IoT to bring efficiency and resiliency to their energy grids.

Historically, energy flowed one way along the grid: from the generation site to the customer. However, connected devices now enable two-way communication along the entire energy supply chain: from generation through distribution to use, thereby improving the utilities'

ability to move and manage it.

Utilities can analyze real-time data transmitted by connected devices to detect blackouts and redirect distribution and respond to changes in energy demand and load.

5. Environmental monitoring

Connected devices can collect data that indicates the health and quality of air, water and soil, as well as fisheries, forests and other natural habitats. They can also collect weather and other environmental data.

As such, IoT delivers the ability to not only access more real-time data about the environment at any given time and place, but it also enables a range of organizations in various industries to use that data to glean actionable insights.

6. Connected buildings and building security

Property owners are using the power of IoT to make buildings smarter, meaning they're more energy-efficient, comfortable, convenient, healthier and possibly safer.

An IoT ecosystem in a commercial building could include monitoring of the HVAC infrastructure that uses real-time data and automation technologies to constantly measure and adjust the temperature for optimum energy efficiency and comfort. Meanwhile, cameras using AI could aid in crowd management to ensure smooth flow of foot traffic or support public safety at large-scale events such as sold-out concerts.

7. Smart cities

Smart cities are consolidating IoT deployments across many facets to give them a holistic view of what's happening in their jurisdictions.

As such, smart cities incorporate connected traffic management systems and their own smart buildings. They might incorporate private smart buildings, too. Smart cities might also tie into smart grids and use environmental monitoring to create an even larger IoT ecosystem that provides real-time views of the various elements that affect life in their municipalities.

8. Supply chain management

Supply chain management has been undergoing modernization, thanks to low-power sensors, GPS and other tracking technologies that pinpoint assets as they move along a supply chain. Such information lets managers both more effectively plan and more confidently reassure stakeholders about the location of items shipped or received.

That visibility is beneficial, but it's only the start of the value proposition that IoT brings to this discipline. IoT technologies can also monitor and manage delivery requirements, for example, measuring and maintaining a specified temperature throughout transport to ensure quality and safety controls. Additionally, back-end analytics capabilities can use IoT-

generated data to determine supply chain improvements, such as more efficient routes or shipping times.

CHAPTER 2

LITERATURE SURVEY

There are many technological improvements underway in the field of electronics. twenty-first-century innovation is bringing automation - and the ability to improve security - to campus. the term "smart access cards" in educational, business, and government applications encompasses a wide range of technologies. the common feature of most proximity-based contactless solutions is based on the built-in high-frequency RFID technology. most contact id cards use magnetic stripe technology, which means students have to swipe their cards through a reader, slowing student access and creating bottlenecks. magnetic stripe cards are also unreliable as they are easily demagnetized.[4] students can load their own meal credit cards, allowing them to use their identity documents as debit cards at vending machines and canteens. id cards may include a prepaid expense account that students can use to make purchases at student stores and foodservice locations, as well as at school events. parents and students can access online accounts to view transactions, add funds and establish automatic allowances. multifunctional smart cards offer campuses several simple and cost-effective ways to increase the level of protection and the quality of education. today's smart access card technologies provide superior read range and performance so that educational institutions can improve efficiency and security at multiple levels.[5]

CHAPTER 3

METHODOLGY

3.1 BLOCK DIAGRAM

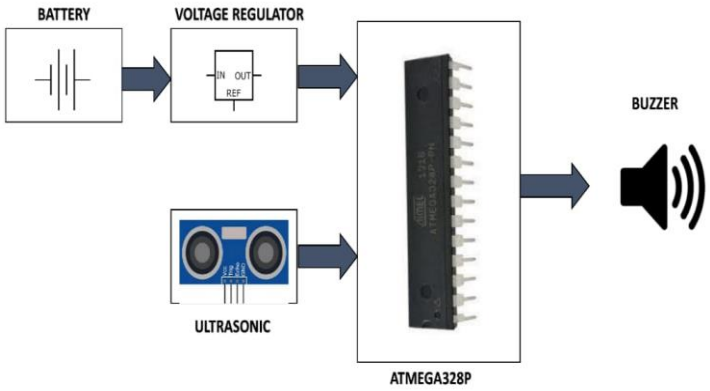


Fig. 3.1 Block Diagram

3.2 CIRCUIT DIAGRAM

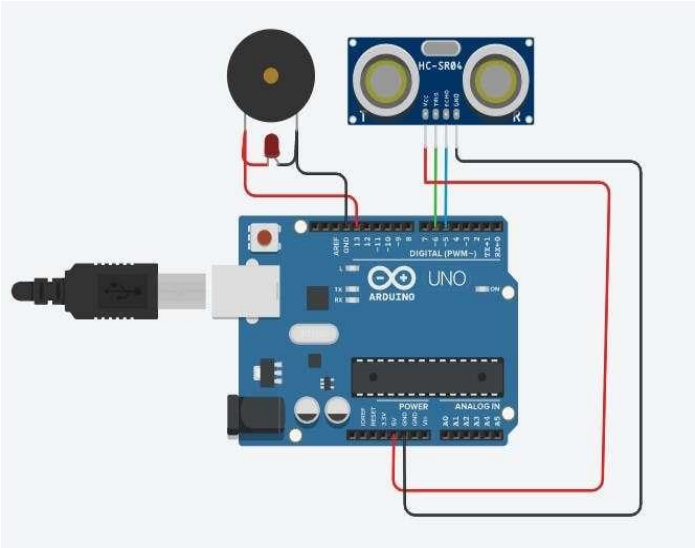


Fig. 3.2 Circuit Diagram

3.3 ARDUINO UNO

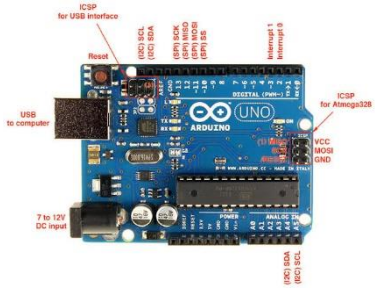


Fig. 3.3 Arduino Uno

The Arduino Uno is an open-source microcontroller board based on the Microchip AT mega 328P microcontroller (MCU) and developed by Arduino.cc and initially released in 2010. The microcontroller board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by a USB cable or a barrel connector that accepts voltages between 7 and 20 volts, such as a rectangular 9-volt battery. It has the same microcontroller as the Arduino Nano board, and the same headers as the Leonardo board. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

The word "uno" means "one" in Italian and was chosen to mark a major redesign of the Arduino hardware and software. The Uno board was the successor of the Duemilanove release and was the 9th version in a series of USB-based Arduino boards. Version 1.0 of the Arduino IDE for the Arduino Uno board has now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer.

3.4 LED'S

A light-emitting diode (**LED**) is a semiconductor light source. LEDs are used as indicator lamps in many devices and are increasingly used for other lighting.

The LED consists of a chip of semiconducting material doped with impurities tocreate a *p-n junction*. As in other diodes, current flows easily from the p-side, or anode, to then-side, or cathode, but not in the reverse direction. Charge-carriers—electrons and holes— flow into the junction from electrodes with different voltages. when a electron meet a hole, it falls into lower level, and releases the energy in

The wavelength of the light emitted, and thus its color depends on the band gap energyof the materials forming the *p-n junction*. In silicon or germanium diodes, the electrons and holes recombine by a non-radiative transition, which produces no optical emission, because these are indirect band gap materials. The materials used for the LED have a direct bandgap with energies corresponding to near-infrared, visible, or near-ultraviolet light.

LED development began with infrared and red devices made with gallium arsenide. Advances in materials science have enabled making devices with ever-shorter wavelengths, emitting light in a variety of colors.

LEDs are usually built on an n-type substrate, with an electrode attached to the p-type layer deposited on its surface. P-type substrates, while less common, occur as well. Many commercial LEDs, especially GaN/InGaN, also use sapphire substrate.

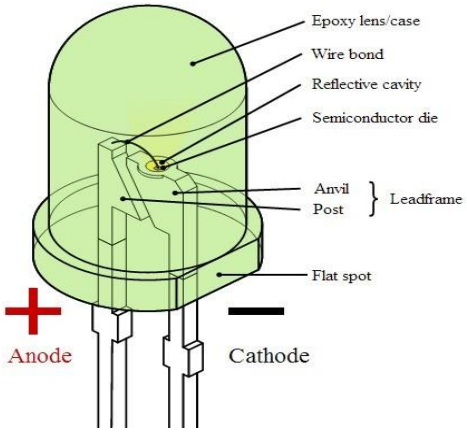


Fig. 3.4 LED

3.5 ULTRASONIC SENSOR

HC-SR04 Hardware Overview

At its core, the HC-SR04 Ultrasonic distance sensor consists of two ultrasonic transducers. The one acts as a transmitter which converts electrical signal into 40 KHz ultrasonic sound pulses. The receiver listens for the transmitted pulses. If it receives them, it produces an output pulse whose width can be used to determine the distance the pulse travelled. As simpleas pie!

The sensor is small, easy to use in any robotics project and offers excellent non-contact range detection between 2 cm to 400 cm (that's about an inch to 13 feet) with an accuracy of 3mm. Since it operates on 5 volts, it can be hooked directly to an Arduino or any other 5V logic microcontrollers.

Here are complete specifications:

Operating Voltage	DC 5V
Operating Current	15mA
Operating Frequency	40KHz
Max Range	4m
Min Range	2cm
Ranging Accuracy	3mm
Measuring Angle	15 degrees
Trigger Input Signal	10µS TTL pulse
Dimension	45 x 20 x 15mm

Table 3.5 About Ultrasonic Sensor

HC-SR04 ULTRASONIC SENSOR

Pinout of Ultrasonic Sensor

Fig. 3.5 Ultrasonic Sensor

VCC is the power supply for HC-SR04 Ultrasonic distance sensor which we connect the 5V pin on the Arduino.

Trig (Trigger) pin is used to trigger the ultrasonic sound pulses.

Echo pin produces a pulse when the reflected signal is received. The length of the pulse is proportional to the time it took for the transmitted signal to be detected.

GND should be connected to the ground of Arduino.

How Does HC-SR04 Ultrasonic Distance Sensor Work?

It all starts, when a pulse of at least 10 µS (10 microseconds) in duration is applied to the Trigger pin. In response to that the sensor transmits a sonic burst of eight pulses at 40 KHz. This 8-pulse pattern makes the "ultrasonic signature" from the device unique, allowing the receiver to differentiate the transmitted pattern from the ambient ultrasonic noise.

The eight ultrasonic pulses travel through the air away from the transmitter. Meanwhile the Echo pin goes HIGH to start forming the beginning of the echo-back signal.

In case, if those pulses are not reflected back then the Echo signal will timeout after 38 mS (38 milliseconds) and return low. Thus a 38 mS pulse indicates no obstruction within the range of the sensor.

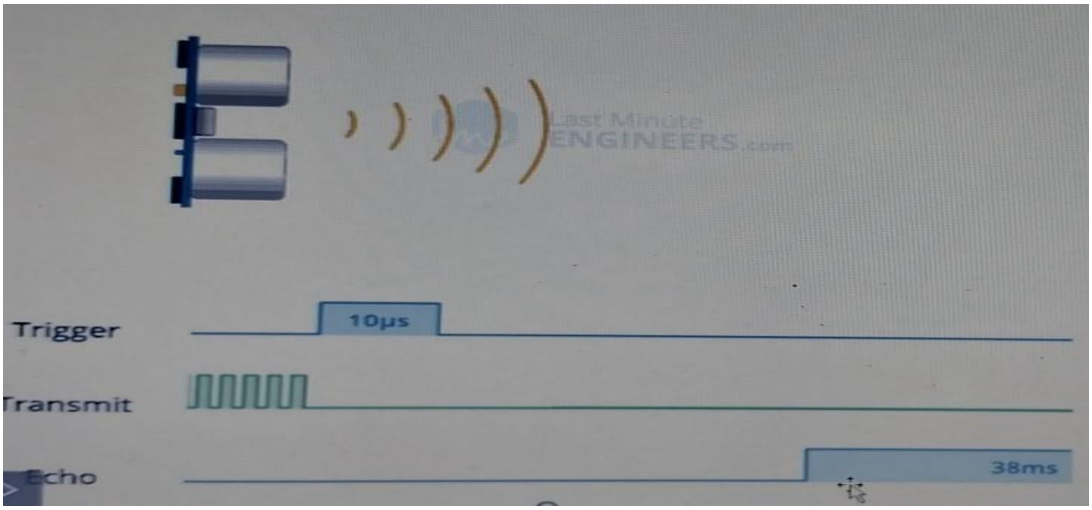
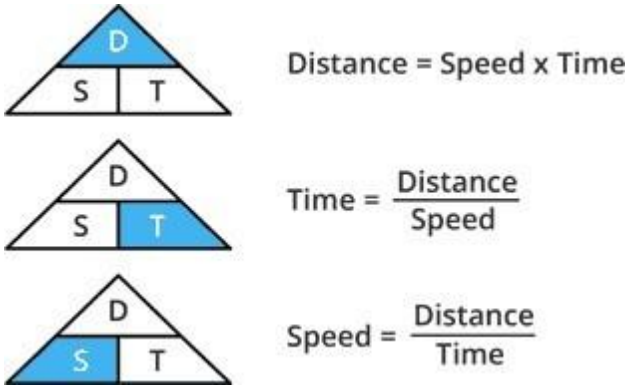


Fig. 3.5(a) How HC- SR04 Ultrasonic Sensor Works

If those pulses are reflected back the Echo pin goes low as soon as the signal is received. This produces a pulse whose width varies between 150 µS to 25 mS, depending upon the time it took for the signal to be received.

The width of the received pulse is then used to calculate the distance to the reflected object. This can be worked out using simple distance-speed-time equation, we learned in High school. In case you forgot, an easy way to remember the distance, speed and time equations is to put the letters into a triangle.



Let’s take an example to make it clearer. Suppose we have an object in front of the sensorat

an unknown distance and we received a pulse of width 500 µS on
the Echo pin. Now let's calculate how far the object from the sensor is. We will use the below equation.

Distance = Speed x Time

Here, we have the value of Time i.e. 500 µs and we know the speed. What speed do we have? The speed of sound, of course! Its 340 m/s. We have to convert the speed of sound into cm/µs in order to calculate the distance. A quick Google search for "speed of sound in centimeters per microsecond" will say that it is 0.034 cm/µs. You could do the math, but searching it is easier. Anyway, with that information, we can calculate the distance!

Distance = 0.034 cm/µs x 500 µs

But this is not done! Remember that the pulse indicates the time it took for the signal to be sent out and reflected back so to get the distance so, you'll need to divide your result in half.

Distance = (0.034 cm/µs x 500 µs) / 2Distance = 8.5 cm

So, now we know that the object is 8.5 centimeters away from the sensor.

3.6 Piezo buzzer

A buzzer is in the mechanical form of a small rectangular or cylindrical housing, with electrical connection for direct mounting on rigid printed circuit, or with electrical connection consisting of flexible electrical son. In the latter case, the buzzer has two small brackets. The loudness of such a component is about 85 dB / cm (note that it does not specify the sound level meter - as for HP, as a business perspective, it would seem probably too little power. As for sweets which are given the price per 100g and not for one kilogram).

Fig. 3.6 Piezo Buzzer

It requires a DC voltage to operate, it should generally be between 3 V and 28 V, depending on the model. A buzzer designed to operate at 6 V generally works very well for any supply voltage between 4 V and 8 V, and a buzzer designed to operate at 12 V can work perfectly at a voltage between 6 V and 28 V (see characteristics given by the manufacturer for not making stupidity). There are also buzzers that work directly on the AC mains 230 V. This type of buzzer is convenient to use, because unlike piezoelectric buzzers simple (simple piezoelectric transducers without associated electronics), it has no work, except of course the eventual

control stage which will enable it. He provides a simple DC voltage and presto, it sounds.

Simple Piezo-electric: - A buzzer (transducer) piezoelectric requires an AC voltage to operate, a few volts to several tens of volts (3V to 30V for example). It presents an optimal resonance frequency a few kHz (between 1 kHz and 5 kHz in general, eg, 2 kHz, 2.8 kHz or 3 kHz). Itis this type of transducer that can be found on the back of the watch with an alarm function.

CHAPTER 4

SOFTWARE IMPLEMENTATION

4.1 Software Introduction:

Software introduction:

Arduino IDE is an open-source software, designed by Arduino.cc and mainly used for writing, compiling & uploading code to almost all Arduino Modules.

It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.

It is available for all operating systems i.e. (MAC, Windows, Linux and runs on the Java) Platform that comes with inbuilt functions and commands that play a vital role in debugging, editing and compiling the code.

A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonnardo, Arduino Micro, and many more Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code

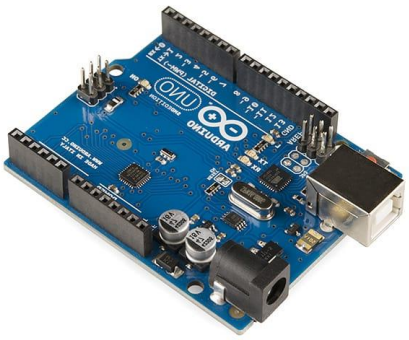


Fig 4.1 ARDUINO

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

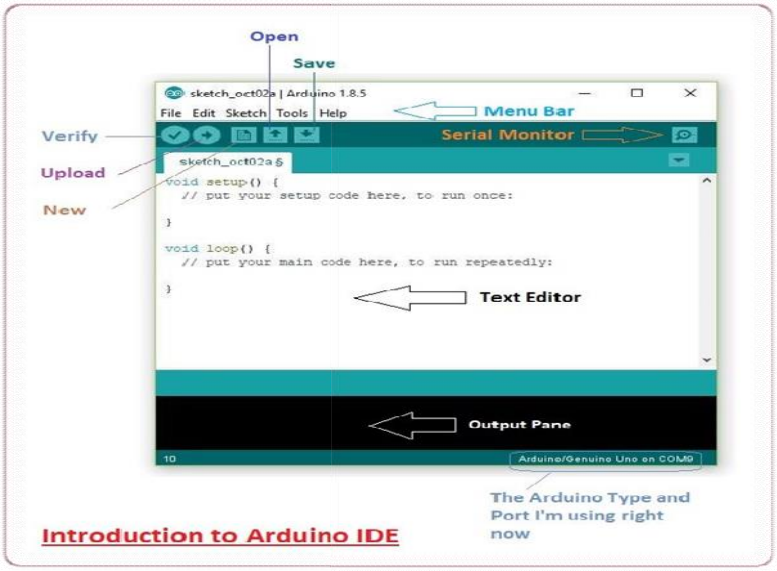
You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring),

and the Arduino software (IDE), based on processing.

Over the years, Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform.

ABOUT IDE

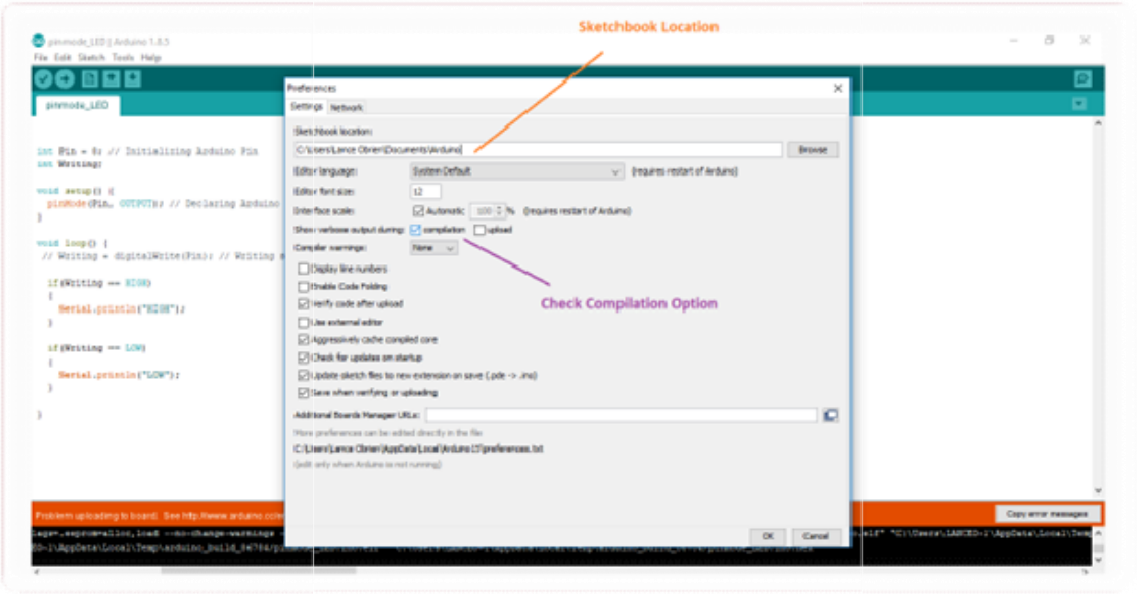
***Menu Bar *Text Editor *Output Pane**



The bar appearing on the top is called **Menu Bar** that comes with five different options as follow

File	
New	This is used to open new text editor window to write your code
Open	Used for opening the existing written code
Open Recent	The option reserved for opening recently closed program
Sketchbook	It stores the list of codes you have written for your project
Examples	Default examples already stored in the IDE software
Close	Used for closing the main screen window of recent tab. If two tabs are open, it will ask you again as you aim to close the second tab
Save	It is used for saving the recent program
Save as	It will allow you to save the recent program in your desired folder
Page setup	Page setup is used for modifying the page with portrait and landscape options. Some default page options are already given from which you can select the page you intend to work on
Print	It is used for printing purpose and will send the command to the printer
Preferences	It is page with number of preferences you aim to setup for your text editor page
Quit	It will quit the whole software all at once

As you go to the preference section and check the compilation section, the Output Pane will show the code compilation as you click the upload button.



And at the end of the compilation, it will show you the hex file it has generated for the recent sketch that will send to the Arduino Board for the specific task you aim to achieve.

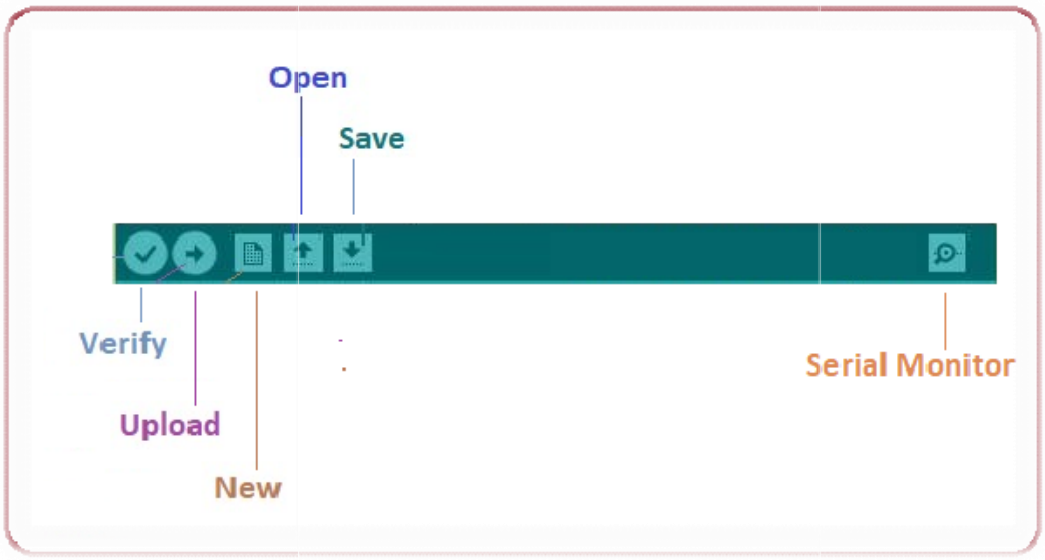
Edit - Used for copying and pasting the code with further modification for font

Sketch - For compiling and programming

Tools - Mainly used for testing projects. The Programmer section in this panel is used for burning a bootloader to the new microcontroller.

Help - In case you are feeling skeptical about software, complete help is available from getting started to troubleshooting.

The **Six Buttons** appearing under the Menu tab are connected with the running program as follows.



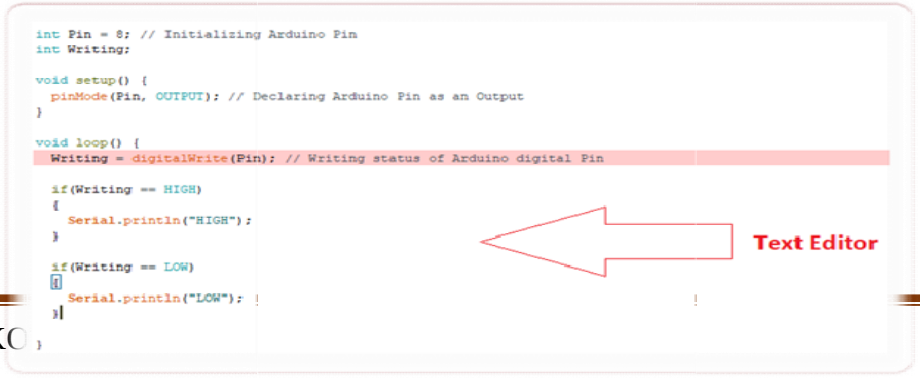
The checkmark appearing in the circular button is used to verify the code. Click this once you have written your code.

The arrow key will upload and transfer the required code to the Arduino board. The dotted paper is used for creating a new file.

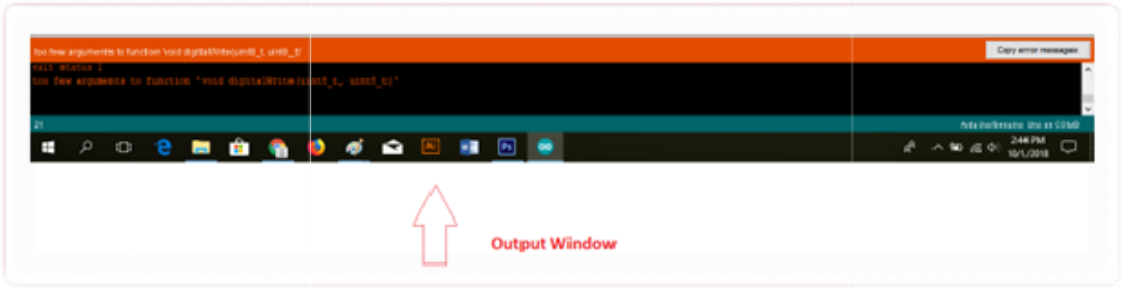
The upward arrow is reserved for opening an existing Arduino project. The downward arrow is used to save the current running code.

You need to select the baud rate of the Arduino Board you are using right now. For me Arduino Uno Baud Rate is 9600, as you write the following code and click the Serial Monitor, the output will show as the image below.

The main screen below the Menu bard is known as a simple text editor used for writing the required code.



The bottom of the main screen is described as an Output Pane that mainly highlights the compilation status of the running code: the memory used by the code, and errors that occurred in the program. You need to fix those errors before you intend to upload the hex file into your Arduino Module.



More or less, Arduino C language works similar to the regular C language used for any embedded system microcontroller, however, there are some dedicated libraries used for calling and executing specific functions on the board.

4.2 PROGRAM:

```
//VISIT: www.srrobotics.in
const int pingTrigPin = A4;
const int pingEchoPin = A5;
int led=13; //Buzzer to PIN 4
int buz1=9;
void setup () {
Serial. Begin (9600);
pinMode (led, OUTPUT);
pinMode (buz1, OUTPUT);
}
void loop ()
{
long duration, cm;
pinMode (pingTrigPin, OUTPUT);
digitalWrite (pingTrigPin, LOW);
delayMicroseconds (2);
digitalWrite (pingTrigPin, HIGH);
delayMicroseconds (5);
digitalWrite (pingTrigPin, LOW);
pinMode (pingEchoPin, INPUT);
duration = pulseIn (pingEchoPin, HIGH);
```

```
cm = microsecondsToCentimeters(duration);
if (cm<=50 && cm>0)   // distance yaha set krna h
{
int d= map (cm, 1, 300, 10, 1000);
digitalWrite (led, HIGH);
digitalWrite (buz1, HIGH);
delay (50);
digitalWrite (led, LOW);
digitalWrite (buz1, LOW);
delay(d);
}
Serial.print(cm);

Serial.print("cm");
Serial.println();
delay (40);
}
long microsecondsToCentimeters (long microseconds)
{
return microseconds / 29 / 2;
}
```

CHAPTER 5

RESULTS

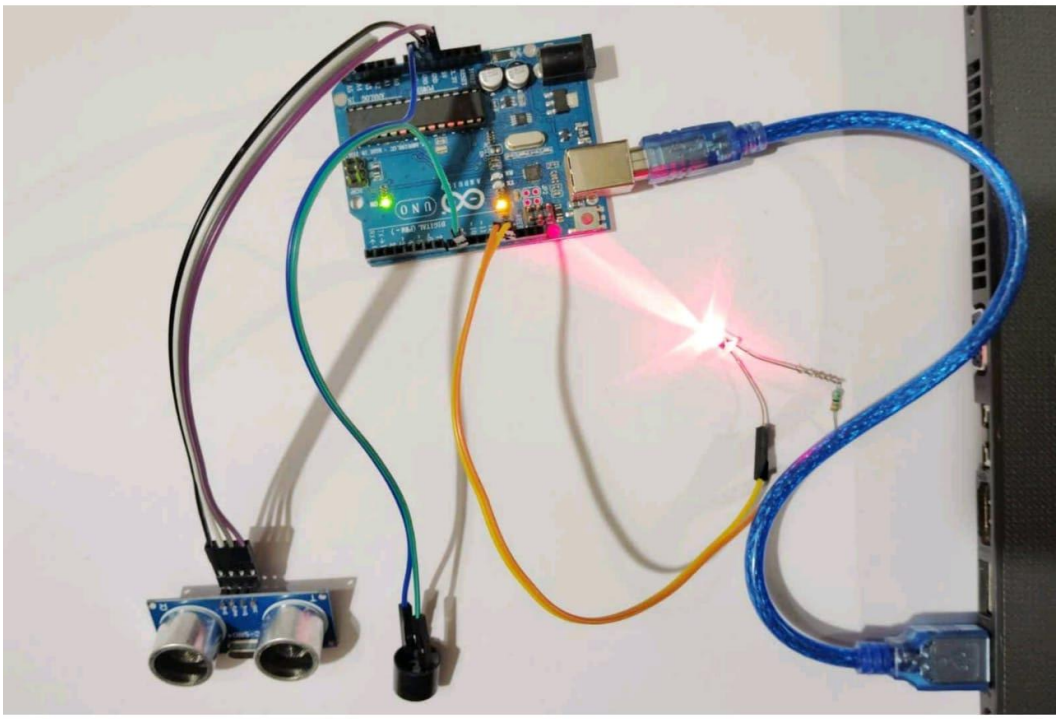


Fig. 5 Result of Project

The Ultrasonic sensor or HC-SRO4 is used to measure the distance of the object using SONAR. It emits the Ultrasound at a frequency of 40KHZ or 40000 Hz. The frequency travels through the air and strikes the object on its path. The rays bounce back from the object and reach back to the module. The four terminals of HC-SRO4 are VCC, TRIG, ECHO, and GND. The voltage supply or VCC is +5V. We can connect the ECHO and TRIG terminal to any of the digital I/O pin on the specific Arduino board. The Ultrasonic sensors work best for medium ranges. The resolution is 0.3cm. The medium ranges of the sensor are 10cm to 3m. It works best at this duration. The maximum range the sensor may detect is 4.5m.

The importance of social distance concept was raised during the COVID period. But as COVID is not fully eradicated social distancing will still be prevalent in coming time. The problem with social distancing is people tend to forget about it every now and then. Remind every person each time is not feasible. So here we develop a wearable social distancing ID card that will remind people to maintain social distancing whenever they are too close to someone else. This system will provide an automated way to ensure social distancing. The system makes use of an ultrasonic sensor along with an at mega microcontroller, a buzzer,

some basic electronics components and pcb board to develop the system. The system provides an automated social distancing system. The ultrasonic sensor uses ultrasonic waves return time to measure the distance of any reflecting surface. This sensor data is constantly monitored by the microcontroller. Based on the sensor values the controller knows the distance of the person ahead from the person wearing it. Now using this data, the controller operates a buzzer in accordance to the distance. The buzzer buzzing pattern varies as per the distance of object from the person. The closer the person the higher the buzzing intensity. This system ensures an automatic social distance ensuring ID card using ultrasonic sensor and at mega microcontroller.

CONLUSION

The analysis and design of social distancing and alert system is presented. The proposed system is used to avoid unnecessary encounters between person to person. And also, this system used for security purpose of a person so that he or she can maintain a minimum distance of 6 feet. This paper involves avoiding encounter to unconsciousness through getting accumulate at a particular place. It's like the time when two person encounters each other after having the social distancing device wearing the ultrasonic sensors detect the presence and it's like violating the rule of getting closer to someone than maintain a 6 feet distance thus it will give a beep so it makes both persons aware.

REFERENCE

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[4] Website on Ultrasonic Sensor. https://create.arduino.cc/projecthub/abdularbi17/ultrasonic-sensor-hc-sr04-with-arduino tutorial-327ff6

[5] Website on Arduino UNO Board, https://www.arduino.cc/en/Main/arduinoBoardUno