International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 07 | July 2020 www.irjet.net p-ISSN: 2395-0072

Military Surveillance Robot

Abhijeet Dhule[1], Neha Sangle[2], Supriya Nagarkar[3], Asmita Namjoshi[4]

[1]Student, Dept. of Computer Science, Tilak Maharashtra Vidyapeeth, Pune, Maharashtra
[2]Student, Dept. of Computer Science, Tilak Maharashtra Vidyapeeth, Pune, Maharashtra
[3]Professor, Dept. of Computer Science, Tilak Maharashtra Vidyapeeth, Pune, Maharashtra
[4]HOD, Dept. of Computer Science, Tilak Maharashtra Vidyapeeth, Pune, Maharashtra

---

Abstract - *Surveillance plays an important role in border areas to keep eye on enemies. In such situations it is difficult to allow duty of surveillance to a soldier, which may cause dangerous to the life on one. Rather we can use an robot to keep eye on border areas. So in such cases this kind of robots are very useful they are small in size and provided with many abilities so they can perform the duty of surveillance and spying perfectly. In case if they found by the combatant, they have no identity to whom they belong. Military on border area are facing many problems so this kind of technology help them to aware about the opponent activities, so they can take further decisions.*

Key Words: **Military, Surveillance, ArduinoUNO, Camera, Robot**

1. INTRODUCTION

Indian Border has been facing many attacks from the foes ,which cause lot of financial as well as mental & physical crisis. With consideration of such critical conditions we developed and surveillance robot specially for military purposes. The main component of the system is Arduino, it is a micro-controller ,which perform all the processes of system. We can use this kind of technologies in the border area to keep tracking all the activities of opponent. This robot is provided with abilities like camera, mechanical Arm, IR sensors. Which help in the task of spying as well as a general purpose of military. Spying and surveillance is a crucial task, we cannot put someone life to risk, instead of that we can use this kind of robots which do not need sleep, they don't get hungry, they don't have emotions, they are just stick to their duties and follow the orders. Nothing can be more important than human life. Use of such robots can help to save many lives on border areas. And we can use this manpower in other tasks. Here we use an android app to control the robot. this app connect to the micro-controller using wifi or Bluetooth. The base part of robot consist of wheels, so they can travel on rough & watery surfaces too. The arm is located just above the base which can help in picking up the object, hold it, drop it. The arm can move in 360 degree, providing better ability to the machine. The IR sensor avoid collision of the robot to unwanted obstacles. The camera module stream the live footage of the scene over wifi to the receiver screen. So the one who is sitting on the output screen can have all the records of opponent activities. This kind of robots can easily replace the soldiers and perform the duty with better modifications. So in the future the warfare are handled by this kind of smart robots. Which minimize the life threats during wars.

2. METHODLOGY

This project is based on a micro-controller and IOT concepts. Where we are using Arduino , Servo motors, car chassis, camera module, sensors and mechanical arm to build this surveillance robot setup. The camera which we used to stram the video over wifi use the internet and provide us a live feed and the amazing part is here that we cane control the whole setup from an android app. So for this we build an android application using android studio, the app has controls like forward, backward, turn left, turn right. And same for the Arm. The Arduino uses C language for coding. The data capture through camera module, send to the desired device using internet. By using this data the user gives further commands to the robot.

3. HARDWARE SPECIFICATION

A)Arduino UNO:

Arduino uno is a micro-controller. It is base on a Microchip ATmega328P. It is developed by Arduino.cc. The chipset has set of digital and analog I/O pins, which is used to interface with various other boards and circuits. The board has 14 digital and 6 analog I/O pins. Arduino IDE is used to program this module. The microchip comes preprogrammed with a bootloader, so we don't need any external hardware programmer to upload the code.

Here we use this module to handle all the processes of the robot. It work as a brain for whole system. By using app and

Bluetooth module interface we can manage the actions performed by robot.

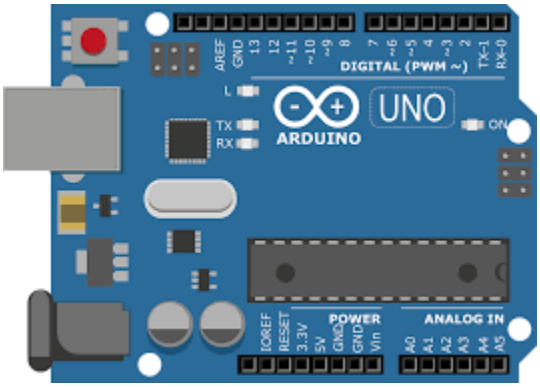

Fig -1: Arduino UNO Board.

B) Servo Motors:

A servo motor is a type of motor, which provide precise actions and rotations. With using gears which helps the shaft to rotate in precise maner. It provide precise control of angular position and acceleration. It requires a dedicated module to control the actions. In this project we use the servo motor to provide the precise control of arm. We also used the DC motors for the wheels. So it can rotate at required speed and provide good speed to the robot.

Fig -1: Servo Motors.

C) PIR Sensor:

PIR stand for Passive Infrared Sensor, it is a electronic sensor light radiating from object in its field of view. This kind of sensors are highly sensitive and mostly use in motion detectors. Applications of PIR sensors are Security alarms and automated lighting applications. It detects motion in the surrounding and send the coordinates back to the output screen. PIR sensor do not emit radiation for detection purpose, they detect radiant heat from objects in surrounding

Here we use this sensor to avoid collision of robot to unwanted obstacles, also for future use we can use this sensor ad radar to detect objects in the territory.

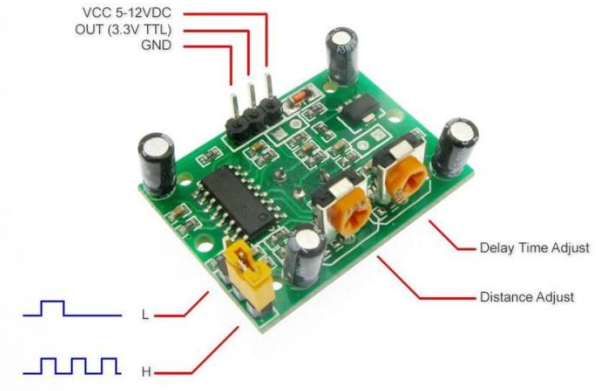

Fig -3: PIR Sensor.

D) Robotic Arm:

Robotic arm is a mechanical arm inspired by human arm. It is programmable and can be control as per user requirements. It perform similar functions like human hand. this kind of robotic arm required high accuracy servo motors to work precisely. There are multiple joints in the arm which make movements using the servo motors and perform the task.

The robotic arm we used in this system is a combinations of servo motors and 3D printed plastic parts. (like base, claw). This arm can move in 360 degree to give and provide accurate functionality.

Fig -4: Robotic Arm.

D) Camera Module:

Camera module is a wifi camera, which is capable of doing live stream to the output screen. This kind of camera connects to the internet over wifi and after that it generate an IP address where we can actually see the live feed by camera. This camera covers the activities in its field and display it to the user. This type of technique can be better in some cases than human eye, we can record all the activities by the opponent, hence we have proof of all of its activities . this camera is connected to the Arduino and controlled by the android app. The servo motor is connected to this camera so it can rotate easily.

Fig -5: Camera Module.

D) HC-05 Bluetooth Module:

it is a Bluetooth device which use to communicate wirelessly over Bluetooth. It connect to the all Bluetooth enabled devices. It connect to the arduino board via serial communication. AT commands are used to modify the setting of module. in this system we use this module to establish the connection between mobile app and micro-controller. By using this module, all the commands that we used in app and communicate to the arduino and according to that it perform all his task. We use Bluetooth 5.0 technology which having better connectivity and range

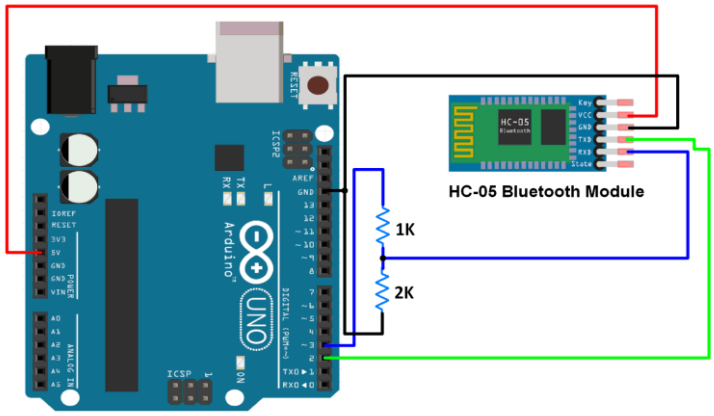

Fig -6: Interfacing HC-05 Bluetooth Module with Arduino UNO

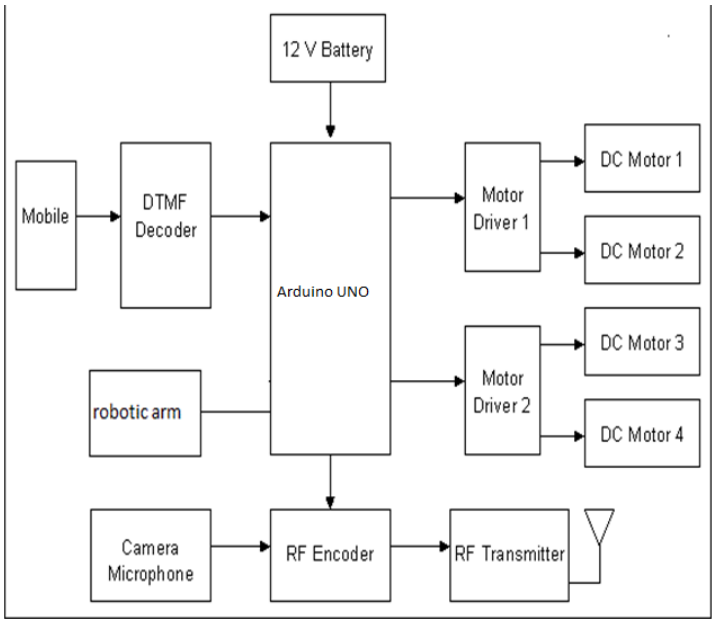

Fig -6: Block Diagram for the system

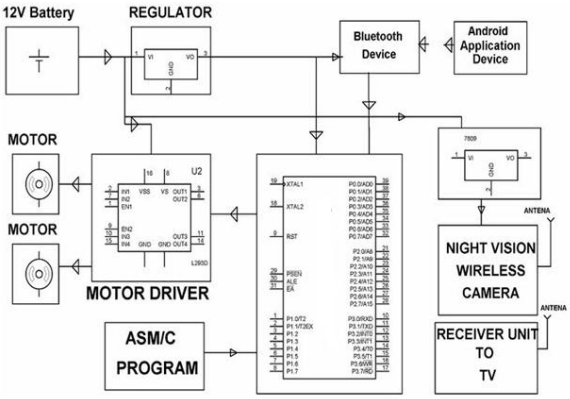

Fig -7: Circuit Diagram for the system

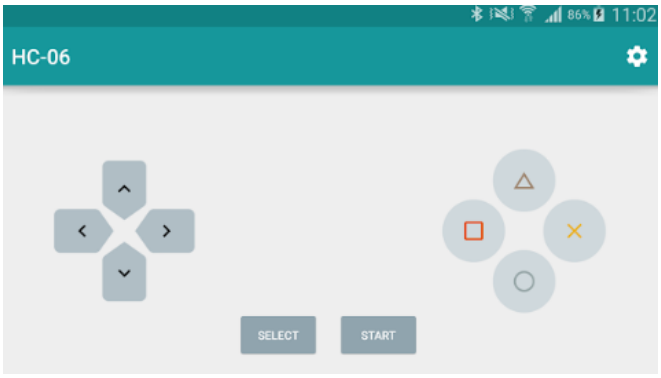

Fig -8: android app to control.

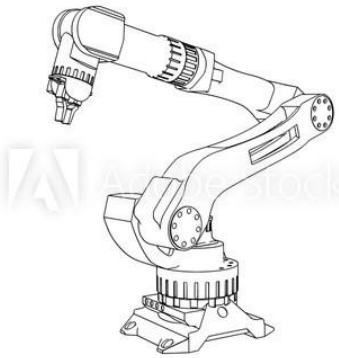

Fig -9: Prototype Model for Robotic Arm.

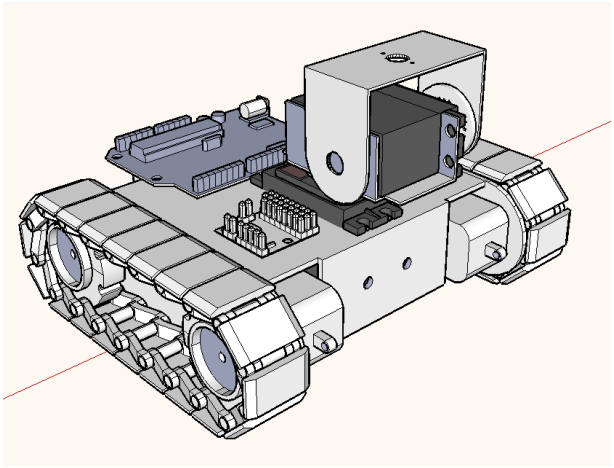

Fig -10: Prototype Model for Robot base structure.

4. CONCLUSIONS

This kind of smart robots are the future technology used in military. By using such robot we can minimize the threat to the life. And save as much as possible human power, which we can consume somewhere else.

In this project we developed an smart robot for military applications which provide us surveillance on border area. We can know the real time condition there and act further according to that.

5. FUTURE SCOPE

Our future aim is to concentrate on use of AI(Artificial Intelligence) and machine learning so it can take minute decisions of its own. Also we are considering to use an laser gun, for its protection and sometimes to target the opponent.

6. ACKNOWLEDGEMENT

With immense please we are presenting “Military Surveillance Robot” Project report as part of the curriculum of ‘Bachelor of Computer Application’. We wish to thank all the people who gave us unending support. We express our profound thanks to our head of department Mrs. Asmita Namjoshi., project guide and project incharge Mrs. Supriya Nagarkar and all those who have indirectly guided and helped us in preparation of this project.

7. REFERENCES

[1] Jain, Khushwant, and Vemu Su Smart Robot Car for Border Computer Applications76, no. 7,

[2] Mohammad, Tarek. "Using ultra measurement." World Academ Technology 51 (2009): 293-299.

[3] Binoy, B. Nair, Abhinav Kaush Rathnaa Barani, and Aswathy Unmanned Ground Vehicle." I Communication Technologies Conference on, pp. 356-361.

[4] Harindravel, Letchumanan. "Mo GPS Tracking." (2013).

[5] Arroyo, A. Antonio. "Autonomo Vehicle."

[6] Maurya, Mridula, and Shri RN S (Motes): Performance metrics an Advanced Research in Electronic (2013): pp-045.

www.google.com
www.arduino.cc
en.wikipedia.org
www.researchgate.net

8. BIOGRAPHIES

1)Abhijeet Suresh Dhule, Student at Tilak Maharashtra Vidyapeeth, Pune. Department of Computer Science.

2)Neha Shirish Sangle, Student at Tilak Maharashtra Vidyapeeth, Pune. Department of Computer Science

3)Asmita Namjoshi, HOD of Dept. of Computer Science.
Tilak Maharashtra Vidyapeeth, Pune.

4)Supriya Nagarkar, Professor at Tilak Maharashtra Vidyapeeth, Pune. Department of Computer Science