Arduino Uno Based Automatic Hand Sanitizer, Servo, and Infrared Sensor

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ABSTRACT

Hand Sanitizer is a hand sanitizer that has antibacterial ability to inhibit and kill bacteria. There are two types of Hand Sanitizer, namely Hand Sanitizer gel and Hand Sanitizer spray. Currently, countries in Asia and Europe, including Indonesia, are being hit by disasters, one of which is the Corona virus. Based on this problem, an Arduino Uno-Based Automatic Hand Sanitizer was made using a Sensor which aims to reduce the spread of the virus by taking precautions such as cleaning hands, minimizing direct contact with other people, and reducing touching objects in public places that are often touched by many people. This tool uses an infrared sensor, where this sensor detects objects that are blocking it and the servo motor will rotate to press the bottle cap of the Hand Sanitizer. To make an Arduino Uno-Based Automatic Hand Sanitizer Using the FC-51 Infrared Sensor, this is done in several stages, namely making a program with Arduino.IDE to provide instructions that will be programmed to make it easier for users.

Keywords : Arduino Uno, Infrared Sensor, Servo Motor

1. INTRODUCTION

Along with the development of the times, almost all electronic devices around us have almost entirely adopted the science of robotics in it. Not only electronic technology devices, robotics is also adopted in the automotive sector, such as in injection motors that already utilize sensors and micro controllers in them.

The automatic hand washing device is a smart device that is controlled by the infrared barrier module sensor controller, in addition to working automatically this tool is also programmed to be able to adapt to user needs. Because this tool works automatically, our hands are more guaranteed to be clean because the user does not need to touch the faucet or soap lever to operate it.

2. LITERATURE REVIEW

There are several ways to clean hands from germs and bacteria, including by washing hands use soap and water and wash hands use hand sanitizer. Hand sanitizer in general classified into two types, namely hand sanitizers made from alcohol-based (ABHS) and non-alcoholic hand sanitizers alcohol basis (NABHS) [4]. Research on effectiveness hand sanitizer to kill germs and bacteria has been carried out by several researchers including the effectiveness of the use of hand sanitizers used in the Arab kingdom Saudi against bacterial pathogens [5], the use of benzalkonium chloride hand sanitizer that can reduce the number of

bacteria Staphylococcus aureus colonies [6], There was no significant difference significant hand sanitizer that uses alcohol and do not use alcohol in reducing the amount colony of E. Coli bacteria [7].

Apart from research related to effectiveness hand sanitizer to kill germs and bacteria, there are research on the design of hand sanitizer tools automatic, including the manufacture of automatic hand sanitizers compatible with a wide variety of containers [8], Arduino use to calculate distance between sensors with the hand placed under it using time function [9], making smart hand sanitizer with using ATmega328P [10], hand washing and automatic dryer [11].

In general, the automatic hand sanitizer system has: almost the same system in the current automatic handwash dispense soap or dispense sanitizer. Component commonly used in the manufacture of automatic hand sanitizers consists of infrared sensor, Arduino, relay module, soap pump and water and hand dryer. Infrared sensor detects distance at soap slot and sends input to Arduino. Arduino accepts input and sends data to the program module for in process. The program module performs data processing and generate instructions which are then sent back to Arduino. While Arduino gives output to the relay module [11].

3. EXPERIMENTAL

The analysis is carried out to see the needs of various components that will be used in the system including mechanics, hardware, software, to the whole system. The analysis also documents information system activities including input, processing, output, storage and control. System requirements analysis as part of the initial study aimed at identifying system-specific problems and requirements. System-specific requirements are specifications of what the system will do when it is implemented.
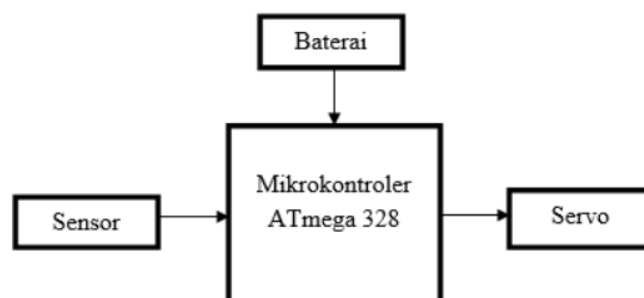
3.1 Block Diagram
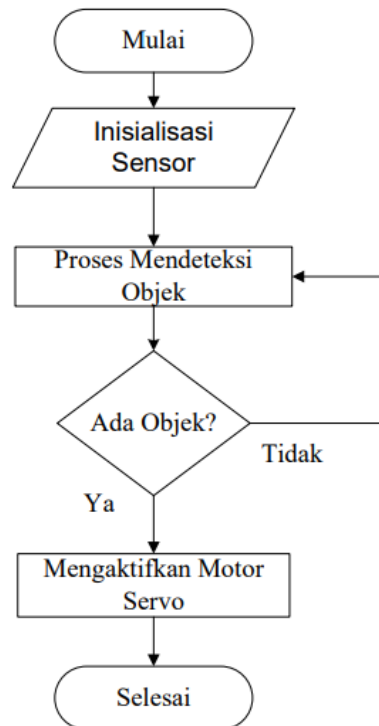

Figure 1. Block Diagram

3.2 Flowchart

Figure 2. Flowchart

4. RESULTS AND DISCUSSION

The way this automatic hand sanitizer works is when the hand is brought near to the sensor in the hand sanitizer bottle, the sensor will automatically send data to the Arduino and then Arduino gives a signal to the servo motor to pull the cap/head from the hand sanitizer bottle and the liquid will come out by itself. to the palms.

4.1 Trial Result

Figure 3. View from the front of the miniature

The automatic hand sanitizer that has been made can be used as expected, when the hand is placed on the bottom end of the bottle, the hand sanitizer liquid will come out automatically from the bottle container. The minimum distance from the palm of the hand to the hole where the hand sanitizer is issued is ± 5 cm
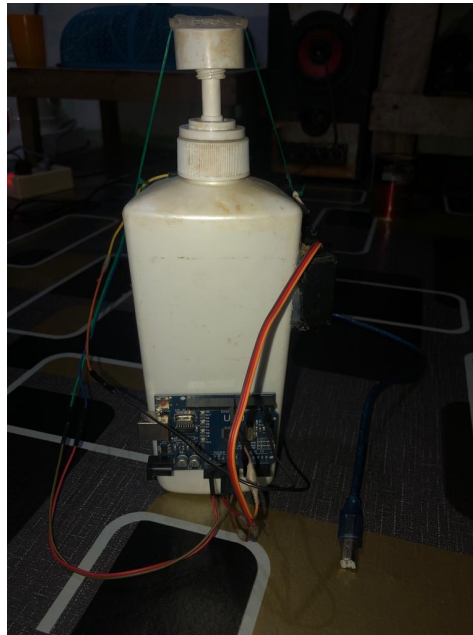

Figure 4. View from back the miniature

The automatic release of hand sanitizer liquid from the bottle is useful for reducing the user's hand contact with the bottle press from other users. So it is hoped that this automated system can reduce the spread of COVID-19.

5. CONCLUSION

From the results of the analysis and the tools that I made, the output analysis is in the form of a hand automatic sanitizer using Arduino and infrared sensor is very necessary in the new normal at this time to reduce physical contact with other people when touching the pump bottle cap. It is hoped that the tool we made can reduce the number of people infected with the virus and can make people always maintain cleanliness. Conclusions that can be drawn from the results of this study include this tool can detect hands with a distance that has been adjusted, can avoid physical contact, and hopefully the system that was built can run as expected.

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