COVID-19 WARRIOR

-COVID-19 PANDEMIC RESPONSE

COLLAGE –SATARA POLYTECHNIC SATARA.

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INTRODUCTION

- In todays world the COVID-19 pandemic has spread all across the world as a small response for this situation we have created a robot which can be used in COVID19 hospitals.
- COVID-19 hospitals has big issue of virus containment, the hospital premises and the surroundings has very large amount of areas infected with virus, cleaning such type of areas is a very risky job for a human being as the risk of infection is very high.
- The robot has 2 type of disinfecting modern features which are very effective against killing the COVID-19 virus
- The Robot can be controlled remotely from any smartphone with Bluetooth containing the required application.
- The robot has a container which can be using to deliver the medical equipment to the corresponding health workers in COVID-19 ward.

LITERATURE SURVEY

-“Back to January, when COVID-19 was first proven to be infectious among humans, the team spent less than 10 days to come up with the first sanitizing robot prototype and to demonstrate the feasibility of using robots. Many robotics companies followed,” says Dr. Zhang Yanliang, managing director and chief scientist at Weston Robot, Singapore

-UVD Robot is a Danish company making robots that are able to disinfect patient rooms and operating theatres in hospitals using UV –C light.

PROBLEM STATEMENT

- The COVID-19 pandemic has infected over 5 million people over the world, the no of cases are still increasing and thousands of people have died in the situation and hundreds of them were health workers which were trying to help the society.
- The situation is getting worse and the health working which are working day and night to save the people are dying daily to the infection transmitted while treating the infected COVID-19 patients.
- The virus can be controlled with some simple preventive measures such as sanitization and using the face mask for the protection.
- This robot can be used to perform the dangerous tasks which are done by the human being such as sanitizing the floor and proving masks to the COVID-19 patients.
- This robot uses 2 types of disinfecting protocols and also can be used to provide the medical equipments.

PROJECT DESCRIPTION

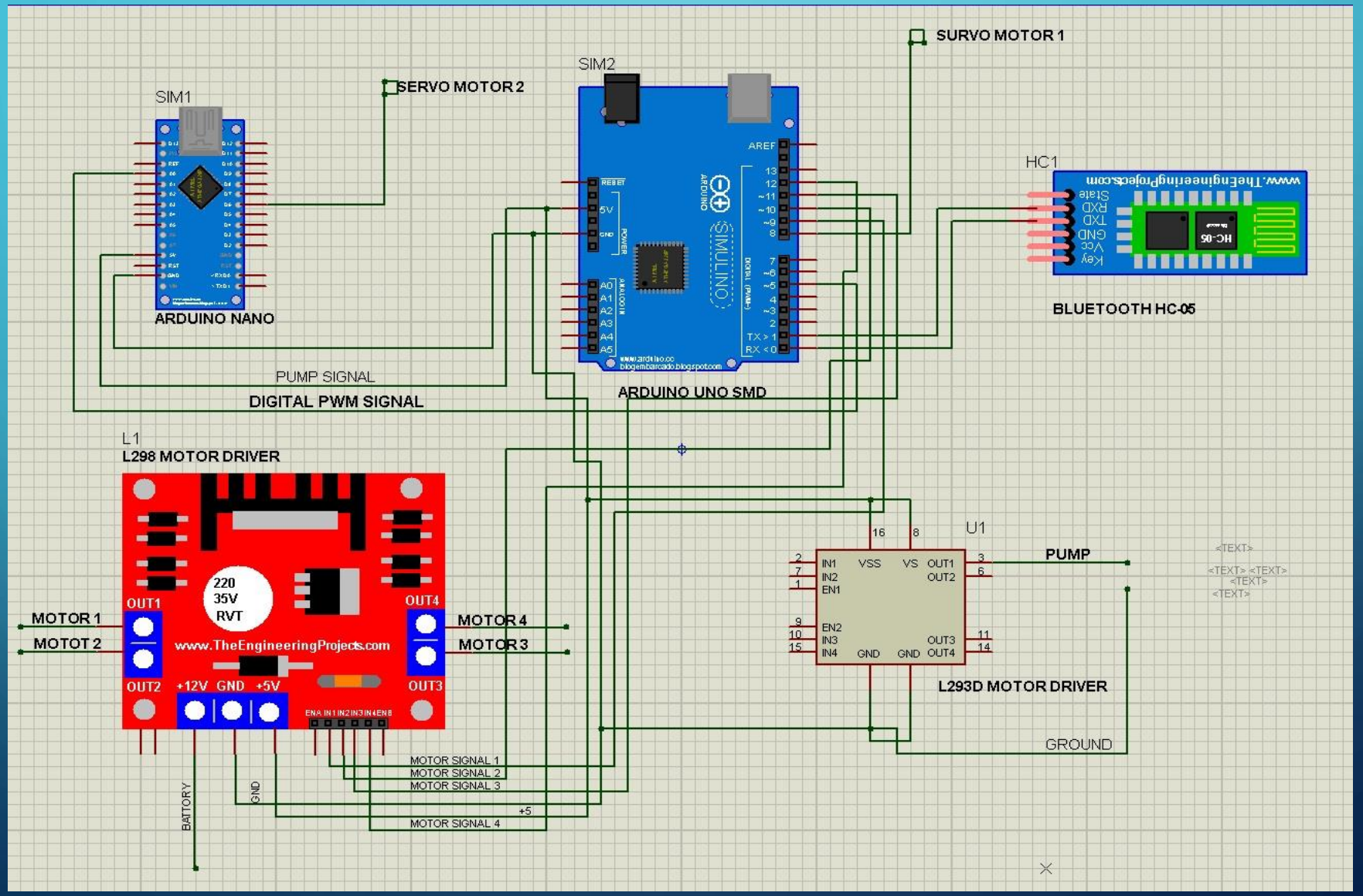
- The common disinfectants which are used in hospitals are rubbing alcohol and sanitizer, application of these liquids can be used to kill the virus immediately. Another way of doing this is by exposing the virus to the VU radiation as it is lethal to the virus
- The Robot uses rubbing alcohol or sanitizer as a disinfectant ,the small nozzle with small pump is used to create a spray of disinfectant. It covers maximum amount of area with the spray and the remaining area is treated with UV LED bulbs.
- The components of the project are as follows :-
  - Component 1:-

    The Robot uses servo nozzle and a liquid pump to pump sanitizer , the nozzle is connected to the arm of the servo motor which is controlled with Arduino It covers maximum amount of area.
  - Component 2:-

    The Robot uses UV LED to project LED light on the floor to disinfect it form the virus. The wavelength of the UV light is 207-222nm.which is harmless to human beings The Time required to kill the virus is approximately 30 minutes.
  - Component 3:-

    The Robot uses servo motor for the lid of the container to deliver medical equipments

DIAGRAM

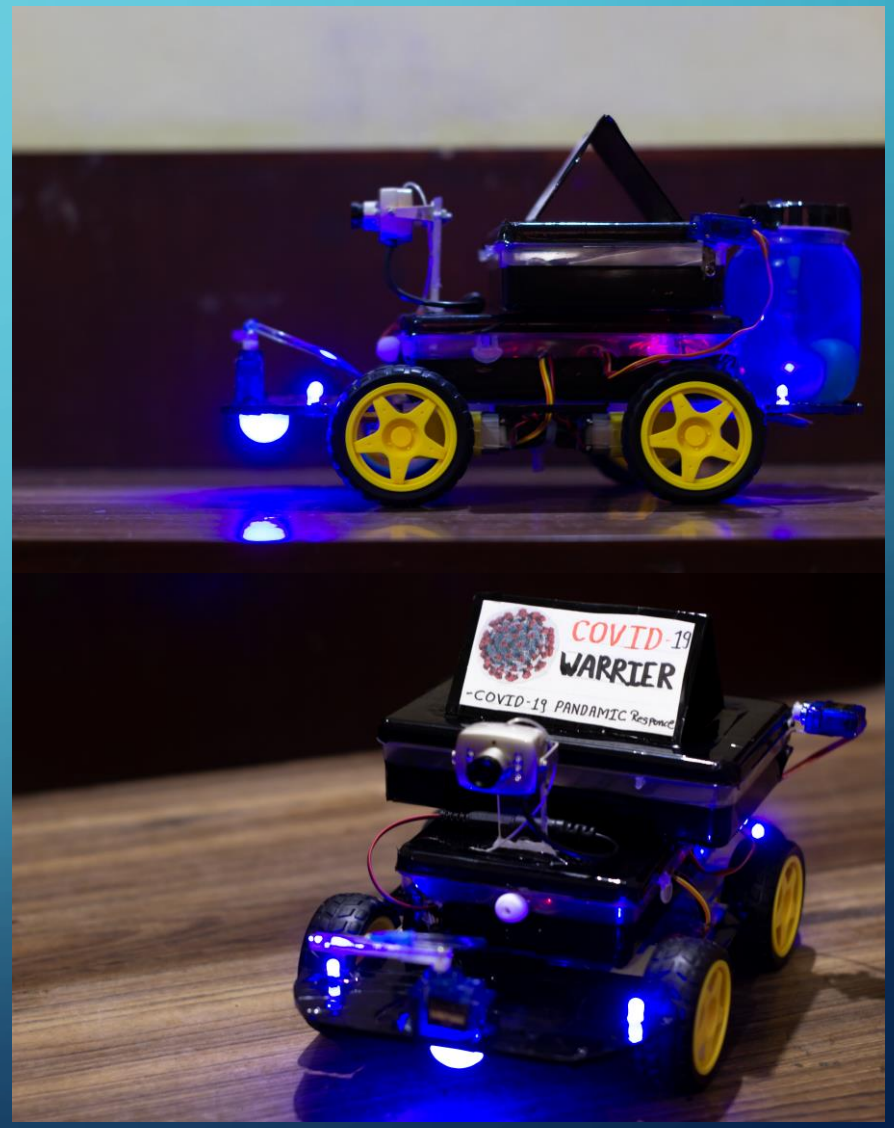

SIM1
ARDUINO NANO
SERVO MOTOR 2
SIM2
ARDUINO UNO SMD
SURVO MOTOR 1
HC1
BLUETOOTH HC-05
PUMP SIGNAL
DIGITAL PWM SIGNAL
L1
L298 MOTOR DRIVER
220
35V
RVT
www.TheEngineeringProjects.com
OUT1
OUT2
OUT3
OUT4
MOTOR 1
MOTOT 2
MOTOR 4
MOTOR 3
+12V GND +5V
U1
PUMP
L293D MOTOR DRIVER
GROUND
MOTOR SIGNAL 1
MOTOR SIGNAL 2
MOTOR SIGNAL 3
MOTOR SIGNAL 4
BATTORY
GND
+5

WORKING MECHANISM

1. The HC-05 Bluetooth modules should be paired with the mobile and the default
2. password to establish the connection would be 1234 or 0000
3. Then you need to click on “Select Device” option to select the paired Bluetooth module
4. When you press the “Up arrow” it sends the data “F” to the Bluetooth module connected with the boot and the microcontroller is programmed in such a way that whenever it receives the command “F” it moves forward
5. Similarly, when you press the “Down arrow” it sends the data “B” to the Bluetooth module connected with the boot and the microcontroller is programmed in such a way that whenever it receives the command “B” it moves reverse
6. And, when you press the “Left or Right arrow” it sends the data “L or R” respectively to the Bluetooth module connected with the boot and the controller is programmed in such a way that whenever it receives the command “L or R” it moves left or right accordingly
7. When the “Stop” button is pressed, it sends the data “S” to the Bluetooth module connected with the bot and the microcontroller is programmed in such a way that whenever it receives the command “S” the robot’s movement gets stopped
8. When front light button is pressed the “W” data is sent which turns on the UV LED and again pressing it will send “w” and it will turn off the UV LED.
9. When backlight button is pressed it will be used to turn on and off the servo motor connected to the nozzle.
10. Horn button is used to control the pump of the Disinfectant liquid.
11. Parking button is used to control the servo connected to the lid of the container on the robot

COST ESTIMATION & PHOTOES

Sr. No.	Component name	Quantity	Price
1	ARDUINO	1	650/-
2	HC 05 module	1	300/-
3	DC MOTOR	4	450/-
4	MOTOR DRIVER L298D	1	200/-
5	POWER BANK	1	700/-
6	WIRELESS CAMERA	1	2000/-
7	CHASSI ACRALIC	1	200/-
8	CHASSI CUTTING		100/-
9	MICROSWITCH	2	10/-
10	BURG STRIP	1	50/-
11	FOCOUS LED	2	5/-
12	LED	5	5/-
13	SERVO MOTOR	1	200/-
14	CONNECRING WITES	50Pic	50/-
15	WIRES	5MTR	20/-
16	WHEELS	4	100/-
17	USB CABLE	1	50/-
18	BRUSH	1	60/-
19	BOX FOR PROJECT	1	50/-
20	SMALL COMPONENTS	Zip locks, screw, Feviquick, lever	100/-



SOFTWARE AND HARDWARE REQUIREMENTS

- Software requirements:-
  - The Robot needs a RC robot controlling application which is used to control the robot link:- https://play.google.com/store/apps/details?id=braulio.calle.bluetoothRCcontroller&hl=en
  - Arduino IDE programming software. Link :- https://www.arduino.cc/en/Main/Software
- Hardware Requirements :-
  - Ardunio uno &nano Development boards.
  - L298D ,L293D motor Driver.
  - HC-05 Bluetooth module.
  - Servo motors.
  - DC geared motors
  - Water pump.
  - Wireless RF camera.
  - Lithium battery (18650x6/8.3V/10000mAh).
  - 18650 Battery charger.
  - Jumper Wires.
  - UV light LED.

FUTURE SCOPE & CONCLUSION

- Improving the robot by adding Raspberry pi to connect it to the server which extends the range of the robot
- Adding the raspberry to the server will be easier to control, manage and store and analyse the data received by the robot.
- Adding a GSM circuit to the Raspberry will add a important feature to the raspberry pi such as control over SIM.
- The power of the pump and spraying mechanism also can be changed to improve the disinfecting ability of the robot.
- Better quality camera can also be added to the robot to improve the visuals.
- The equipment carrying container also can be improved to increase the capacity.

-We have successfully created robot which can be used to perform various dangerous tasks inCOVID-19 wards. This robot can also be used to deliver the medical equipment in hospitals.