Military Robot: A Life Prevention Initiative

Vishwas Mishra[1] Tejasv Dutt Sharma[2] Mrs. Nitya Upadhyay[3]
[1,2]Student [3]Assistant Professor
[1,2,3]Department of Computer Science & Engineering
[1,2,3]ABES Institute of Technology, Uttar Pradesh, India

Abstract— In this paper we present a modern approach for surveillance at border, remote and dangerous areas using multifunctional robots which can be used in defence and security forces operation. Here we are creating a circumstance in which we can substitute the soldiers with robots in any dangerous situation. The robot will inform us if there is any kind of unpleasant situation occurred. It has an additional features in which it performs most of the functions of a soldier by attaching different types of tools, attachments and sensors to it. These robot will make us aware of the situation and the life of the soldier can be saved.
Keywords: Military Robot, Arduino Uno, WSN

I. INTRODUCTION

Over the years there have been many attacks around the world specially in our India. As long as the terror remains India's first enemy so the robots are going to use for saving human life India and many other countries are still facing and confronting with regular threats from terror. The robot is basically a electro- mechanical machine or device that is controlled either by computer program or with electronic circuit to perform different types of tasks. The Robotic Technology also provides automation in offices, factories, hospitals. Besides automation this technology is also used in defence forces, Entertainment, Space exploration, security system and many dangerous mission execution. In defence areas, Robots are usually miniature in size so they are capable to enter in small holes, mines, tunnels, and also have capability to service in harsh and dangerous conditions for a long time without causing any harm.

II. FUNCTIONAL OVERVIEW

A. *Arduino Uno*

- Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.
- The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.
- The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable.
- It can be powered by a USB cable or by an external 9 volt battery

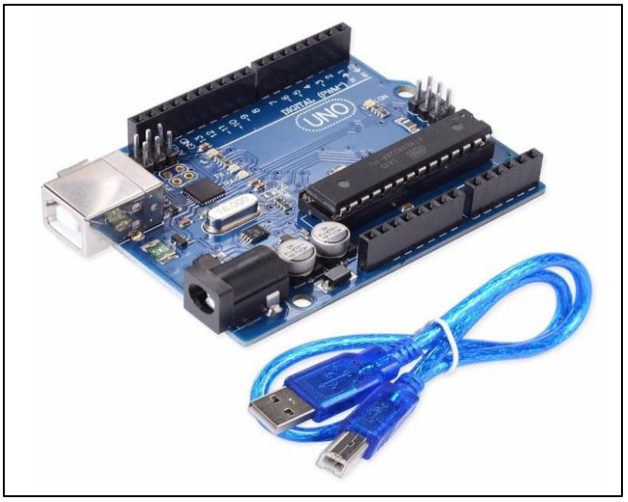

Fig. 1: Arduino Uno.

B. *ESP8266 Wi-Fi Module Connectivity*

- 802.11 b or g or n protocol
- Wi-Fi 2.4 GHz, support WPA or WPA2
- Super small module size (11.5mm x 11.5mm)
- Deep sleep power <10uA
- Power down leakage current < 5uA
- Integrated low power 32-bit MCU
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

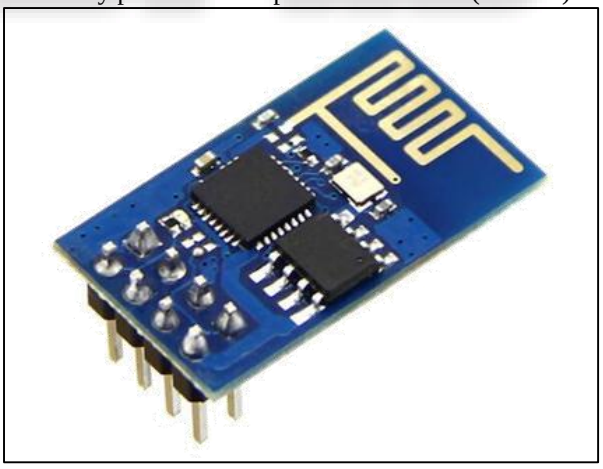

Fig. 2: ESP8266 Wifi Module

C. *Mini Servo Motor S90*

- Operating Voltage is +5V typically
- Torque: 2.5kg/cm
- Operating speed is 0.1s/60°
- Gear Type: Plastic
- Rotation : 0°-180°

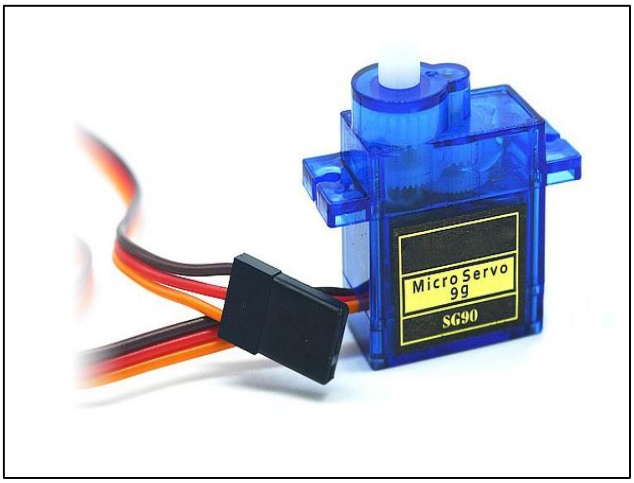

Fig. 3: Mini Servo Motor S90

D. DC Motor

- DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy.
- DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings.
- The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances.

Fig. 4: 12v DC Geared Motor (10 rpm)

E. Acrylic Robotic Arm

- robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm
- links of such a manipulator are connected by joints allowing either rotational motion (such as in an articulated robot) or translational (linear) displacement.
- The links of the manipulator can be considered to form a kinematic chain
- The terminus of the kinematic chain of the manipulator is called the end effector and it is analogous to the human hand.

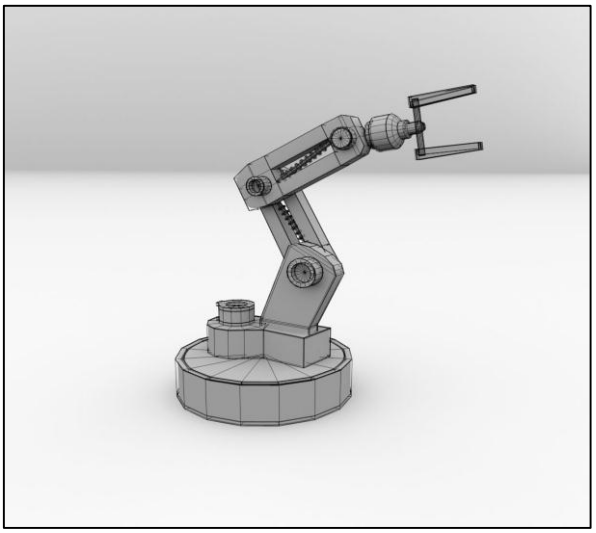

Fig. 5: Acrylic Robotic Arm

F. Battery

- battery is a device consisting of one or more electrochemical cells with external connections provided to power electrical devices
- its positive terminal is the cathode and its negative terminal is the anode.
- When a battery is connected to an external electric load, a redox reaction converts high-energy reactants to lower-energy products, and the free-energy difference is delivered to the external circuit as electrical energy.

III. BLOCK DIAGRAM

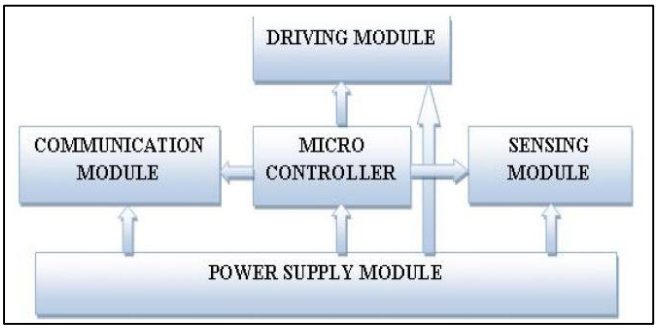

Fig. 6: Block Diagram of Robotic Vehicle

IV. WORKING

This project is developed and designed for saving the life of people. When there is a situation in which it is very dangerous for any human to work. It is used in dangerous situation like war zone, or any hazardous condition such as leakage of harmful gas. If there is any unwanted thing like bomb at any place then, if we send any person to destroy or deactivate that bomb or move it to a different location is very dangerous for the life of that person and to avoid these situations, we use these types of robots. In this robot there is a robotic arm mounted on the base plate of the robot, With the help of mechanical arm we can hold or grab anything and move that thing from one place to another. The Movement of arm is controlled by the servo motors, which move the different sections of the arm to perform different tasks. All The servo's are connected to the Arduino Uno microcontroller board. The Arduino board is comes with the set of digital and analog input/output pins that interface to various other circuits. This robot comes with a Wi-Fi Module ESP8266, which has full Input/output port and wireless 802.11 supported. This Wi-Fi module is fully Arduino compatible which sends and receive all the information to the mobile phone application. The mobile phone application has all the control buttons on it by which we can control this robot.

V. CONCLUSION

These types of robotics techniques enhance the range of any military operations, where the user can control these robots from any place of the world by getting live video of the surroundings as result and feedback. Compared to the earlier robots which works on work on local networks like wi-fi with constraints have very limited operational range. Use of renewable source of energy, smart cell phone as video camera makes it cost effective compared to existing robot. This robotic vehicle with different sub modules can widely be used as surveillance robot for security purpose and emergency rescue operations where human cannot footpace and user will be able to alert prior to intruder in his premises.

VI. FUTURE SCOPE

Irrespective of certain advantages of this system require certain amendments which requires wide coverage range, monitor and control through internet and more user friendly.

A. Wireless Sensor Network

WSN is collection of nodes deployed either statically or dynamically into cooperative network and provides wireless connectivity between these autonomous nodes with IEEE 802.11.4. Using WSN would enhance the coverage range of surveillance areas by deploying mobile nodes equipped with sensors. The primary objectives to design the WSN is to maximize the network lifetime of nodes, miniature sized nodes and minimize energy consumption by choosing specific routing schemes and algorithms to get enhanced throughput.

B. Internet of Things (IOT)

As the technology proliferates rapidly, IOT would add new dimension to world of Information, technology and communication. Currently, the use of Internet exaggerates in our daily life and it would lead to development of technique in which machines, RFID tags, Sensors and Things communicate with each other through Internet of Things (IOT) [12]. As IOT is emerging technology has certain challenge which includes providing unique address to each thing, so it has ubiquitous access over the internet.

REFERENCES

[1] Jain, Khushwant, and Vemu Suluchana. "Design and Development of Smart Robot Car for Border Security." International Journal of Computer Applications76, no. 7, 2013.
[2] Harindravel, Letchumanan. "Mobile Robot Surveillance System With GPS Tracking." (2013).
[3] Shrivastava, Prasun, Abeer Gupta, Akash Singh, and Amritanshu Srivastava, "DTMF Based Security Robot-SECBOT,"
[4] Pavithra, S., and S. A. Siva Sankari. "7TH sense-a multipurpose robot for military." In Information Communication and Embedded Systems (ICICES), 2013 International Conference on, pp. 1224-1228. IEEE, 2013
[5] Zadid Shifat, A. S. M., Md Saifur Rahman, Md Fahim-Al-Fattah, and Md Arifur Rahman, "A practical approach to microcontroller based smart phone operated robotic system at emergency rescue scheme," In Strategic Technology (IFOST), 2014 9th International Forum on, pp. 414-417. IEEE, 2014

