

# IOT Based System For UV-Sanitizing

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**Abstract**— IoT describes the network of physical objects “Things” that are embedded with sensor software and other technologies for the purpose of connecting and communicating over the internet. The design depicted shows the preventive measures that can be taken during the covid-19 pandemic in the whole world. Because we are still struggling with the pandemic disease (COVID-19). Human lives and livelihoods change extensively and the only way to minimizing the spread of the virus is to maintain social distancing and follow guidelines proposed by our respective government. Sanitization and sterilization have become an indistinguishable part of our daily life. Talking about sanitization and sterilization, there is a problem, we can't directly involve in the sterilization process, because there is a chance of getting the deadly virus from the contaminated space. So we introduce the smart, most efficient and powerful device for sanitizing the contaminated places. Arduino Pro mini and ultrasonic sensor plays a major role in floor sanitizing device.

**Index Terms**— first term, second term, third term, fourth term, fifth term and sixth term.

## I. INTRODUCTION

Nowdays , a critical issue faced on sanitizing and cleaning done by humans in this pandemic. One of the high-risk zones of exposure to this deadly virus is in the area where people rush to for the cure , that are the hospitals and the medical wards. Sanitization in these areas is indeed challenging and requires very high measures to be taken. But in spite of all these high-end measures taken, there is always a risk associated with it. Here we using Arduino pro mini which size is 1/6 of Arduino uno and runs at 3.3 volts. Also using HC-SR04 Ultrasonic sensor for detect the obstacles. UV-C rays are harmful for human body so we have used a laser diode to represent the UV-C LEDs. It will kill the RNA of the virus. The objectives of our project is to use the device in all public places like hospitals, schools, colleges, malls, restaurants etc.

## II. LITERATURE SURVEY

### A. Programmable and low-cost ultraviolet room disinfection device

Here is presented a room disinfection device based in Ultraviolet-C radiation . It offers the capacity to be remotely programmed using an Android mobile device and it has an infrared detection security system that turns off the system when triggered. The system here described is easily scalable to generate higher ultraviolet dosages adding more UV-C lamps. It is easily customizable. This device represents an open source, secure, fast . The device is configured in less than three minutes and it does not require continuous monitoring.

### B. Arduino based dry & wet automatic floor cleaner

This paper deals with the development of automatic floor cleaner. Our aim is to construct a floor cleaner which will be fully automatic providing dry and wet cleaning as well as UV sterilization. For its cost reduction and simplicity, we are using Arduino. It facilitates to keep their place clean and hygienic. It is a automatic floor cleaner which is capable of wet cleaning as well as dry cleaning.

### C. Automatic floor cleaner

The project is used for domestic and industrial purpose to clean the surface automatically. When it is turned ON, it sucks in the dust by moving all around the surface (floor or any other area) as it passes over it. The controller is used to drive the motors and the suction unit also a couple of sensors are used to avoid the obstacles. Reducing the human effort just by starting the cleaning unit. The cleaner is cost effective, convenient, environment friendly that saves the valuable time of any person.

### D. Floor Cleaning Robot with Mobile-App or Autonomous

The research and development of an autonomous mobile robot and a Manual Phone Application Control prototype able to vacuum cleaning a room or even an entire house is not a trivial. An autonomous vacuum cleaner robot able to randomly navigate through a room or a house with the minimum human assistance. Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. Vacuum Robot will have several criteria that are user-friendly.

## III. PROPOSED SYSTEM

We have design an IOT based device for sanitize the floor with the help of UVC rays and also used HC-SR04 Ultrasonic sensor for detect the obstacles . Use of UV-LEDs is to kill the RNA of the virus. Virus like COVID-19 can remain active on surface for a long time and UV light has been proven to destroy the RNA in viruses, thus killing it in the process, which reduces the chance of transmission.

### A. Architecture Of Proposed System

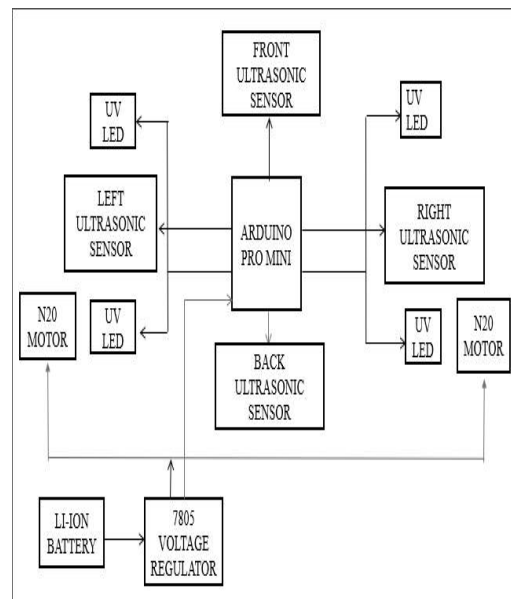


Fig. 1. System Architecture

### B. Components

#### (i) Arduino pro mini

The Arduino pro mini is a microcontroller board based on ATmega328. It has 14 digital input/output pins, 6 analog inputs, an on-board resonator, a reset button, and holes for mounting pinheaders. A six pin header can be connected to an FTDI cable or Sparkfun breakout board to provide USB power and communication to the board.

The Arduino Pro Mini is intended for advanced users who require flexibility, low-cost, and small size. It comes with the minimum of components (no on-board USB or pin headers) to keep the cost down.

(ii) HC-SR04 Ultrasonic module

It is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. The HC-SR04 Ultrasonic Distance Sensor is a sensor used for detecting the distance to an object using sonar. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The module has two eyes like projects in the front which forms the Ultrasonic transmitter and Receiver.

(iii) UV-LEDs

Ultraviolet LEDs which is responsible for killing the virus. Bio-organisms such as bacteria, viruses are known to be deactivated when exposed to UV light.

(iv) Motor driver

Motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver acts as an interface between microprocessors in robots and the motors in the robot.

(v) Obstacle Detection

We have chosen ULTRASONIC SENSOR MODULE it will detect obstacles and avoid those before a collision happens. The ultrasonic sensor uses a technique called "ECHO". "ECHO" is simply a reflected sound wave. You will have an ECHO when sound reflects back after reaching a dead end. In this device, we have four ultrasonic sensors. When an obstacle comes in front of any sensor the device will turn in to the opposite side and avoid that obstacle. For example if an obstacle comes in front of the left sensor device moves to the right.

(vi) UV sterilization

When the device is powered ON, the UV LEDs will ON and the sterilization process will continue. It has four UVC LEDs with the minimum range of nm, so it is 100% safe to operate. UV light sterilization is an environmentally friendly method of killing bacteria, mold, fungi, and viruses without the use of harmful chemicals and does not produce corrosive materials or disinfection by-products (DBPs). There are many industries where surface disinfection without the use of chemicals is critical and UV light sterilization can provide a safe, effective solution. UV disinfection and sterilization systems are proven to be: Highly effective, Cost-efficient, Chemical free.

#### IV. CONCLUSIONS

This paper is described to sanitize the surface in all public places like hospitals, schools etc with the help of device. It can perform UV sterilization and with the help of UV LEDs it is possible to kill the 90% of virus. This device is easy to handle and it is fully autonomous.

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