

## Intelligent Public Transportation System

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### ABSTRACT

Article history: COVID -19 pandemic caused by the novel coronavirus is continuously spreading until now all over the world the impact of COVID-19 has been fallen on almost all sectors of development, the healthcare system is going through a . In this paper ,we propose “Intelligent public transportation system” that restrict the growth of covid-19 in transportation system This research focuses on real-time observation with. efficient use of low-cost monitoring tools used by peoples for health preventive purposes. The features of this research including i) The bus will be sanitize using ultraviolet technology ii) temperature detector is designed to identifies individuals with elevated body temperature and gives warning of temperature abnormality iii) Social distancing detection system is designed to measure and detects the distance between people standing in queues or sitting on chair. iv) seat allocation system facility to allocate a seats.user will easy to view allocating seat details. intelligent public transportation system uses an arduino microcontroller to produce an automated function.

### Keywords:

Covid-19

Arduino uno

Sanitization system

Temperature detection

Social distancing

Seat allocation

### INTRODUCTION :

Coronaviruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans and birds, they cause respiratory tract infections that can range from mild to lethal. Mild illnesses in humans include some cases of the common cold (which is also caused by other viruses, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS, and COVID-19. In cows and pigs they cause diarrhea, while in mice they cause hepatitis and encephalomyelitis. Coronaviruses constitute the subfamily Orthocoronavirinae, in the family Coronaviridae, order Nidovirales, and realm Riboviria. They are enveloped viruses with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry. The genome size of coronaviruses ranges from approximately 26 to 32 kilobases, one of the largest among RNA viruses. They have characteristic club-shaped spikes that project from their surface, which in electron micrographs create an image reminiscent of the solar corona, from which their name derives.

Coronavirus disease 2019 (COVID-19), also known as the coronavirus, or COVID, is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-cov-2). The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic. Preventive measures include physical or social distancing, quarantining, ventilation of indoor spaces, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face. Has been recommended in public settings to minimize the risk of transmits.

Public transport is the backbone of cities, providing an essential service to keep cities moving. Transportation systems help ensure that people can reach everyday destinations, such as jobs, schools, healthy food outlets and healthcare facilities, safely and reliably. Public transportation services play an important role for people who are unable to drive, including those without access to personal vehicles, children, individuals with disabilities, and older adults. Today we are facing covid 19 infections. In this situation public transport system have to be considered a high risk environment due to high no. Of people confined space with limited .in this situation we have intelligent solution for this problem caused by corona virus in public transport system. We are presenting project of “intelligent public transportation system”, by using this system we will overcome the problem caused by the corona virus in public transportation system.

This paper presents an application of intelligent public transportation system is hardware-based tem including design of a circuit (hardware) and implementation and testing on Arduino Uno board. The test results are displayed with the help of LCD display. The program is written in Arduino IDE and facilitates the display of temperature in degree centigrade and also in Fahrenheit. The Arduino Uno board facilitates the sanitization system , seat allocation and social distancing.

In our proposed system designing a intelligent public transportation system is used to minimize the risk of covid 19 contagion in public transport. Ultraviolet c type light tube is used for preventing and reducing the spread of infections and harmful micro-organism by destroying, their DNA structure . We use ultraviolet type c light on the bus interior and exteriors as a way of disinfection .this process takes 5-7min. Using a contactless sanitization system for sanitization of hands while entering people in the bus .

We use temperature detector circuit to detect temperature of person .using temperature detect circuit is the perfect way to take someone’s temp without contact. if someone’s temperature is higher than set limit then the buzzer will alert Ultrasonic sensor is used to measure social distancing of them ,while peoples boarding into the bus. In the seat allocation system, infrared sensor is used for to check where the seats are vacant or not for that we have used led. if the seats in the bus are empty the led will glow. According to the information the passenger will be take it in bus. we have provided oxygen service in this system for those people who have require medical oxygen due to low level. This will help for emergency passenger.

### **WORKING PRINCIPLE:**

Basically, our proposed system is divided into some inter-connected parts . First of all we have given all our concentration on setting up circuit design. We have connected several types of sensors with arduino uno using wires in a direction towards schematic diagram. Secondly, sending all the sensors data to the lcd to insure live monitoring .The idea is based on the problem that happen in human life nowadays by improving the intelligent public transportation system. the block diagram of the system is shown in fig

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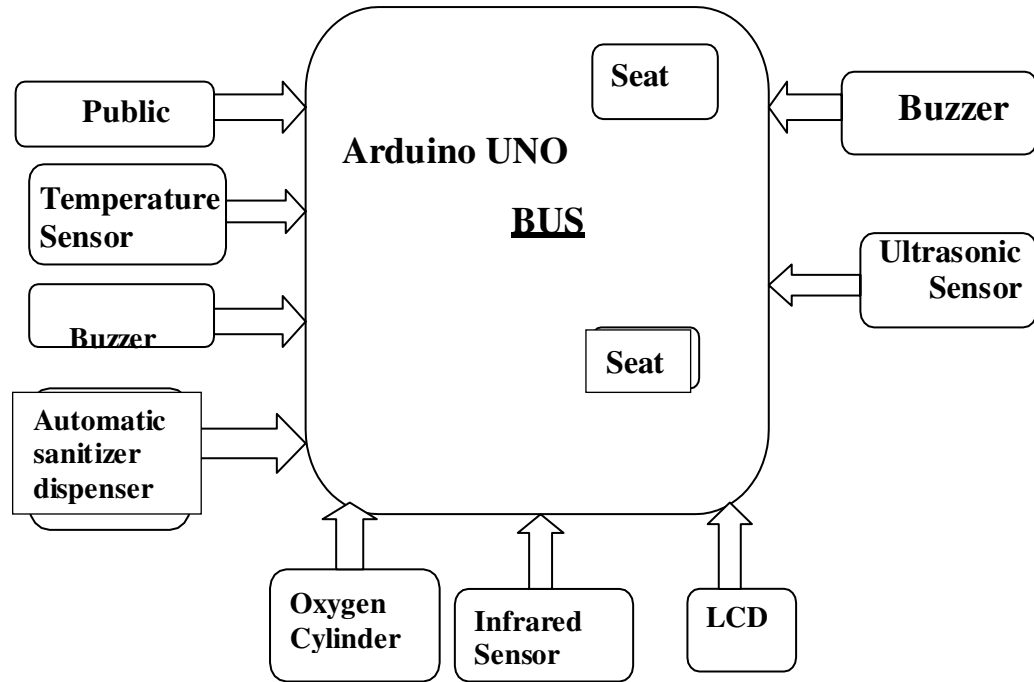


Fig. Block Diagram of intelligent public transportation system

**HARDWARE IMPLEMENTATION :**

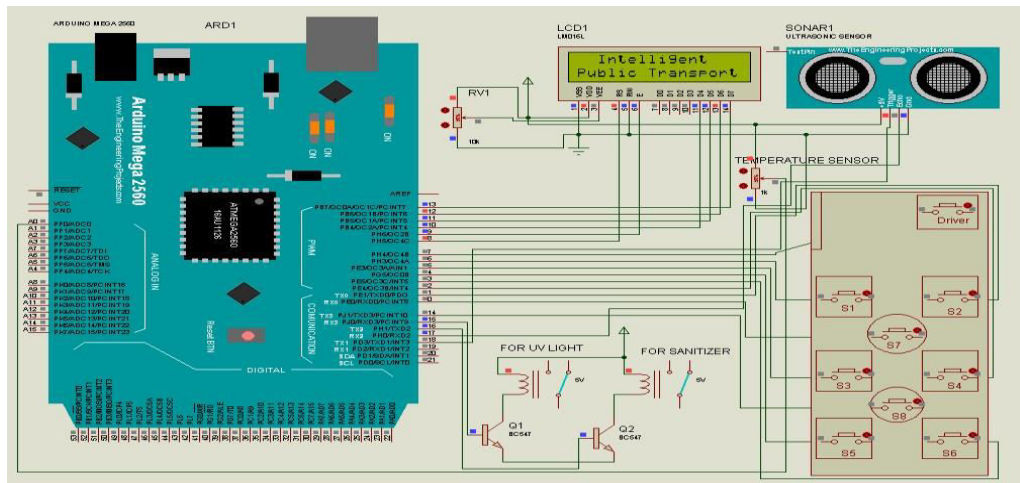


Fig .circuit diagram of intelligent public transportation system

A schematic fig shows the circuit diagram of intelligent public transportation system. In this sanitization process proceed by using the ultraviolet light. the process is continue with 10 second. The switch is provided in driver cabin for vehical lock or unlock. The message is displayed on LCD that "Please check the temperature" and reads the temperature of passenger . The IR sensor is implemented with temperature sensor for when we need to check the temperature. For this process we take 5 seconds for it. After the sanitization the door will unlock by using servo motor. The number of passengers are present in bus is counted by checking howmany IR sensors are active which is presented at each seat and it shows how many seats are occupied in the bus. The buzzer will start sounding if the passenger is moved out and it shows that the seat is available for other passenger.

**Arduino Uno:**

Arduino can be used to communicate with a computer, another Arduino board or other microcontrollers. The ATmega328P microcontroller provides UART TTL (5V) serial communication which can be done using digital pin 0 (Rx) and digital pin 1 (Tx). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The ATmega16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a .inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. There are two RX and TX LEDs on the Arduino board which will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (not for serial communication on pins 0 and 1). A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328P also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus

Once Arduino IDE is installed on the computer, connect the board with computer using USB cable. Now open the Arduino IDE and choose the correct board by selecting Tools>Boards>Arduino/ Genuino Uno, and choose the correct Port by selecting Tools>Port. Arduino Uno is programmed using Arduino programming language based on Wiring. To get it started with Arduino Uno board and blink the built-in LED, load the example code by selecting Files>Examples>Basics>Blink. Once

**Sanitization system:**

I. Ultraviolet technology:

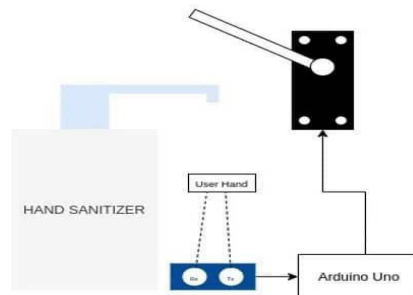
UVC radiation is a known disinfectant for air, water, and nonporous surfaces. UVC radiation has effectively been used for decades to reduce the spread of bacteria, such as tuberculosis. UVC radiation has been shown to destroy the outer protein coating of the SARS-Coronavirus, which is a different virus from the current SARS-CoV-2 virus. The destruction ultimately leads to inactivation of the virus. (see Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses. UVC radiation may also be effective in inactivating the SARS-CoV-2 virus, which is the virus that causes the Coronavirus Disease 2019 (COVID-19).

Ultraviolet c type light tube is used for preventing and reducing the spread of infections and harmful micro-organism by destroying, their DNA structure. We use ultraviolet type c light on the bus interior and exteriors as a way of disinfection .this process takes 5-7min.

II. Automatic sanitization system:-

We use contactless sanitization system for hand sanitization of people The working principle of the touchless hand sanitization system where one simply needs to just place hand near the ultrasonic sensor and instantly the sanitizer gets ejected from the bottle into the awaiting hands.

We will be using the ultrasonic sensor for the detection of the hand. The distance for detecting the hand can be easily set in the Arduino code based on your requirement. The Arduino will be repeatedly sending a signal to trigger the ultrasonic sensor and when your hand is present in front of the sensor then the sensor will output the total time taken by the sound to travel to and from the object. Then that signal is read by the Arduino. Based on that signal, we will be writing the code that when the sensor detects the hand it will turn on the hand sanitizer, and when the hand is not present in front of the sensor the hand sanitizer will be turned off. We will be using a DC water pump for this purpose.



**Fig. Automatic sanitization system**



## FUTURE SCOPE AND CHALLENGES

Since this application is intended to be used in any transportation system; accuracy and precision are highly desired to serve the purpose. This application is a solution to improving healthier environment quality which makes travelling safer. Higher number of false positive may raise discomfort and panic situation among people being observed. There may also be genuinely raised concerns about privacy and individual rights which can be addressed with some additional measures such as prior consents for such working environments, hiding a person's identity in general, and maintaining transparency about its fair uses within limited stakeholders.

This system will be integrated with the system implementing face mask recognition using image processing and machine learning that would make a complete system which can bring a dramatic impact on the spread of corona virus.

## RESULTS AND DISCUSSION:

The outbreak of coronavirus was an unexpected phenomenon that has turned the whole world into lockdown, although most scientists and individuals blame the Chinese over the spread of the disease there has been significant downfalls from healthcare setups that has made this another pandemic. Several countries have been able to impose travel restrictions and work at home measures to reduce the reproduction rate and spread of the virus among communities Social distancing can also have its own implications ,crowd gatherings which could have impacted the spread of COVID-19.

Here we proposes an efficient real-time based system which automate the process of monitoring the social distancing via object detection and tracking approaches, where each individual is identified in the real-time with the help of sensors. The generated social distancing system is identifying the clusters or groups of people.

The contactless body temperature monitoring and sanitization of person is use in a public transport during the COVID-19 situation. The concept was not complicated using a non-contact infrared temperature sensor embedded with a IOT module As expressed before Contactless sanitization & body temperature detector basically is commonly programmed non-contact and Waterless Hand sanitizer which made by Electrical and Electronic based parts. It in every way that really matters distinguishes an offer of the body with the assistance of the Arduino UNO program by utilizing this gadget everybody cleans their hands as well as estimates the internal heat level effectively and has their life from different deadliest ailments in an especially enormous manner.

### Outputs :

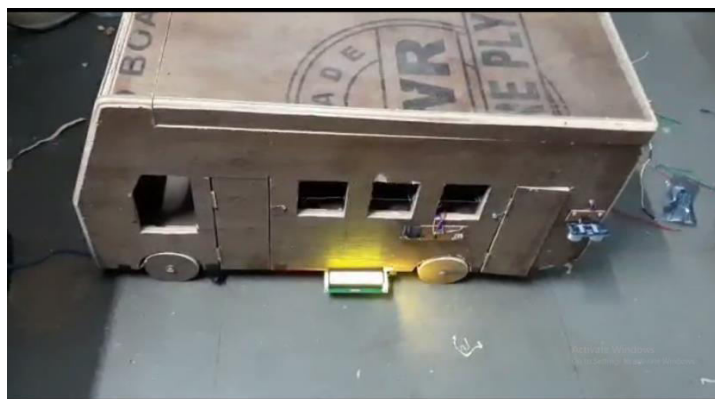
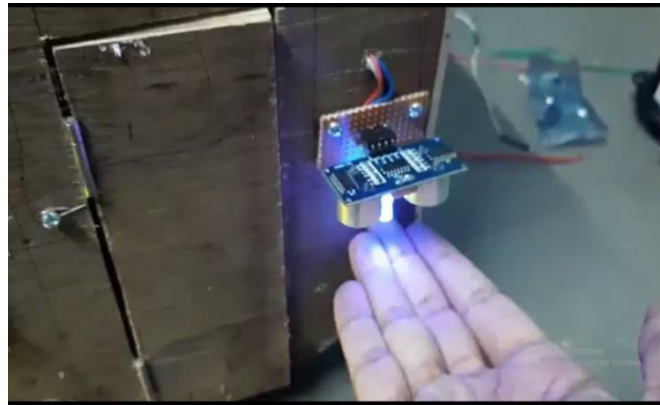
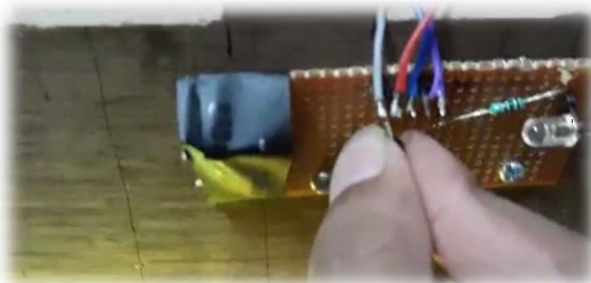


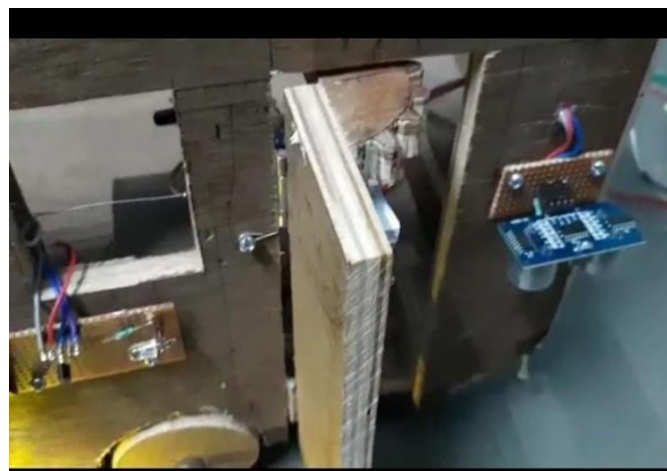
Fig.Bus module



**Fig Automatic sanitization system**



**Fig Temperature Detector Circuit**



**Fig Automatic Door Opener System.**

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