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IOT Based Sanitizer Bot

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***Abstract*---Commercial places are more likely to be a source of infectious diseases than in residential places. Sanitizing reduces the growth of viruses, fungi, and types of harmful bacteria. You can clean every day, but you should always sanitize to keep your home or workplace safe. For Eg. hospitals, Industrial & commercial areas. The functioning of the IoT based sanitizer bot seems to be very simple and effective as one simply needs to control via mobile and instantly the bot moves from one place to another and spray the sanitizer / disinfectant on the required place. It can be used easily by everyone, starting from a kid to an elderly person.**
The Sanitizer bot is an IoT enabled platform, based on an several components, two servo motors, a hand sanitizer bottle, and few electrical and physical connections.

***Keywords*--- NodeMCU(ES8266), Relay, Stepper Motor, Driver IC(L293D)**

I. INTRODUCTION

Thousands of people are employed in the higher education sector and the training of students contributes long-term to innovation, advancement and economic growth. The rapid spread of COVID-19 has forced institutions to continue education through virtual means, however, the new model is not sustainable long-term. Some Universities have already made the decision to re-open in the fall, believing the economic and social costs of shutting down will be outweighed by the benefits of resuming campus life. A trending theme is emerging when planning for the reopening of higher education: Test, trace, and separate. Already, companies are scrambling to develop apps to help trace any exposure to the coronavirus—although these come with their own set of concerns. While these steps may be helpful in detecting and containing the virus, cleaning, sanitizing and disinfection need to be a primary focus to stop the spread in the first place. For spaces that have remained open or will be opening, new cleaning protocols are being implemented; strict regimens are imperative to preventing the spread of COVID-19.

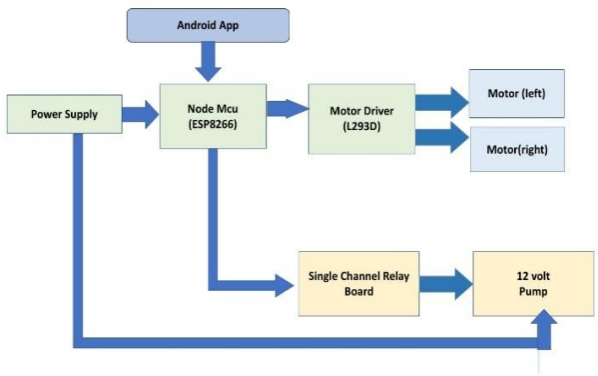
II. OBJECTIVES

The proposed system is very efficient and can be used in any public place very effectively. An intelligent robot system spraying sanitizer, to control the robot through a wireless alternative to manual completion of sanitizing and improve efficiency.

III. METHODOLOGY

Cortex-M4 main controller, wifi module, smartphone for controlling robot.3 servo motors(MG995), 6 DC motors are used, Arduino board to control motors, bluetooth module, sensors ,polythene for waterproofing. The system managed resources in robot hardware platform are limited second utilization of IoT sensors interacting with robot. Pioneer 3AT mobile robot,3 layers architecture to manage motor drivers and sensors, internet(4G modem) forcontrol and data process, android app.

IV. BLOCK DIAGRAM-



In the MIT app inventor, the App Inventor Designer allows to select the components for your app and the Ap Inventor Blocks Editor assembles program bl cks that specify how the components should behave. You assemble programs visually, fitting pieces together like pieces of a puzzle. Your app appears on the phone step-by-step as you add pieces to it, so you can test your work as you build. When you'r done, you can package your app and produce a stand-alone application to install.
When the Node Mcu is powered, it generates a hotspot. When we connect the Android phone to the Node Mcu by turning on the wifi ,we are able to monitor the working of motors and the pump jointly. The Android application uses the Android WiFiManager to connect to the access point as it would do for any other WiFi connection. It then makes an HTTP GET request to send instructions to the node mcu. You must ensure that the app is installed in your android device.

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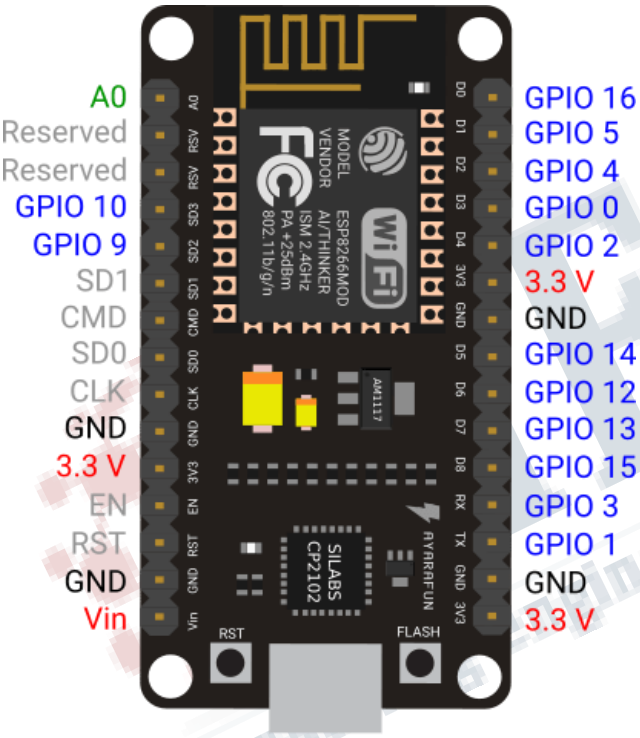
The pump will be switch on and off by a relay which ias controlled by Node Mcu When no voltage applied to the coil, COM terminal will be connected to NC (normally closed) terminal. And when the voltage is applied to the coil, electromagnetic field produced that attract the Armature, and COM and NO (normally open) terminal gets connected, that allows a much larger current to flow.When the coil is energized the armature moves from normally closed to normally open pi .The pump is set to on state.

The motors are monitored to move forward and backward with the help of same app.

The whole working is controlled by Node MCU depending upon the program dumped into it.



Node MCU –

Micro-USB: NodeMCU can be powered through the USB port

3.3V: Regulated 3.3V can be supplied to this pin to power the board,

GND: Ground pins,

Vin: External Power Supply,

EN/RST: The pin and the button resets the microcontroller, **A0:**Used to measure analog voltage in the range of 0-3.3V, **GPIO1 to GPIO16:**NodeMCU has 16 general purpose input-output pins on its board,

SD1, CMD, SD0, CLK: NodeMCU has four pins available for SPI communication.

TXD0, RXD0, TXD2, RXD2: NodeMCU has twoUART interfaces, UART0 (RXD0 & TXD0) and UART1 (RXD1 & TXD1). UART1 is used to upload the firmware/program.

Motor (60RPM)-

Operating Voltage (VDC): 3~12
Shaft Length (mm): 8.5
No Load Current: 40-180mA.
Rated Speed (After Reduction): 60 RPM
Rated Torque: 1 Kgcm
For the wheels of the bot.

Stepper Motor-

L293D Motor Driver Module is an expansion board or driver module of L293D.

L293D IC is a dual half-bridge driver IC, so the module drives the motor in any direction and speed.

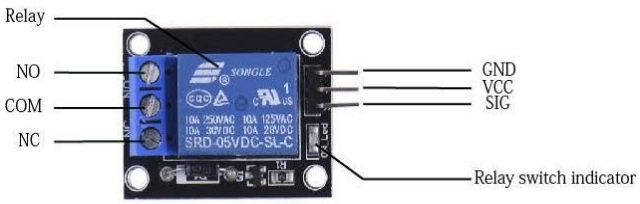
It is compatible with any controllers and processors like Arduino, AVR, PIC, etc and with an easy interface.

It makes easy to make project rather than using an IC.

Relay board-

This is 1 Channel 5V Relay Board Module For Arduino PIC AVR DSP ARM.

A wide range of microcontrollers such as Arduino, AVR, PIC, ARM and so on can control it.



Standard interface that can be compatible with microcontroller.

Pump-

This submersible pump is a mini water pump.

Its water taking capacity is up to 120 liters per hour with very low current consumption of 220 mA.

It is a small and low-cost water submersible pump with 2.5 to 6 v power supply.

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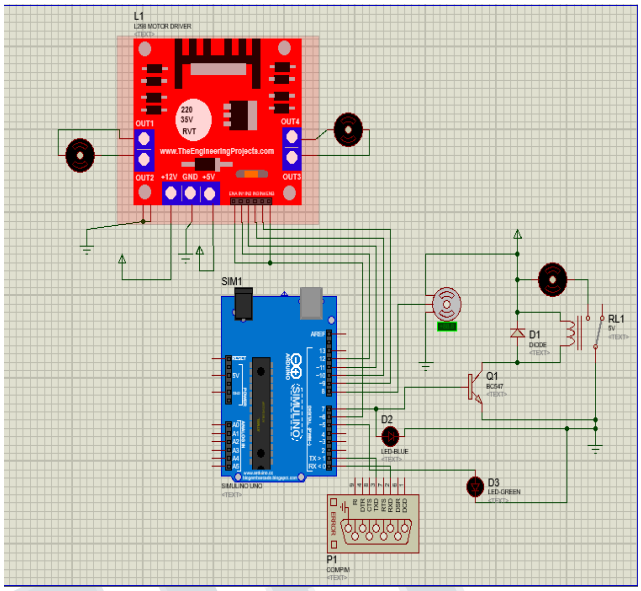
Its working is very simple, just need to connect with pipe to motor outlet, submerge with water and give power supply.

Hardware Implementation-



Software Implementation-

Arduino IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus.

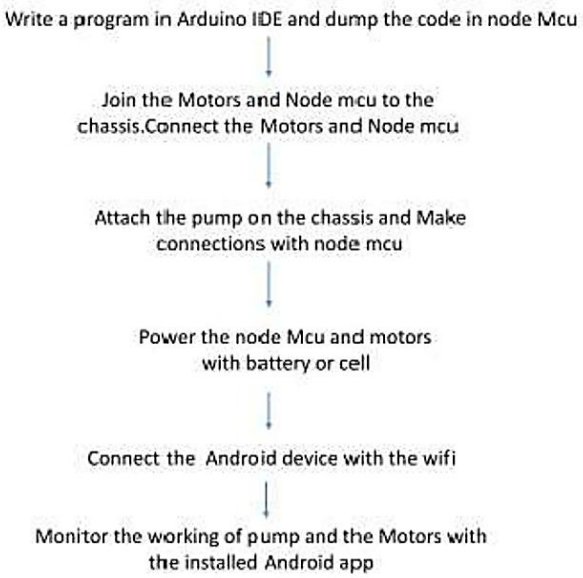
It connects to the Arduino and Genuino hardware to upload programs and communicate with them.

When you use the NodeMCU with the Arduino IDE, it will write directly to the firmware, of NodeMCU erasing the original firmware. So it becomes easy to dump code in node Mcu.

Mit App Inventor:

MIT App Inventor is an intuitive, visual programming environment that allows everyone – even children – to build fully functional apps for smartphones and tablets.

Flow Chart-



V. FUTURE SCOPE

Can be design as autonomous bot. Lidar Sensor can be implemented. With using gps, we can send coordinate local authorities By using high frequency NRF modules can be controlled as far as long Same principle can be use for large scale model.

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