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Arduino Microcontroller Based Sanitizer Sprinkler Robot

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Abstract: *In this paper, we tend to describe the role of AI and automation within the health care space. The planet is facing coronavirus threats and day by day it's increasing immensely. Social distancing, carrying masks, Sanitizing the hands, and disinfecting rooms area unit some preventive measures to be taken Against this deadly virus. Therefore, acceptive of such robots make sure the cleanup, sterilization, and support in hospital and similar facilities like quarantine. Hence our project aim is to disinfect the rooms, corridors, and public places by deploying mechanisms and take away the men which provides staff UN agency area unit taking active participation within the management of the COVID-19 pandemic. This analysis intends to highlight its employment with the perspective of COVID-19 management so they use hospital management will direct themselves to maximize the employment of medical robots and reduce the direct presence of medical staff. The objective of our project is to minimize human contact and increase the employment of automotive technology like sanitization with the assistance of robots. this project is controlled fully by the user. Consistent with the signal given by the user through the Bluetooth module the mechanism moves to any location. A sanitizer liquid tank is placed on the board. The pump is placed within it with an on/off signal it will work consequently. In this project, we tend to use the computer circuit includes Arduino UNO, HC-05, Motor driver, DC, and Pump motor. Bluetooth module is employed to manage and programming. The motor driver is used for the movement of the mechanism.*

Keywords: *Coronavirus; Covid-19; 2019-nCoV; SARS-Cov-2, Disinfectant; Disinfecting robot; DC motor; Bluetooth; Arduino.*

1. INTRODUCTION

Amid this international pandemic, stepping in wherever humans mustn't, robots are being employed for jobs like sanitizing hospitals and delivering food, medicine, and have been tested to be considerably helpful and handy. Robots are being deployed for administering treatment and providing support to segregated patients. The World Health Organization has suggested physical distancing for individuals around the world to stop community-level transmission of COVID-19 sanitation, which has become a vital facet in these pandemic times and plays a crucial role in preventing the United States from exposure of this deadly virus and therefore serving to in destruction of this international pandemic is incredibly vital. One among the insecure zones of exposure to the destruction rush to for the cure, that area unit the hospitals and also the medical wards. Sanitization in these areas is so difficult and needs high measures to be taken. However, despite these high-end measures taken, there's perpetually a risk related to it.

The automaton will play a very important role throughout the current pandemic state of affairs. It reduces human involvement altogether areas ranging from a patient check-up to a drug delivery system. Health organizations were conjointly taught to keep

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up social distancing from corona positive found folks. It's the important challenge for doctors and health care support staff. The govt. and medical staff are operating day and night to protect the folks from infection and infected folks. Throughout this pandemic state of affairs, several hospitals face the most important issue could be a shortage of laborers, and lots of attention people afraid to enter the patient area. Sadly, daily hospitals have to be compelled to clean their floor for malady hindrance and maintain hygiene. Recently several risky and high-touch areas, intelligent navigation, and detection systems are used.

The government and medical employees area unit operating day and night to shield the individuals from infection and infected individuals. Throughout this pandemic scenario, several hospitals face the largest issue may be a shortage of laborers, and plenty of care individuals afraid to enter the patient space. Sadly, everyday hospitals ought to clean their floors for malady hindrance and maintain hygiene. Recently several insecure and high-touch areas, intelligent navigation, and detection system area unit were used.

2. LITERATURE REVIEW

A few analysis papers associated with Arduino Microcontroller Primarily based sanitizer robots are reviewed and also the following references show influence on the book of the sensible assistant automaton. Aishwarya Pardeshi et. al, [1] This paper presents the planning, development, and invention of the model of programmed cleaner automation. This sort of automation performs machine-controlled performance with a further option like opting for and place mechanism and dirt instrumentation with air vacuum mechanism. This sort of labor is easy and useful in the betterment of the life of humans.

Vinod J Thomas et. al, [2] designed cleaner automation for domestic applications. The robotic contains a cleansing module that can be used in any space that should be as compact as doable. The operating automation is handled exploitation Associated in nursing mechanical man phone exploitation wireless BlueTooth technology. The automation was created with an Associated in nursing Arduino microcontroller at its core. The micro-controller is complemented with communication modules like Wireless BlueTooth motors and dirt suction system to figure consequently. Ajith Thomas et. al, [3] proposed an autonomous robotic for floor cleaning program. It's able to perform sucking and cleaning, detection of obstacles, and water spraying. Furthermore, it's also able to add a manual method. All hardware and software functions are manipulated by the Raspberry pi3 model.

Marcin Zukowski et. al, [4] have developed a mechanical man health care provider and companion automation dedicated to kid's hospitals. They need to be centered on automation having the ability to specify emotion and communicate with the youngsters by recognizing their faces and exploitation photos and text on the chest show to inform stories and gift academic videos. The 'ROBOT' autonomously navigates through hospital rooms and perform straight forward medical test like measurement patient's vital sign and sends the live video feed to the doctors and nurses. The automation is run exploitation ODROID XU and XU4 with Ubuntu fourteen.04 software package and incorporates a dedicated Raspberry pi a pair of the laptop to animate the robot's eyes.

Manya Jain et. al, [5] mentioned the event of Automation Floor Cleaner. The project is usually used for domestic and skilled purposes to clean the surface mechanically and manually. Once it's turned ON, it gulps among the mud particles by moving everyplace the surface (floor or the opposite area) as a result of it moves over it. The driver management mechanism is typically used to drive the motors wherever the automation having the power to maneuver and conjointly the conjointly few sensors are accustomed to discover and avoid the obstacles. This may be typically helpful in creating the approach to life higher for grouping. Marcin Zukowski et. al, [6] conferred the implementation of a patient temperature measurement system for the medical robotic assistant. They need experimented with MLX90614 infrared measuring system and FLIR Lepton thermal camera and located out that the MLX90614 infrared measuring system can't be used because of the sole input supply of the system and to urge additional correct results, and automation would want to return as shut as but zero. 3 meters to a patient's face. To beat this, they created a hybrid system having an infrared measuring system together with a thermal camera to supply close temperature and approximation skin temperature that may be wont to discover the presence of humans before of the automation.

The scope of this study is to style a sensible health care provider automation by exploring numerous contactless sensing element technologies. The automation ought to be compact for economical handling and incorporate a fast-learning real-time surrounding recognition technology for its locomotion in a very packed hospital.

3. METHODS AND MATERIALS

3.1 Block diagram

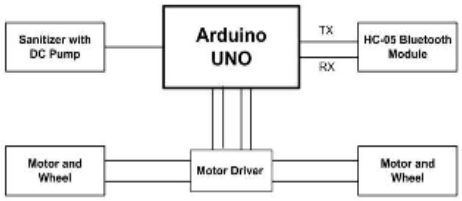

Figure 1. Working System

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Component description:

Arduino Microcontroller: Arduino Uno could be a microcontroller board supported by the ATmega328p. It has fourteen digital input/output pins (of that vi may be used as PWM outputs), vi analog input, a USB connection, an influence jack, Associated in nursing ICSP header, and a reset button

HC-05 Bluetooth Module: The Bluetooth technology manages the communication of the wireless half. The Bluetooth module will receive and transmits the info from a number system with the assistance of the host controller interface (HCI). It provides a spread of up to 10m at a transmit power of1 m watts. They vary may be extended to 100m if the transmit power is raised to one hundred m watt.

DC Motor: DC motors square measure used for the movement of the robot wherever it's connected with the motor driver, whenever the trigger signal is given to the motor driver then the motor moves according to the trigger with the given speed.

Motor Driver: It's an Associate in nursing computer circuit chip used as a motor dominant device in autonomous robots and embedded circuits. A motor driver is doubtless something that produces the motor move as per the given instruction or the inputs (high and low). it listens to the low voltage from the management/processor Associate in nursing control an actual motor that desires high input voltage.

DC Pump Motor: DC-powered pumps use DC from the motor, battery, or alternative energy to maneuver fluid in an exceeding variety of ways that motorized pumps usually operate vi, 12, 24, or 32 volts of DC power. solar-powered DC pumps use photovoltaic (PV) panels with star cells that produce direct current once exposed to daylight. Hence, a DC pump is employed to pump out the sanitizer liquid and spray it through the nozzle in an exceedingly controlled manner.

3.3 Mechanical Design

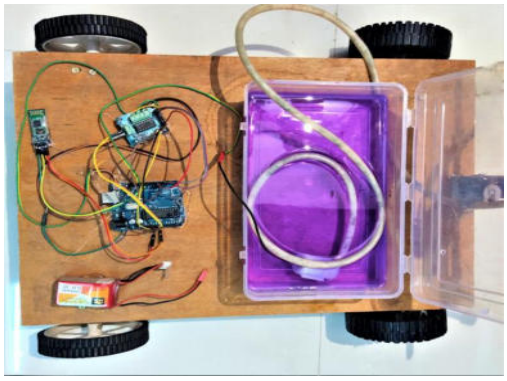

Figure 2. Top view of a Robot

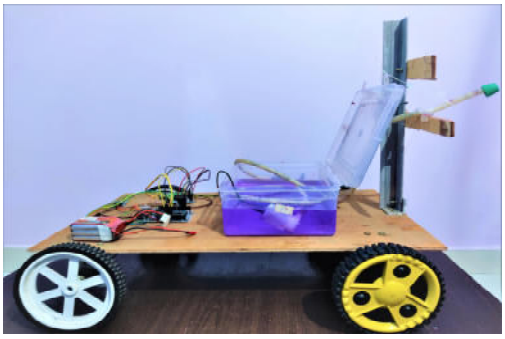

Figure 3. Side view of a Robot

3.3 Working Methodology

3.3.1 Schematic Diagram

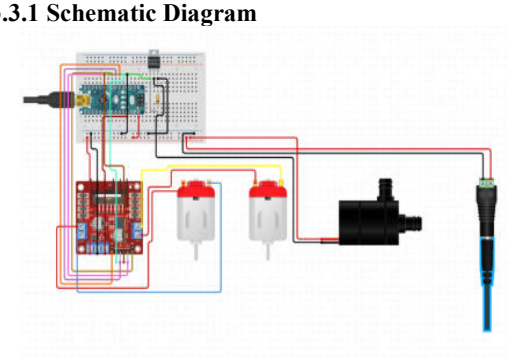

Figure 4. Schematic Diagram

3.3.2 Flow Chart

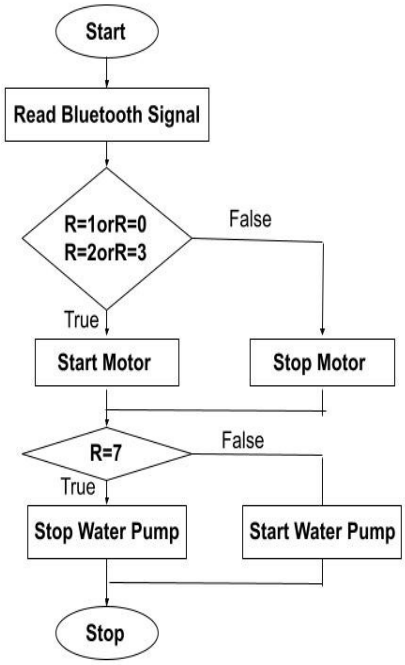

Figure 5. Main Loop

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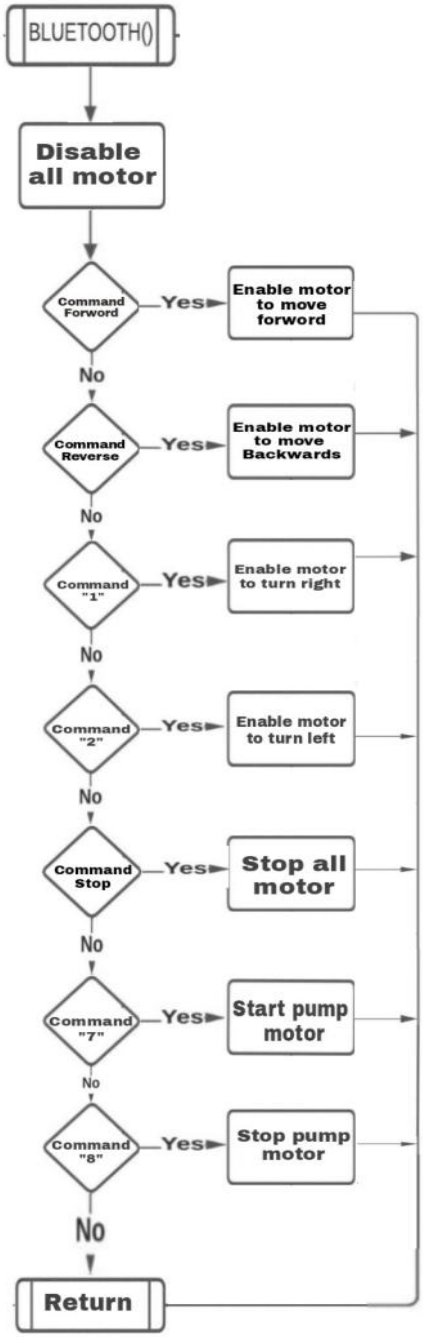

Figure 6. Remote Control Mode

4. CONCLUSION

This study provides a comprehensive summary of the potential of the automotive business, medium, and alternative square measures that are explicitly relevant to the fight against the COVID-19 pandemic. Effective deal with COVID-19, to scale back the number of infected patients and victims, and, as has been same, in the event of a deadly disease in China because it is presently these are the precise international problems.

In most of the developed countries, it will facilities alternative additives did the instrumentation and therefore the robot-based infrastructure to seem sensible the result of the fight against the illness. Comments there should be proof that its medical automaton has considerably improved the protection and quality of the health management system, as compared with a manual system, on the premise of digitizing the healthcare system. The classification of the medical robots square measure created is solely by applying the classes for every of the facet of a hospital, service, and fault-tolerant, control, and a sturdy design for reliable and secure experience within the care business.

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