

# Smart E-Soldier For Military Application By using IOT

ISSN 2395-1621

Pratik Ravkhande, Madhav Pawar, Aniket Tarte, Dr S.B Dhonde



madhavpawar432@gmail.com  
pratik.ravkhande12@gmail.com  
aniketarate4569@gmail.com  
dhondesomnath@gmail.com

Department of Electronics & Telecommunication  
Engineering, AISSMS Institute of Information  
Technology, Pune.

## ABSTRACT

The robot is actually electro-mechanical device which is controlled by Mobile App with electronic circuit to perform variety of physical task. As Technology improving day by day therefore scientist come up with new ideas and inventions. In today's world robot are becoming essential part of human life. This technology also used in Defense forces, complicated area operation, Space exploration. As we know world is always trapped by terrorist attack so, the robots are going to use for saving human life. The main goal behind developing this robot is to Protect Soldiers in complicated area operation where soldiers are unable to perform operation. This system will be combination of remote operated machine gun and control application. In this paper we are Improving border Security by using smart e-soldier. The E-soldier Consist of 360 Degrees rotating Night vision camera. Machine gun is on the Rover and it will be controlled by mobile app, Further it will operate in Wide Range with the Help of IOT. **Keywords—** Night Vision Camera, Machine Gun, Mobile App, Wi-Fi Module.

## ARTICLE INFO

### Article History

Received: 8<sup>th</sup> March 2020

Received in revised form :

8<sup>th</sup> March 2020Accepted: 10<sup>th</sup> March 2020

### Published online :

11<sup>th</sup> March 2020

## I. INTRODUCTION

Now a day's world facing problem of terrorist attacks so, the robots are going to use for saving human life. Countries like India are still facing threats from terrors. Both Kashmir and Mumbai terror attacks have accomplished that as long as possible the future of warfare will be managed by robot and unmanned rover to protect human life.

The technology grow rapidly in automation field by consolidate Military Robots as Soldiers in war field to reduce grievance and demise in war fields.

The aim of this paper is to build the system which will provide the security on border and protect the soldier life. The system will be combination of remote operated machine gun and control room. In this paper we will build wireless defensive machine gun which take decision as per defined by the user.

We are using internet of things (IOT) to operate the smart e-soldier from anywhere of the world. That E-soldier Consist of 360 Degrees rotating Night vision camera.

Machine gun will be controlled by mobile app. For operating Smart E-Soldier through internet, we are using ESP8266 Wi-Fi Module, which is also use to connect 360 degrees Wireless Night Vision Camera.

## II. LITERATURE SURVEY

An approach is presented, that provides Technology used here for serial communication with the robot is the Bluetooth technology. Bluetooth technology can be used to share data between two devices considering the range between two devices. The Bluetooth module HC-05 will be connected with the robot and the commands to the robot will be given through the android application. The war field robot consists of Arduino UNO board as a controller board. It has L293D motor driver IC's along with a HC-05 Bluetooth module. Two DC motors are also used for the motion of the robot. The night vision wireless camera is attached with the robot in order to monitor the situation and the camera can be rotated 360 degrees via the android application through motor [1]. Limitation of this system is that the Bluetooth Module has Limited Range, therefore wi-fi Module can be used.

The machines are built to completely eliminate its target from far distance without any harm to the soldiers. One of its kinds is the robot gun built by the South Korean company. This robot gun was introduced in the Korean robot world 2010 expo named as Super Aegis F2. This robot gun was manufactured by the South Korean

company named as DODAMM. This robot gun is capable to do a lot of things for military use. It is equipped with 12.5m machine gun with grenade launcher built in it. It also consists of a 30x zoom CCD camera on it. This camera is used for surveillance. Also it has laser range finder to predict the range of the particular object or a human and also consist of infrared sensors to detect the presence of human beings also it is having ability to shoot in 360 degree. Ability of this is such that it can shoot up to 3km away target in day time and can shoot up to 2.2km in the night darkness with the help of CCD camera [2]. The Proposed system uses RF Technology which has Limited Range up to 3Km. To overcome this Limitation we used IOT Technology for unlimited range.

To develop an automatic sniper through wireless operation, as per the name suggest, initially we detect the stationary targets and gun will be controlled by the operator to locate the actual target. Sniper will move in Upward, Downward, right and left direction according to the requirement. For detection we use webcam on sniper that shows actual on field video streaming on monitor at control unit. This advanced feature we have used in our system for providing reliability to operator while operating [3].

This paper has presented an autonomous moving robot which is capable to detect a certain object, approaches towards its target and shoot it down. The main constraint of this approach is that it can shoot only static .So our future work is to make an autonomous system which could predict the direction of moving targets using object tracking [4]. So the limitation of this system is that it can shoot only static object. To overcome this Limitation we used moving Gun in upward, backward direction to shoot moving objects.

### III.SPECIFICATIONS OF THE SYSTEM

As the system is totally based on IOT, The functionality of the system is start with the establish connection between robot and user application to the cloud through the Wi-Fi module. The wi-fi module is connected to the internet through hotspot created locally. After the wi-fi module is connected to internet the wireless camera will start giving real time surveillance which is stored on cloud. Then user will access the robot through mobile application. The mobile application is design in such way that it controls all movements and also firing mechanism of the robot.

#### System interfaces input and output

The system includes following interfaces

- Mobile application: - Interface towards user.
- Cloud: - Interfaces between robot and user.
- Wi-Fi: - Interface to the robot.

#### System Requirement

- Hardware Requirement
  - Chasse

- Machine gun
  - DC-motor
  - Servo-motor
  - Wireless night vision camera
- Software requirement
    - Arduino Software ( IDE )
    - Remote XY (app builder)

### IV.SOFTWARE DESIGN

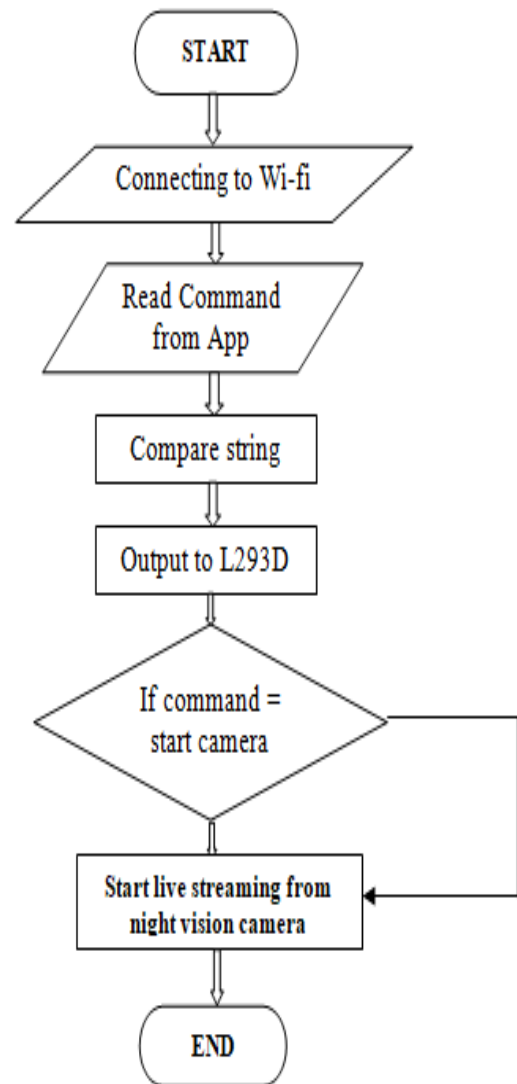


Fig.1 Flow Chart

### V. HARDWARE DESIGN

#### A. Motor Interfacing

The four DC motors are connected to L293D IC with the help of internal H-bridge structure through pins 3 and 6 and other with pins 11 and 14. The input pins are connected to the Arduino board. The Diagram shown below is the Proteus implementation of connection of Arduino with L923D.

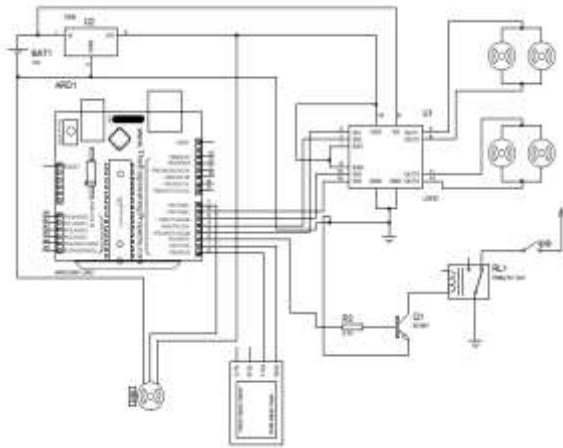


Fig.2 MOTOR-ARDUINO INFACING

**B. Night Vision Wireless Camera**

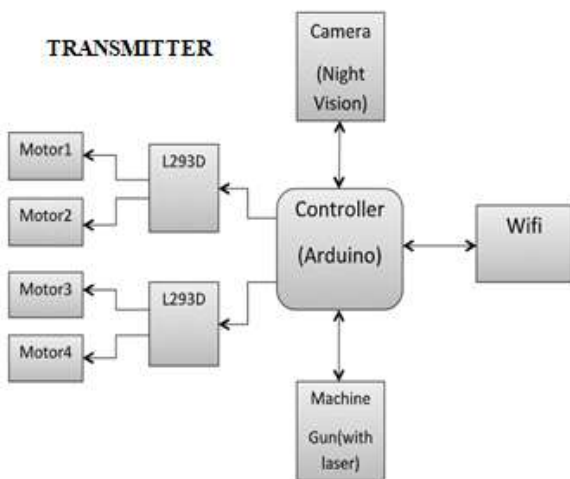


Fig.3 night vision camera

➤ **Wireless Camera**

- Motion detection.
- Imaging Sensor 1/4Inch-CMOS.
- Min Illumination:1.7lux
- View angle:69Degree
- Camera weight: 19gm.

**VI.METHODOLOGY**



**RECEIVER**



Fig.4 Block Diagram

- The robot made move in the field with a set of four wheels.
- The night vision camera attached to the robot captures real time surveillance of the enemies from the war field.
- The real time surveillance obtained from the camera is send to the cloud through wi-fi module.
- At the receiver station the surveillance from cloud is display on screen.
- With the help Control keys on mobile app we can control movement as well as firing mechanism of the robot.

**WORKING OF SYSTEM**

The robot is made to move in the war field with a set of four wheels. Also the night vision camera attached to the robot captures real time surveillance of the enemies from the war field this real time surveillance obtained from the camera is send to the cloud through wi-fi module and at the receiver station the surveillance from cloud is display on screen and With the help of Control keys on mobile app we can control movement as well as firing mechanism of the robot.

**ALGORITHM**

1. Start
2. Wi-Fi connection will be established.
3. Commands (forward reverse, right and left) from the android phone will be sent to Arduino UNO
4. Arduino UNO checks commands and give signals to L293D motor driver
5. When start camera command is received to Arduino UNO from app it will start live streaming from the Night Vision camera interfaced with it
6. Servomotor can move camera angle as per the commands received from app by Arduino UNO
7. Stop

**VII.FUTURE SCOPE**

The proposed system can be enhanced to implement the bomb diffuser unit along with machine gun unit this system can be enhancing by using different controller which is more powerful than present one.

System can be enhancing to have artificial intelligence, which is capable to design fully automatic system also this system can be further implemented by using face recognition unit which is more useful on war-field where enemies can uses same clothes as of own army.

### VIII. CONCLUSION

The robotic rover works as automatic rover and also Manually Controlled rover using this robotic vehicle has ability to replace the soldier at LOC areas where provide Automatic internet as communication medium. This robot is used to give real time surveillance of war field areas. Conventionally, this wireless robot has unlimited Frequency Range. Thus we overcome the limitation of Bluetooth Technology by using Internet of Things (IOT). Camera captures the live surveillance from actual war field and transmits it to the mobile unit over the cloud. As soon as target is detected operator can set the position of gun and hit the target with the help of GUI buttons.

### REFERENCES

- [1] Jignesh Patoliya, Haard Mehta, Hitesh Patel "Arduino Controlled War Field Spy Robot using Night Vision Wireless Camera and Android Application" V. T. Patel Department of Electronics and Communication Engineering Charotar University of Science and Technology, Changa, Anand, Gujarat: 388421, India.
- [2] Sachin Joshi, Sandeep Nelwade "A Wireless Portable, Self -Defensive Machine Gun" S.S.I.Engineering and Management Parbhani India.
- [3] Bhushan Bhomble, Sheetal Katkar, Dhanashri Dhere, Gajanand Arage, Samreen Bagwan "IoT based Smart Sniper" E &TC Dept, Rajarambapu Institute of Technology, Rajaramnagar, Sangli.
- [4]Munmun Das, Mayur Khairnar, Pavan Bansode "IOT Based Border Security with Automatic Gun Actuation Using Motion Tracking System". P.G. Moze College of Engineering, Wagholi, Pune.