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Iot Based Military Surveillance & Fire Protection Robo Car

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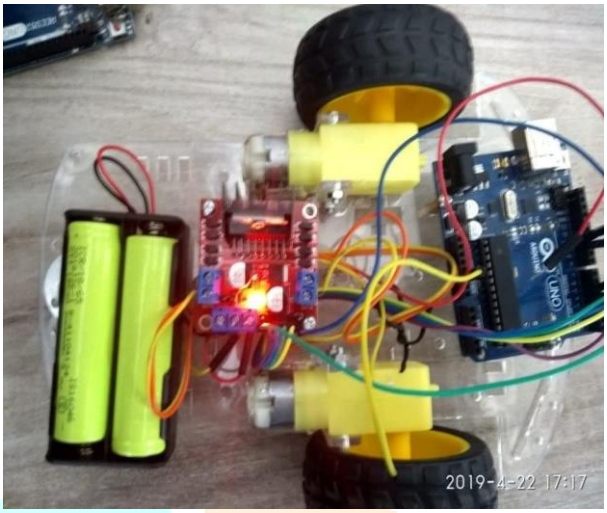
Abstract - In this project, we will learn how to make IOT BASED MILITARY SURVEILLANCE & FIRE SAFETY ROBO CAR by using ARDUINO. The ROBOTIC CAR can be controlled wirelessly by SMARTPHONE via BLUETOOTH. The smartphone has an android app through which the user can send commands directly to robot. The robo car can move forward, backward, left & right direction as well as we can stop the robo car by using the android app. The android's Bluetooth-controlled robo car is interfaced with a Bluetooth Module HC-05 or HC-06. We can give specific voice Commands to the robo car through an android app installed on the phone at the receiving side. A Bluetooth transreceiver module receives the commands and forwards them to the Arduino and thus the robotic car is controlled. The added feature in this project done by our group is that we are adding an IP based Neon Camera, Smoke Detector & Jet Spray with a tank. The added feature in this project will give us some salient features like 1. While the motion of this surveillance vehicle, it captures the real-time footage of the surrounding areas (24x7) which can be significant to track the intruder movements and hence the corrective actions can be promptly taken by the relevant agencies. 2. The surveillance vehicle has in-built fire detection system which the vehicle captures while in motion and subsequently sprays the water which hydrant as prima facie corrective actions to extinguish the fire and also send the images for calling more assistance. The important role in this project is played by a software app. The software app where we will be going to run for or to Control the robo car is ARDUINO BLUETOOTH CAR ROBO. This software can work only in smartphones. In this app there are 5 keys & they are Forward, backward, rightward and leftward buttons to give direction to the car as well as a stop button to stop the movement of the car.

I: INTRODUCTION

The project IOT BASED MILITARY SURVEILLANCE AND FIRE PROTECTION ROBO CAR also known as UNMANNED GROUND VEHICLE (UGV) is a car or is a vehicle which is going to be used for defence and fire protection purposes. This is a IOT based vehicle which going to be operated from an APP which is running through a SMARTPHONE. In that application there will be a remote which will help this robo car to move from one direction to other. This becomes possible because in robo car there is a Bluetooth connected and the name of the Bluetooth is HC-05. This Bluetooth will get connected to the smartphone and with the help of the app i.e. ARDUINO BLUETOOTH ROBO CAR app we can move the robo car from one direction top the other. Other than this there is a salient feature added in this projected and that is a NEON CAMERA, SMOKE DETECTOR & A JET SPRAY. This salient feature helps a lot in this project. Firstly, the neon camera. As we all know that by using neon camera, we can get clear visuals even at night which helps our MILITARY FORCES. They can have a look from neon camera that if an intruder is trying to cross the border and corrective actions can be taken on the spot. Secondly, the smoke detector and the jet spray. Taking the advantage of the application of the smoke detector we have decided to connect a smoke detector along with the relay which will trigger the pump and pump will generate pressure in the tank and water will come out from jet spray wherever the smoke detector detects the smoke and due to which this car will we very useful to extinguish fire. Thus, we can see that this project in not just an ordinary robo car, it also has the above salient features which makes this ordinary looking car mare special. Also because of its small size and less components used makes the care more cost efficient. It means, one will get cost efficient safety in this robo car. Earlier the IOT BASED MILLITARY SURVEILLANCE AND FIRE PROTECTION ROBO CAR was named as UNMANNED GROUND VEHICLE (UGV). It means the car is controlled without driver. But earlier the UGV used to run by the means of sensors, because of which car use to move unmanned but human does not have the control. This makes the UGV more dangerous and life threatening. The main intension was that the car should be unmanned but the car should be under the control of someone. So, from here the IOT comes into the picture. In 2011, Ernst Dickmanns (the pioneer of robo cars) invented IOT based robo cars. IOT based robo cars were very helpful. It was unmanned and also it can be controlled by someone from outside the car using smartphones. Thus, along with the property safety, this robo car eliminates the life threatening of living beings which was the main drawback of the UGV running on the sensors and which were not controlled by someone.

II: EXISTING SYSTEM

Earlier there was an unmanned ground vehicle in which there were no man to control the car but the car would run with the help of sensors. But the main requirement or main need was that thought the car would be unmanned but the control of the car should be there with someone who will be standing outside the car. After this Internet of Things (IOT) came into picture. IOT brought a great help to solve this problem. With the help of IOT, it became possible to introduce such car which would run unmanned but it will be under control of someone who is standing outside the car. So, a robo car was introduced. In that robo car there was Arduino uno, Arduino uno cable, L298 motor driver & DC geared motors were the main components.



Existing System

III: PROPOSED SYSTEM

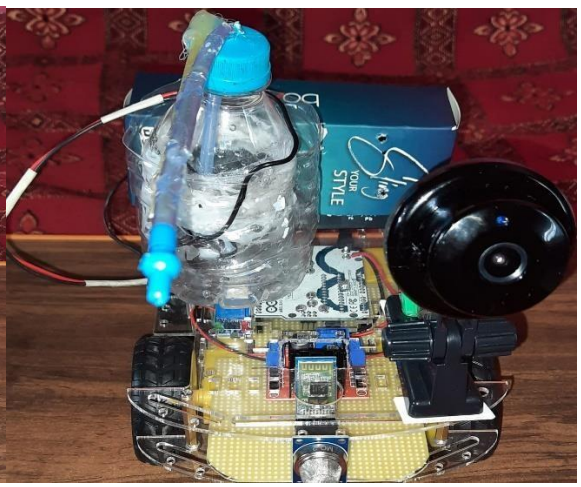
This project enhances this robo car with added features. The first added feature in this robo car is a neon camera or a night vision camera. With the help of neon camera one can see clear realtime footage even at the night. This will be very great help for the defence. They can keep an eye on the borders and if any false incidence happens like an intruder spot near the border corrective actions will be taken against those intruders. The second added feature in this robo car is the smoke detector and the jet spray and a pump as. If any public/private sector catches fire because of some reason. Then to extinguish fire this robo car will be very helpful. When the smoke detector detects the smoke of the fire, then the relay that is connected to the smoke detector will trigger the pump present in the tank and would create a pressure due to which water will come out of the jet spray. This will help to extinguish fire in a very short time span. Also, it will limit the major loss of life and property.

In IOT BASED ROBO CAR we have proposed 2 major solution and they are

1. Neon Camera
2. Smoke Detector Along with Relay & Jet Spray

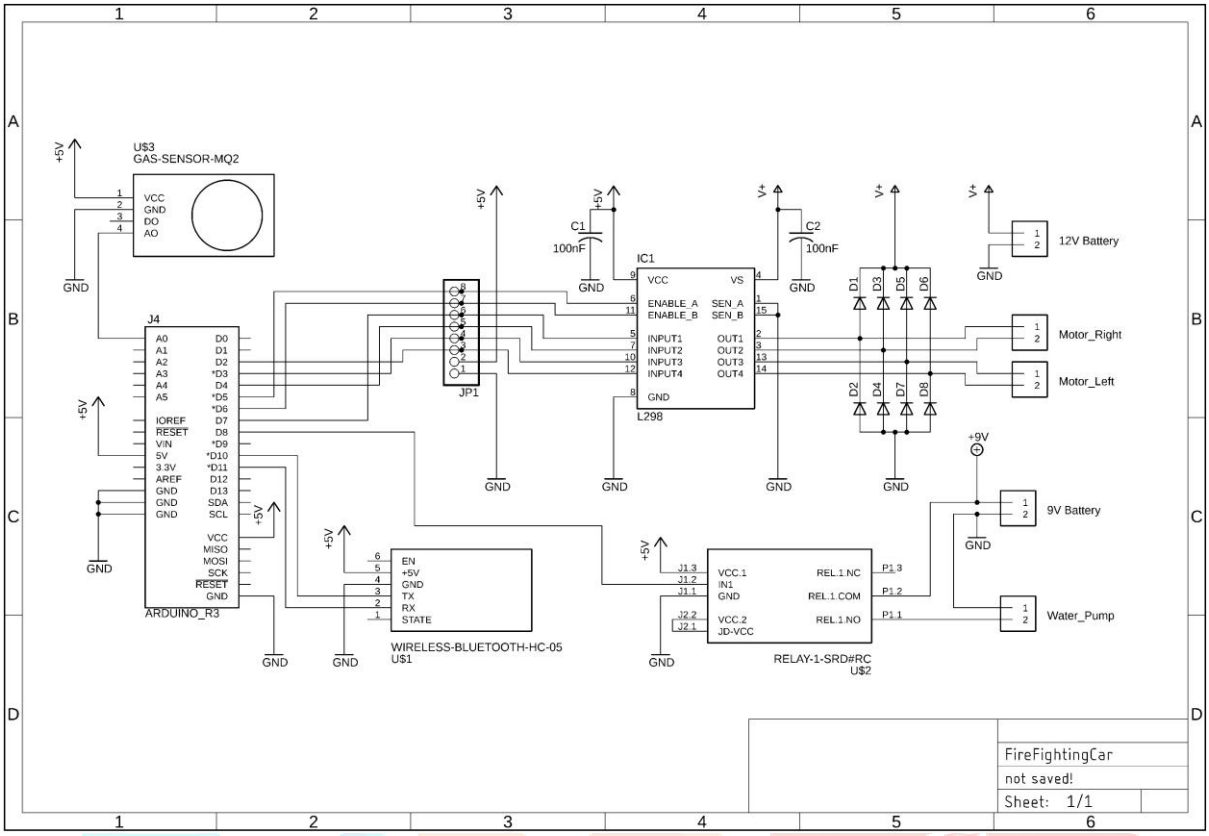
The benefit of these two major solutions are as follows

1. With the help of Neon Camera one can get clear pictures that what is happening in the night also. This advantage can be taken by the defense at borders to have a look on every movement at the borders, which results in if an intruder is spotted at the borders, corrective actions can be taken immediately by the defense people.
2. With the help of Smoke Detector & Jet Spray, we can easily extinguish the fire at a very short time span.



Proposed System

V: WORKING



Circuit Diagram

Above diagram is the circuit diagram of IOT Based Military Surveillance and Fire Protection Robo Car. After having a look on the above given circuit diagram, one can easily understands the working of the car. As we know that there is an Arduino is this car which act as a heart as well as the brain of this robo car. As soon as the programmer runs the program and the Arduino fetches the instruction and starts works. It gives signals to the Bluetooth and L298 Motor Driver as well as Smoke Detector. Then the Bluetooth terminal gets on and starts giving the signals through which we can pair and connect the Bluetooth module to our Mobile Phone. Secondly, the L298 Motor Driver gets the signal from Arduino and it gives the signal to DC Geared Motors. The control of DC Geared Motors is in the hands of L298 Motor Driver. Third Signal goes to smoke detector which is located in the front of the car. As soon as the smoke detector detects the smoke the relay fixed in it give trigger pulses to the pump kept in the tank. After getting trigger pulses, the pump creates a pressure in the tank and sucks the water and throws the water from the pipe and the nozzle attached to the pipe is attached such that it the flow of the water has high speed as compared to the jet spray. Another thing attached to the car is the Neon Camera. It is not connected with the Arduino. It has different supply. As, it is a IP based Neon camera so we can say that we can connect the camera through same Mobile Device through which we are controlling the robo car. IP based camera can be connected through WiFi. So, we can control our car and can see the real time visuals at the same time in the same device. Due to this, only one hand of the operator will be engaged and another hand would be free. Also, the operator can concentrate easily and more conveniently in one device rather than getting irritated by two devices. So basically, this is the working of the robo car.

V: Literature Survey

We have seen surveillance and fire protection robo car in this project. In this project there is a neon camera, smoke detector and a jet spray. With all this added advantage in this robo car, this robo car has become beneficial for our armed forces specially at borders. This helps the armed forces to keep an eye on every action happening at the border and to keep an eye if an intruder tries to cross the border, so that corrective actions would be taken on the spot. Another feature in this is, if fire catches in any public/private sector then this robo car will detect the smoke of the fire with the help of smoke detector and will trigger the pump with the help of relay connected in the smoke detector and pump will create pressure and jet spray will splash the water and we can extinguish the fire in a very short time span. Because of this additional feature in this robo car, we can limit the major loss of life and property. In short, this robo car is very helpful inside the country as well as at the borders of the country. Earlier a work has been done on this robo car. Previously there was a simple unmanned ground vehicle, in which a car was running unmanned with the help of sensors because of which car as running unmanned but it was not in a control of someone. For defence purpose the main need was that the car should be unmanned but the car should be in control with someone. So, from there IOT came into picture. With the help of IOT, it became possible that the car would be unmanned but it should be controlled by someone by the means of smartphone. So various apps have been created and by the means of Bluetooth this robo car was controlled through smartphones. This was a great invention and solved many problems.

VI: RESULT

The final result of the project is that the connection of the robo car has been done and checked again. This completes the checking of construction part of the project. As mentioned, we had checked the working of the robo car twice and is working properly. This completes the checking of working part of the project. So, after checking both the mentioned point, the result of the project is that the model of the robo car is ready and is in working Condition.

VII: CONCLUSION

After completing the construction of the prototype of the robo car, we finally reached to the conclusion that the robo car is in working condition and the construction of the robo car is been successfully done. Also, we have noted the point that if this car comes in the market along with its salient features, it will not damage any life and property in public/private sector. It is a risk free and controllable car whose motive is to do surveillance and extinguish fire. Thus, finally we reached to this conclusion.

VIII: FUTURE SCOPE

This project has a bright scope in future. This car can be used in public as well as private sector and along with that as the name suggests it can be used by the Military and other defense sectors for surveillance as well as extinguishing the fire cause due to explosion during war near borders

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