

SMART DISINFECTION AND SANITIZING TUNNEL

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Abstract - This project aims to sanitize the full body with fully automated circuits without the interference of humans. As there are things like automated hand sanitation now, we develop the tunnel for full-body sanitation, not just the hand. To reduce the limitation and to optimize with new technology, this project is proposed. The project is implemented by using the embedded system to detect any object or human and the Arduino as a central processing unit that controls the relay and water pump to sanitize the human or the object. When the object or human is moved further away from the range of the ultrasonic sensor the sanitation is stopped. On detecting the person, the Arduino turns on the relay to turn on the water pump. This project gives a better understanding of object detection with the computer and the use of these technologies in different forms and uses.

Key Words: Ultrasonic Sensor, 5V Relay, Arduino UNO.

1. INTRODUCTION

Infectious diseases are caused by living organisms - such as viruses, bacteria, fungi or parasites. Many living things live in our bodies and in the body. They are usually harmless or useful. But under certain conditions, some organisms might cause disease.

There are some infectious diseases can be spread from one person to another. Some are spread by insects or other animals. And you may find others by eating food or contaminated water or by exposing yourself to living things in the environment.

Signs and symptoms vary depending on the animal that causes the disease, but often include fever and fatigue. Minor infections may be able to respond to home remedies, while other life-threatening illnesses may require hospitalization.

Many infectious diseases, such as measles and mumps, can be prevented by vaccination. Regular and thorough hand washing and sanitation also help protect you from many infectious diseases.

Sanitation can refer to the cleaning and disinfection of a place or thing. An antiseptic is a chemical or compound that is used to activate or destroy microorganisms in an inactive area. Disinfecting does not mean that it kills all microorganisms, especially bacterial spores that are resistant; it does not work better than sterilization, which is

a system of the body or an overactive chemical that kills all forms of life.

Sanitizers are one-time cleaners and disinfectants. Antibiotics kill more germs than sanitizers. Antibiotics are commonly used in hospitals, dental clinics, kitchens, and bathrooms to kill germs. Sanitizers are milder compared to disinfectants and are more commonly used to clean human organisms while antibiotics are concentrated and used to clean areas such as floors and building structures.

The need for hand sanitizers has grown since the coronavirus broke out and spread around the world. Hand disinfectants are often used by throwing a sanitizer when a person presses a pump with his or her hand. This causes more people to come in contact with the pump handle, which increases the risk of transmission. Some hand sanitizers on the market are automatically injected. However, because cleaning containers and cleaning equipment are designed to be compatible only between products manufactured by the same manufacturer, consumers should also re-purchase the container for this liquid when replacing the hand cleaner.

Cleanliness means to cleanse or defecate an object or body part such as the hands or the whole body. Sanitation can be done in many ways including UV Sanitization, Soap, Alcohol Sanitization, Bleach Sanitization and more. In the above methods, alcohol has been found to be very useful for humans because it is harmless to the skin, evaporates easily and kills many germs, germs, and removes impurities from our hands. Alcohol can be expensive in cleaning up buildings or rooms on the scale and, worst of all, alcohol can be very hot and needs to be stored carefully to avoid disaster. Alcohol also dries out the hands because it absorbs moisture, so it needs to be added to lubricants. Alcohol-based antibiotics are also supplied with antibiotics such as Chlorohexidine Gluconate. The minimum amount of alcohol in hand sanitizers must be more than 70% in order to be effective in fighting germs. However, repeatedly touching the contents of the hand sanitizer to get a drop of the sanitizer also initiates contact with people, which can be dangerous. There is therefore a need for a non-contact abortion machine.

2. RESEARCH AND DATA

The outbreak of the COVID-19 virus has affected many people worldwide. Managing this real-time epidemic has

now become a major issue in the scientific community. Humans can be infected in many ways, especially through direct contact with others through the spread of contaminated droplets from the oral and nasal passages, or through contact with contaminated areas (Zhang 2020). At present, there is no vaccine, which can cure COVID-19 infection. Inadequate hygiene and hygiene practices can lead to an increase in the rate of infection during this outbreak. The virus is active for up to three hours on aerosols, up to four hours in copper, up to three days in a metal and plastic environment, and up to 24 hours in cardboard areas (Van Doremalen et al. 2020). This indicates that without proper disinfection, the virus can spread rapidly in air-contact areas. Active local and air disinfection can ensure early deterrence and prevent the spread of the virus. The literature suggests that COVID-19 infection may be successfully treated with a 0.1% sodium hypochlorite solution within 1 minute (Kampf 2020). High temperatures and high humidity can also reduce and reduce the transmission of coronavirus (Wang et al. 2020; Jithin Krishan and Subash 2019). Hand sanitizer (also known as hand disinfectant, hand disinfectant, hand scrub, or hand rub) is a liquid, gel or foam commonly used to kill many germs / germs / germs on the hands. In many cases, washing the hands with soap and water is generally preferred. Hand sanitizer is not effective in killing certain types of germs, such as Clostridium rocks, and unlike hand washing, it cannot physically remove harmful chemicals. People may improperly wipe their hand sanitizers before drying, and some do not work well because the concentration of alcohol is too low. A hand sanitizer based on alcohol at least 60% alcohol in water (especially, ethanol or isopropyl alcohol / isopropanol (rubbing alcohol)) is recommended by the United States Centers for Disease Control and Prevention (CDC), but only if soap and water are not available.

3. STUDIES AND FINDINGS

Antibodies do not provide 100% protection against disease but are an important factor in increasing the health and safety of participants. There are many benefits to disinfection procedures especially when combined with other measures. The following are some of the benefits of Disinfectant Tunnel:

- Automatic / sensor-based Sanitizing
- Safe for humans and pets
- Travel faster in densely populated areas
- Easy Installation & Easy to use
- Adjustable spray volume control
- Automatic acquisition of items
- Low operating costs

The disinfectant tunnel can be used in places where the number of visitors is high. For instance,

- Hospitals
- Hotels
- Malls
- Events / Conference & Exhibition halls
- Shops
- Offices and Workplaces
- Movie Theatres
- Supermarkets

4. SYSTEM DESCRIPTION

This project is an Embedded project-based system with the help of ultrasonic sensors and Arduino to detect and purify a person until the person is exposed to the ultrasonic sensors. Human detection is performed by ultrasonic sensors and Arduino UNO with the help of Arduino IDE. Here in this project the ultrasonic sensor is connected to Arduino and Arduino is coded using Arduino IDE in the programming language C ++. Arduino connected to a computer or power source acts as a central processing unit and a relay is used to open the pump to spray the sanitization liquid as long as one is in the ultrasonic sensor range.

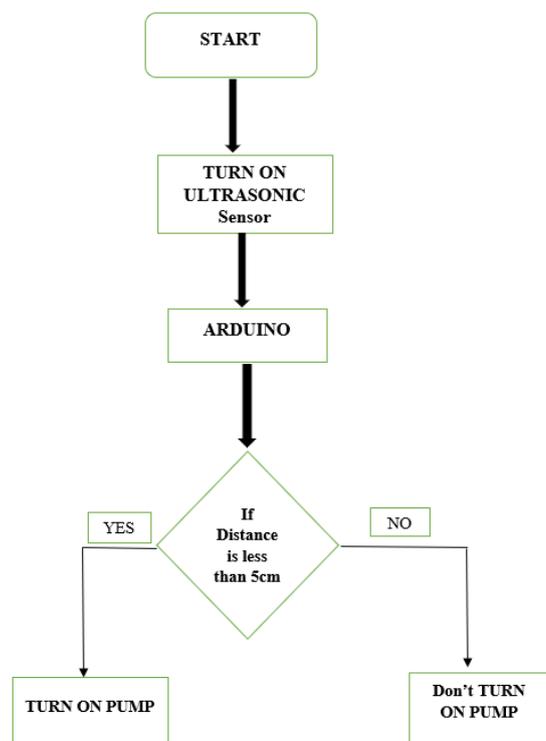


Fig 1: Block Diagram of Proposed System

5. Ultrasonic Sensor:

An ultrasonic sensor is a device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the resulting sound into an electrical signal. Ultrasonic waves travel faster than the speed of sound (i.e., noise that people can hear). Ultrasonic sensors have two main components: a transmitter and a receiver.

Ultrasonic sensors are mainly used as adjacent sensors. They can be found in car parking technology and collision safety systems. Ultrasonic sensors are also used in robotic detection systems, as well as in production technology. Compared with infrared (IR) sensors in nearby sensory systems, ultrasonic sensors are less sensitive to smoke, gas, and other particles that travel through the air (although body parts are still affected by fluid-like substances).



Fig 2: Ultrasonic Sensor

Although some sensors use a separate audio emitter and receiver, it is also possible to combine this into a single package device, with an ultrasonic switching feature between the output and receiver of signals. This type of sensor can be made in a package smaller than various items, suitable for applications where the size is very high.

6. 5V RELAY



Fig 3: 5V Relay

Relay is a single type of electro-mechanical component that acts as a switch. The relay coil is powered by DC so that the contact switches are turned on or off. A single 5V transmission module typically includes a coil, as well as two contacts such as open (NO) and usually closed (NC). This article discusses the overview of a 5V transmission module and its functionality but before we discuss what a transmission module is, we should first know what a transmission is and its PIN configuration.

5v transmission is an automatic switch that is commonly used in the automatic control cycle and high-current control using a low current signal. The input voltage of the transmission signal ranges from 0 to 5V.

The following are the features of 5V relay:

- Normal electrical power is 5V DC
- The current condition is 70mA
- The current AC load current is 10A at 250VAC or 125V AC
- The current capacity of DC is 10A in 30V DC or 28V DC
- Installs 5 anchors and is made of plastic material
- Operating time is 10msec
- Release time is 5msec
- Maximum 300 shifts per minute operation

7. Arduino UNO

Arduino Uno is a microcontroller board based on ATmega328P. Arduino UNO has 14 digital input / output pins, 6 analog inputs, 16 MHz quartz crystal, USB connection, power jug, ICSP header and reset button. It contains everything needed to support a microcontroller and we just connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

Technical Specifications

- Mini controller: Microchip ATmega328P
- Active electricity: 5 Volts
- Input Voltage: 7 to 20 Volts
- I / O Digital Anchors: 14 (6 of which can provide PWM output)
- PWM anchors: 6 (PIN # 3, 5, 6, 9, 10 and 11)
- UART: 1
- I2C: 1
- SPI: 1
- Analysis Input PINs: 6
- Current DC for each I / O pin: 20 mA
- DC Current 3.3V Pin: 50 mA
- Flash Memory: 32 KB where 0.5 KB used bootloader
- SRAM: 2 KB

- EEPROM: 1 KB
- Clock speed: 16 MHz
- Height: 68.6 mm
- Diameter: 53.4 mm
- Weight: 25 g
- ICSP Head: Yes
- Power Sources: DC Power Jack & USB Port

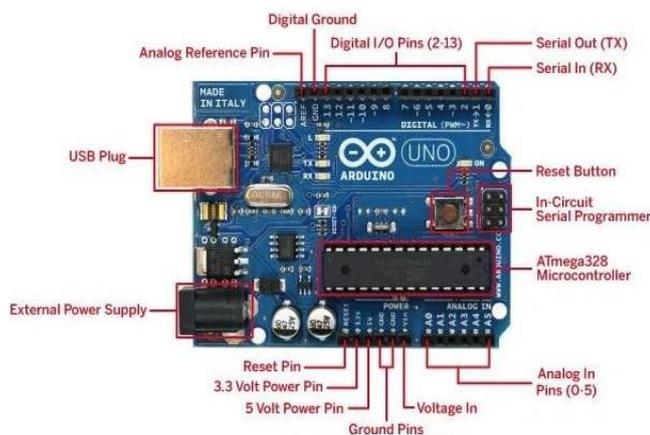


Fig 4: Arduino UNO

Programming Arduino UNO with Arduino IDE

The Arduino development board is very programmed with the help of Arduino IDE and IDE is very easy to use. Programming Arduino UNO with IDE will take at least 2-3 minutes.

8. EXPERIMENTAL SETUP

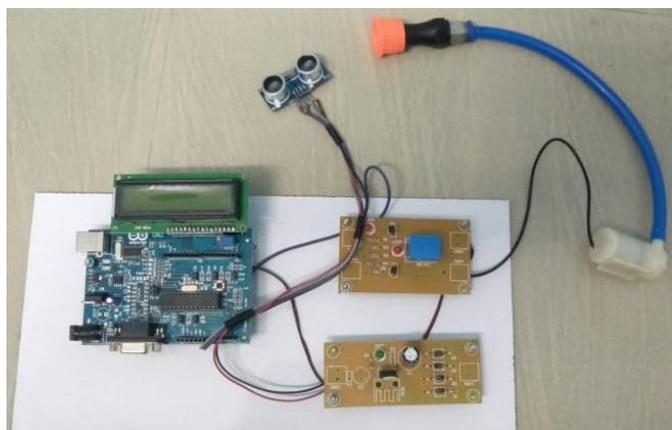


Fig 5: Basic Prototype

9. CONCLUSION

This is a simple example of a smart sanitizing tunnel mechanism that integrates all hardware components such as

Arduino UNO, ultrasonic sensors, 5v Relay, 12v Water pump and 12v adapter to connect the pump to made in Dc. Arduino may be connected to a power source or a portable computer for Arduino to unlock. As we load the code into the Arduino board it is not necessary for the Arduino board to connect to a laptop or computers so Arduino is now independent.

Since the Arduino board can only contain one scheduled, we must carefully load the codes for this project. When we load another program into Arduino Arduino automatically deletes the previous program and launches a new system. In purchasing a new Arduino the board contains a flashing system now we have deleted the system and used the board for this project.

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