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Automatic Hand Sanitizer Using Ultrasonic Proximity Sensor HC-SR04 for Laboratory Artificial Intelligence National University

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Abstract: Hand Sanitizer during the pandemic covid 19 is useful and needed by the community to clean hands, many of the Hand Sanitizers currently circulating among the public are still manual, this is mainly for needs in the Artificial Intelligence Laboratory of the National University, useful for students who want to use it. Hand Sanitizer which is still manual can be used by many people, by many students it is alternately possible to spread a dangerous virus. So we need an automatic hand sanitizer that can help reduce the spread or spread of a virus and keep it clean. This tool is made by changing the way the hand sanitizer works from manual to automatic, and it is more clean because it doesn't always change and doesn't touch. This tool works when the sensor detects the hand is less than 15 cm, then the servo pulls the lever and releases the hand sanitizer.

Keywords: Automatic Hand Sanitizer, Ultrasonic Proximity Sensor, Artificial Intelligence Laboratory

1. Introduction

Health is the most important priority in our life. One way to keep our bodies healthy is to wash our hands regularly. After doing daily activities, our hands must be contaminated with microbes or viruses, so the hands are intermediaries for the entry of microbes or viruses into our bodies that can cause disease for our bodies. Corona virus is called COVID-19 This virus attacks the respiratory tract and spreads very quickly and can spread direct physical contact such as shaking hands. One of the efforts to reduce and overcome the spread of the virus is to be more diligent in washing our hands.

One way to wash your hands properly is using soap and running water, but if you are traveling or cannot use running water and soap, then use a hand sanitizer. Hand sanitizers generally contain 70% alcohol, softeners, and moisturizers. Manual hand sanitizer by pressing or opening the lid of the container. This is less efficient, less effective, and also less than optimal hygiene, moreover it is used by many people which allows transmission of viruses or microbes due to being handled directly, so we hereby use the title of this research Automatic Hand Sanitizer Using Ultrasonic Proximity Sensor HC-SR04 For the National University Artificial Intelligence Laboratory. It is hoped that this automatic hand sanitizer, especially in the laboratory, can help solve problems that occur and students who want to use the laboratory can wash their hands as often as possible

Research Purposes

- Make an Automatic Hand Sanitizer tool with Arduino uno by using an Ultrasonic sensor as a sensor to detect the distance of an object
- Make large water output based on hand distance with Micro Servo
- Helping the community, especially students at the National University for the application of a new culture in the new normal for the prevention of the COVID-19 virus
-Automatic hand sanitizer that can help reduce the potential for the spread or transmission of a virus and keep it clean

Research Benefits

The benefit of this paper is that the Arduino Uno-based automatic hand sanitizer can increase awareness for students to be diligent in washing their hands at least using a sanitizer to prevent the transmission of the covid 19 virus, especially if students want to enter, using the Artificial Intelligence Laboratory of the National University

2. Method

Hand Sanitizer

Hand Sanitizer is a product for cleaning hands that is based on or contains alcohol which can be in the form of a gel or watery liquid. This hand sanitizer product is used by the public to clean hands to keep them clean from bacteria or viruses. Hand Sanitizer is currently a product that is sought after and bought by many

people because it is easy, efficient and practical to use and can also be used anywhere.

How to use Hand Sanitizer

- First, pour hand sanitizer all over our hands and rub hand sanitizer all over our hands. It is more important between the fingers, on the front and back of our hands, and under the nails by rubbing them into the palms of our hands.
- Second, we continue to rub until the hand sanitizer is completely dry,
- Third, don't let us wipe our hands on our pants or on our clothes because it will reduce the effectiveness of the hand sanitizer.

Types of Hand Sanitizer

Hand Sanitizer Gel product. The gel here is considered easier to apply and use. This gel antiseptic also has and provides a soft feel for the skin of the hands. In addition, antiseptic gel is also available in the form of small packages that can be used and carried everywhere if we travel.

Hand Sanitizer Spray product. The spray here is more liquid or runny than the gel form and is not sticky on the skin of the hands.

Arduino Uno

Arduino Uno is a microcontroller from Arduino which has an ATMEL Atmega328P controller IC. There are 14 digital input output pins of which 6 are analog output pins, 6 analog input pins, 16 MHz clock speed, USB to Serial port, power supply jack, ICSP header and reset button.

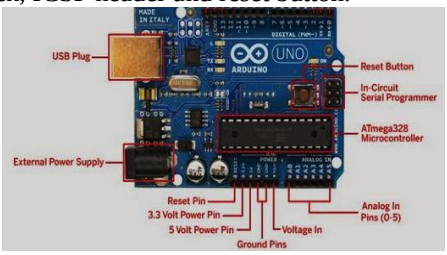

Figure 1 Arduino Uno

Motor Sensor MG996r

Servo motor is a component of an electronics in the form of a motor that has a feedback system that is useful for providing information from an actual motor rotation position on a microcontroller circuit.

Figure 2 Motor Sensor MG996r

Sensor Ultrasonik HC-SR04

The HC-SR04 sensor here is an ultrasonic sensor that can be used to measure the distance between objects and sensors. The HC-SR04 sensor has 2 components, namely ultrasonic transmitter and ultrasonic receiver. The usefulness of the ultrasonic transmitter is that it can generate a wave from the ultrasonic, then if the ultrasonic receiver takes or gets the results of the reflection of the ultrasonic wave on an object.

Figure 3 Sensor Ultrasonik HC-SR04

3. Research Methodology

Data collection methods used in this study:

a. Observation is done by direct observation with conditions at the National University, especially in the Artificial Intelligence Laboratory
b. Literature study is carried out by collecting data by collecting all materials such as literature, journals, papers, reading books related to the research title.

Tools and Materials	Amount
Arduino Uno R3	1 Pcs
Servo MG996r	2 Pcs
Sensor Ultrasonik HC-SR04	1 Pcs
Cable Jumper	20 Pcs
Bread board 400 Lubang	1 Pcs
Bottle Sanitizer	1 Bottle

Table 1: Tools and Materials

Desain

Automatic hand sanitizer is a tool that is made and designed to help and reduce direct contact with the sanitizer container when used by many people interchangeably. Below is the Block / Flow diagram of the product presented.

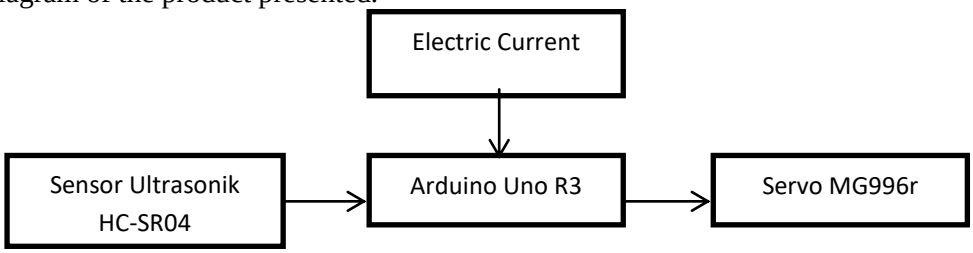

Figure 4 Blok Diagram Hand Sanitizer

The way this automatic hand sanitizer works is to use an ultrasonic sensor to detect and read our hands at a certain distance and Arduino Uno as a reading and controlling tool for this hand sanitizer system, the output of this system is a servo motor which is used to pull the rope to press the bottle cap. on the hand sanitizer to remove the liquid

Flow chart

Flowchart is the flow of making automatic hand sanitizer based on programming language. The flow chart is one of the work systems or processes in the manufacture of hand sanitizers that will be produced.

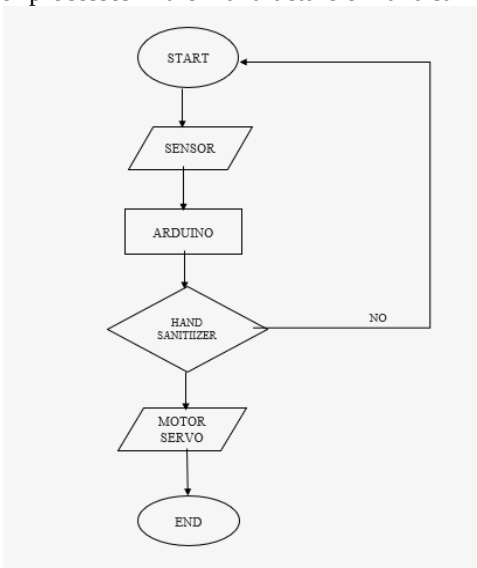

Figure 5 Flowchart How Works Handsanitizer

4. Conclusion

Making Steps

The initial step or the first process we do is to connect the Arduino uno with the Breadboard by inserting the Jumper cable into the Pin and then inserting it into the red cable point and inserting the jumper cable to the GND Pin to the negative connection point, the blue dot.

The next step is to use 2 servo motors that are on the right and left of the bottle so that the pull is faster and connect the two servo motors with a cable that is connected to the Arduino uno, the red cable on the servo motor is connected to the positive breadboard box, for the blue cable connected to the Arduino on the breadboard and the orange jumper cable is connected to the Arduino PIN.

Result

After going through some planning, preparation of tools and materials, testing and manufacturing steps related to the design of an Automatic Hand Sanitizer Using the HC-SR04 Ultrasonic Proximity Sensor for the Artificial Intelligence Laboratory of the National University, the results for the tool show and show if overall this tool can function, be useful and run properly, correctly, efficiently and can generate positive results for Automatic Hand Sanitizer in Artificial Intelligence Laboratory. The following is an image of the assembly of the tool that can be seen from the image below :

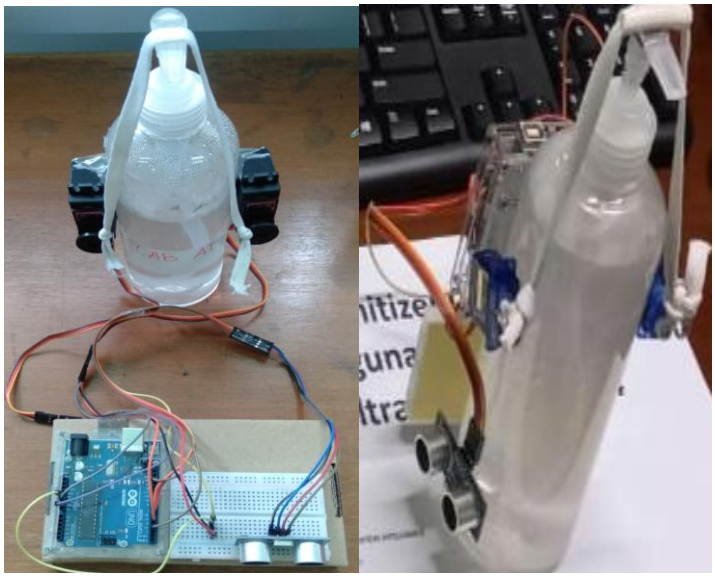

Figure 6 and 7 Automatic Hand Sanitizer

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