

## **SOLDIER ROBOT**

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### **ABSTRACT**

The main purpose behind developing this robot is for the surveillance of human activities in the war field or border regions in order to decrease infiltrations from the enemy side. The robot consists of night visualization wireless camera which can transmit videos of the war field in order to prevent any harm and loss to human life. Military people have a enormous risk on their lives while entering an unknown territory. The robot will serve as an suitable machine for the defense sector to reduce the loss of human life and will also prevent illegal activities. The robot will help all the military people and armed forces to know the condition of the territory before entering it.

**Keyword:** AVR Atmega 328, Zigbee, DC Motor, RGB Colour Sensor

### **I INTRODUCTION**

Now military robots are considered to be the future of modern war- fare. At the same time, military robotics is measured to be the game-changing technology that could change the structure and employment of armed militaries. Society is aware of the military employment of robots today. The question is why we witness the massive use of military robotics only during the last decade. What factors determine such a development? Is this progress a common trending all armies or just some of them? What advantages can we gain by employing the military robots on the battlefield? The problems above may be answered by implementing the economic theory in the area of military robotics. The military robotics is the application of robotics in the military, such as remotely piloted vehicles operating on the ground, in the air or under water, automated missiles and supply handling devices. Thus, the commercial theory of military robotics is essentially the application of economic values and analysis to the area of military robotics and the text below provides a partial insight into this subject matter.

### **II LIMITATION OF CURRENT SOLDIER ROBOT :**

- Lack of new technology and extra feature such as camera ,metal detection, gas detection, it acquire colour depends on surrounding condition
- Lack of stability and less processing speed
- Robots will no longer be controlled by humans and human armies will be no longer as important

### **III LITERATURE SURVEY**

[1] This paper presents Service robots directly interact with people, so finding a more natural and easy user interface is of fundamental importance. While earlier works have focused primarily on issues such as manipulation and navigation in the environment, few robotic systems are used with user friendly interfaces that possess the ability to control the robot by natural means. To facilitate a feasible solution to this requirement, we have implemented a system through which the user can give commands to a wireless robot using gestures. Through this method, the user can control or navigate the robot by using gestures of his/her palm, thereby interacting with the robotics system. The command signals are generated from these gestures using image processing. These signals are then passed to the robot to navigate it in the specified directions.

[2] This paper proposed multi-use robot rover is specially met for the patents having various disabilities to help them to take their own food and medicines without the help from others. The robot rover contain a miniature robotic hand for pick and place the medicines, food and items for the persons. The controlling of this rover can be done by the patient or an external person according to its disabilities. The main controlling techniques that included are voice controlling and a joystick controlling. Also this rover is helpful for sensing the presence of flammable gas, humidity, temperature, and flame and an obstacle detectors for remote sensing applications in military and for helping the patients. All monitoring data's will be displayed and controlling will be done in wireless remote equipment and it have a practical range of about 750 meters. The LCD character display in remote will displays the sensing contents in real-time manner. The voice analyzing and controlling is done by an EasyVR present in remote controller [3] We propose a cost-effective four-wheeled surveillance robot using an Arduino UNO microcontroller and a smartphone running the Android Operating System. Surveillance robots typically consist of a video camera, a GPS module, and GSM radios. Android smartphones come with excellent hardware satisfying the above needs. This can be leveraged and used to advantage through APIs (Application Programming Interfaces) provided for the Android operating system. Moreover, the cost for building said robot using a smartphone is mitigated to a great extent. The robot can be controlled remotely from a PC using the internet and a microcontroller-smart phone interface residing on the robot. To capture and archive the real time video from the robot, the inbuilt camera input of the phone is utilized. The robot can be controlled based on visual feedback from the same smart phone. Four motors help achieve a zero turning radius. The camera is attached to a stepper motor which makes it feasible to capture the scene or object of interest. The captured video can be enhanced and made intelligible using further image processing on the remote PC thereby eliminating the need for extra DSP hardware on the robot.

[4] We have built a four wheeled robot with an Arduino microcontroller, specifically the Arduino Mega 2650. We have written Arduino and Android libraries to allow an Android device to control the robot through a USB connection. The robot is designed to track objects by spinning left and right to keep the object in sight and driving forward and backward to maintain a constant distance between the robot and the object. Images are acquired through the camera of an Android device which is attached to the robot. The camera is attached to servos on the robot which allow the camera to pan and tilt. Several image processing techniques are used to

detect the location of the object being tracked in the images. Two different kernel based trackers are implemented as Android applications. One of them uses a color based tracking method and the other uses a template based tracking method. Both applications use Android's Open CV library to help with the image processing. The experimental results of the robot using both methods show robust tracking of a variety of objects undergoing significant appearance changes, with a low computational complexity.

[5] Spy robots are remotely controlled robots, equipped with a camera, transmitting video data to the intervention troop. They are made to small and compact enough to easily transport. In this paper, the project supposes a movable spy robot with a remote controller by using PIC 16F628A and PIC 16F877. The spy robot is made up of a wireless camera, an antenna, batteries and four movable wheels. The two different PICs are used to remotely control along wireless system and to control Spy robot. CCD camera is used to capture information surrounding the robot. A 4 bits LCD display is mounted on remote controller to view user command. To use the Spy robot in the dark area as night, the CCD is set up with LED that connected by lighting circuit. Radio Frequency modules signals are used in wireless remote control system for transmitting and receiving wireless logic signals to control the motors of the Spy robot control system. The three Brush DC motors and the two L298N are involved in Remote Operated Spy Robot. L298N are used to drive the Brush DC motors respectively. In this paper, Remote Operated Spy Robot is a small robot designed for spying, surveillances and inspection purposes.

[6] In the world of photography, surveillance of larger areas and military operations, the immediate machines that accommodate the Unmanned Aerial Vehicle (UAV) category are the autonomous aeroplane and helicopter. Helicopters have clear advantages over the aeroplanes. They can be able to hover and land/take off in limited spaces. The quad rotor is a helicopter that has four rotors which are fixed to a certain spin axis. The different spinning directions of the motors balance the torques on their associated axes, therefore eliminating the need for a tail rotor that a normal helicopter requires. As long as all four rotors rotate at the same speed, the quad rotor helicopter essentially hovers, this proving to be a less complex in mechanical structure. Researches are being done to improve the reliability and decrease the size of such vehicles. So, they can be used in Search and Rescue operations, surveillance, inspection, aerial photography and aerial mapping.

#### **IV PROPOSED SYSTEM OF SOLDIER ROBOT**

Nowadays, with the growth of technology, several robots with very special integrated systems are particularly employed for such risky jobs to do the work diligently and precisely. This is intended to give related information about such military robots and their working abilities and efficiencies.

The main aim of the project is to design robot which has better range and camouflaging feature. Provide better stability and higher processing speed and it help to acquire colour of surrounding

#### **V OBJECTIVES OF PROPOSED SYSTEM**

- To make system automated

- Replace the manual efforts with machine mechanism.
- The aim of redesigning the model is to make the machine multitasking so that not only it can check for several parameters for monitoring but also carry out other significant tasks on its own.
- Reduction in wastage of time and human efforts.

**VI BLOCK DIAGRAM OF ROBOT SIDE**

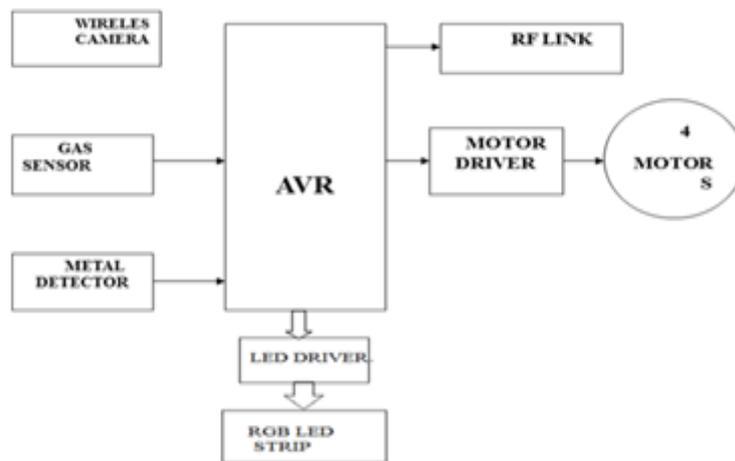


Figure 1: Block Diagram of Robot Side

**VII. BLOCK DIAGRAM OF CONTROLLING SIDE**

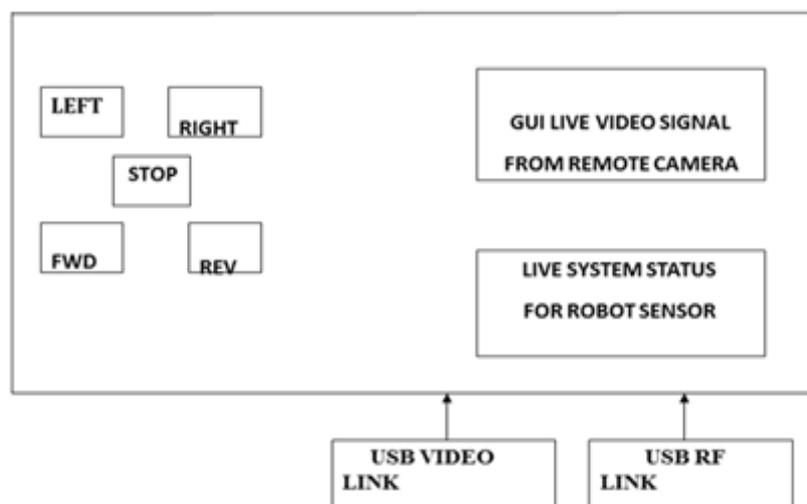


Figure 2: Block Diagram of Controlling Side

## VIII WORKING

The systems have transmitter side and receiver side. Transmitter side have control over Robot and Screen for live system status and video which is recorded by wireless camera fitted on robot. The data is transmitted wireless using RF Link. On receiver side AVR controls the camera and motors using motor driver. Whereas Gas sensor & Metal sensor takes continuous reading and forwards it to user side through RF Link.

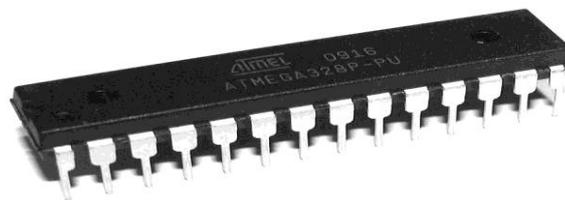
The colour is sensed by using colour sensors and a proportional value is fed to the led strip using the microcontroller.

## IX HARDWARE

### a) AVR – ATMEGA328

An Arduino board consists of an Atmel 8-bit AVR microcontroller with complementary components that facilitate programming and incorporation into other circuits. Arduino have used the mega AVR series of chips, specially the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560.

An Arduino's microcontroller is also pre-programmed with a boot loader, simplifies uploading of programs to the on-chip flash memory



**Figure 3:AVR – ATMEGA328**

### b) RF LINK

- ZIGBEE 802.15.4 Module is applicable for embedded solutions providing wireless end-point connectivity to devices. This is an ideal module for robots to PC or robots to robots communication. This module can give range of 30 meters indoor or 100 meters outdoor. This ZIGBEE wireless device can be directly connected to the serial port (at 3.3V level) of your microcontroller.
- The technology defined by the ZIGBEE specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth. ZIGBEE is targeted at
- radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking.



**Figure 4:RF LINK**

**c) DC MOTOR:**

- An electric motor is an electric machine that converts electrical energy into mechanical energy.
- In normal motoring mode, most electric motors operate through the interaction between an electric motor's magnetic field and winding currents to generate force within the motor.



**Figure 5:DC MOTOR**

**d) Colour Sensor:**

- This color sensor identifies color and gives serial output of RGB value.
- It can identify 16.7 million color shades giving RGB value for the detected color.



**Figure 6: Colour Sensor**

## **X ADVANTAGES**

- Safety of the army personal.
- Key used for security.
- Used integrated commonly available components from market.
- Project is simple and easy to use and understand

## **XI APPLICATION**

- This proposed simple circuit can be used at residential places to ensure better safety.  
It can be used at organizations to ensure authorized access to highly secured places. With a slight modification this project can be used to control the switching of loads through a secure password.

## **XII FUTURESCOPE**

- Use of finer quality and more precise position sensing devices for better accuracy in acquiring the target.
- Wireless data transfer to and from the control station will enable the observation and firing platforms to be separated by greater distances.

## **XIII CONCLUSION**

From this project we conclude that our project provides a better vehicle security that provides easy access to user as well as more security features. Besides this our aim is to military based circuitry and relatively simple cheap, and low cost integrated home security system.

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