

# Voice Guided Military Robot for Defence Application

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## Abstract

History is a replete with battles and wars since the dawn of civilization. Right from the ancient times, the foot soldiers have fought and won the battle for the victor. However, over the past decade or so, the infantry's role has changed - the emergence of smart munitions and precision aerial bombardment has resulted in the infantryman entering tough urban combat situations to mop up any remaining resistance. Tomorrow's heroic soldiers aren't going to jump into the battle with just a bullet-proof vest, a backpack sized field radio and a commando knife clutched between his teeth. Our system works on voice command given by Voice module V3. The main thing is, we have used IP camera which also uses SD card, this SD card capture and stores the image even if the communication is destructed in fact also when only camera is in motion. Thus our aim is to provide a robotic system that can combat in wars and other military purposes.

**Keywords: PIR Sensor, Ultrasonic Sensor, IP Camera, Voice Recognition Module, Gun**

## I. INTRODUCTION

Necessities are the mother of inventions. Whenever Human being finds the need of something it will lead to a Wonderful 1 invention. After the 09/11 attack at World Trade Centre, America, all country started focusing on how to control the attack of terrorism and how to improve the security to a nation. As a result, some nations started using of robots in the defence field. Since tracking of enemies at far areas is much difficult for spies. There is a possibility of loss of life in the war. So our idea is to replace the human with the robot means replacement of live soldier to artificial soldier.

## II. EXISTING SYSTEM

There is much advancement in the field of engineering, robotics in particular. Many robotic systems have been developed for various purposes. There are certain systems which are used for automatic motion of vehicles in road and wheel chairs which can help disabled. There are also robotic systems which can be used for defense purposes. In addition to these advancements there are also robotic systems which can combat in war times. This robot is named "Wired for War" has vision and motion. The vision system is used to carry out human detection and tracking. The motion system is built by using embedded systems and used to achieve motion planning in real time.

## III. PROPOSED SYSTEM

In existing system there is only remote monitoring for robots are available. Here in our system we are going to control the robot with Voice Module. As an adjunct feature we are also planning to have an automatic mode in which it can take its own decision for combating. In addition to this we are also including some of the features like detection of dead personnel through temperature sensor, using night vision IP camera so that robot can work in night also not only in day light. Thus our system is more reliable to combat the enemy than the existing system. We are going to control the robot with Voice Module V3 by using a computer and we are using Fire Gun as an actuator.

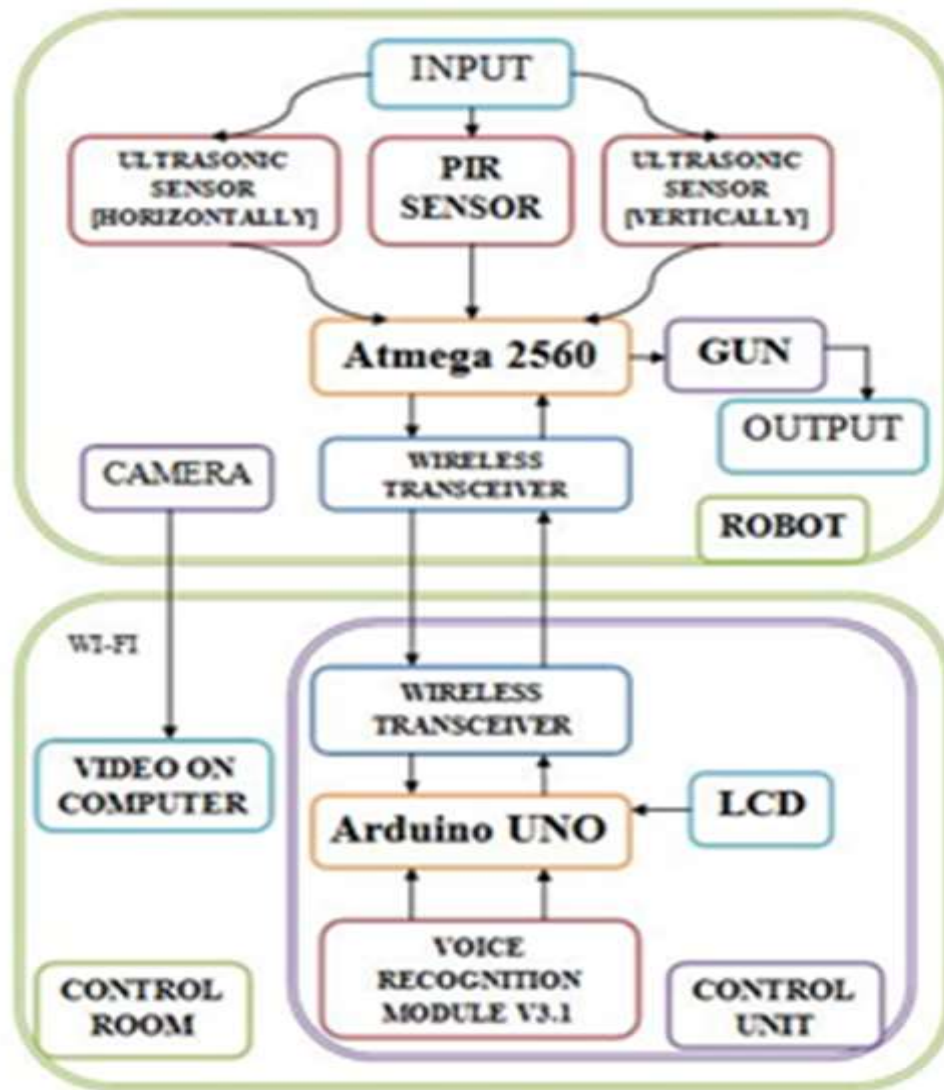


Fig. 1: Proposed System

The project aim is to designing a robot which is capable for defending if any ruining object coming from the opponent side. The robot is also operated through Voice Recognition Module V3 using wireless module. When PIR Sensor and Ultrasonic Sensor which are input of the robot, senses any human or artillery object, we can get information through Camera (24\*7 service) on Computer in control room. Ultrasonic sensor gives the distance between the robot and object/human which is display on 16\*2 LCD. Accordingly, we give command through Voice Recognition Module V3, (like: Fire, Forward, Reverse, Backward, Left, Right) that will be transferred from control unit's Arduino Uno to Robot's Atmega 2560 by wireless module and after that Gun will actuate/any other command follow by robot which is the output of the robot.

#### IV. HARDWARE REQUIREMENTS

##### A. Atmega-328p

Atmega-328p is a 28 pin High Performance microcontroller. It has 23 programmable I/O pins to process the digital and analog information, two 8-bits timers or one 16-bit timer, an improved 10-bit A/D converter with 6 input analog inputs. It has low power consumption which can be in the mode such as active mode, Power-down mode and Power-save mode. In the system it is used to take command from voice module V3 and send that particular character so that it can be displayed at LCD.

##### B. ZIG-BEE

Zigbee is used to transfer the data from the control unit to the rover unit and vice-versa, so basically it is working as a wireless medium. It uses mesh topology which allows Zig-Bee devices to automatically connect with and transmit data through one another without the need of central gateway like a router. It has low power consumption and low data rate. Hence it is easy and efficient to send the instructions like turn on the device, rotate right, left, etc.

### C. Motor Driver

L293D is a monolithic integrated high voltage; high current four channel driver designed to accept TTL Logic levels and drive switching power transistors. L293D is assembled in a 16 lead plastic package which has 4 centre pins connected together and used for heat sinking. It is designed to control 2 DC motors. It requires separate power supply because it operates at high current and low voltage hence the operation of the whole circuit is protected from it by using separate battery supply. Its operation is shown in the table below

Table – 1  
Operation of Motion Driver

OPERATION	DRIVER 1	DRIVER 2
STOP	LOW	LOW
ANTICLOCKWISE	LOW	HIGH
CLOCKWISE	HIGH	LOW
STOP	HIGH	HIGH

### D. DC Motor

DC motor is used for movement and locomotion purpose of the rover. It has high revolution per minute and low torque. In general robotics requires low revolution per minute and high torque.

### E. Servo Motor

Servo motors are widely used in radio control models and also used in robotics because of its small size and Low cost. Servomotor has built in motor, gearbox, position feedback mechanism and motor controller. The servo motor can be adjusted to any position, by using simple pulse controlling. In the system it is used for the 180° rotation of Gun and Ultrasonic sensor.

### F. Wireless IP Camera

A camera is a device that records images, either as a still photograph or as moving images known as videos. This is used in the robot to take the video surveillance of the area and it is transmitted using a carrier Signal. On the receiving end it is converted to video signal. It will be at ON state 24\*7 so that user can give further command. The main thing to notice here is, this camera uses SD card, this SD card capture and stores the image even if the communication is destructed in fact also when only camera is in motion.

### G. PIR Sensor

A passive infrared sensor (PIR Sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. This PIR module is used for motion detection. It can work from 5V to 9V DC and gives digital output. It requires 10-60 seconds of settling time before starting its operation. It can detect motion up to 6 meters. It consists of pyroelectric sensor that detects motion by measuring change in the infrared levels emitted by the object.

### H. Ultrasonic Sensor

It is essential to give robot eyes for preventing crashes. Ultrasonic sensors, also known as transducers, have a similar working system as RADAR and SONAR by interpreting the echoes of radio or sound waves generated by the sensor. This sensor is a high performance range finder. In this project an amazingly wide range from 2cm to 4m Ultra Sonic sensor is used. This ranger is a perfect for any robotic application or any other projects requiring accurate ranging information. This sensor is connected directly to the digital I/O lines of our microcontroller. In the project this sensor is used horizontally and vertically (for RADAR purpose).

### I. LCD

A 16×2 LCD display is very basic module and has a very eminent use in various devices and circuits. These modules are better and preferred over seven segments and other multi segment LEDs. In the proposed project LCD is used to display the results conducted by the controller, so that further process to be carried on by the user side.

### J. Voice Reorganization Module V3

Voice recognition is a technique that facilitates natural and convenient human-machine interface using the voice recognition module. In the system it is used to give voice commands. It trains (the process of recording the voice commands) and load (copy trained voice to recognizer). It supports 80 commands, so in toto we can give 80 commands like forward, backward, reverse, left, right, fire etc.

### V. FLOW CHART

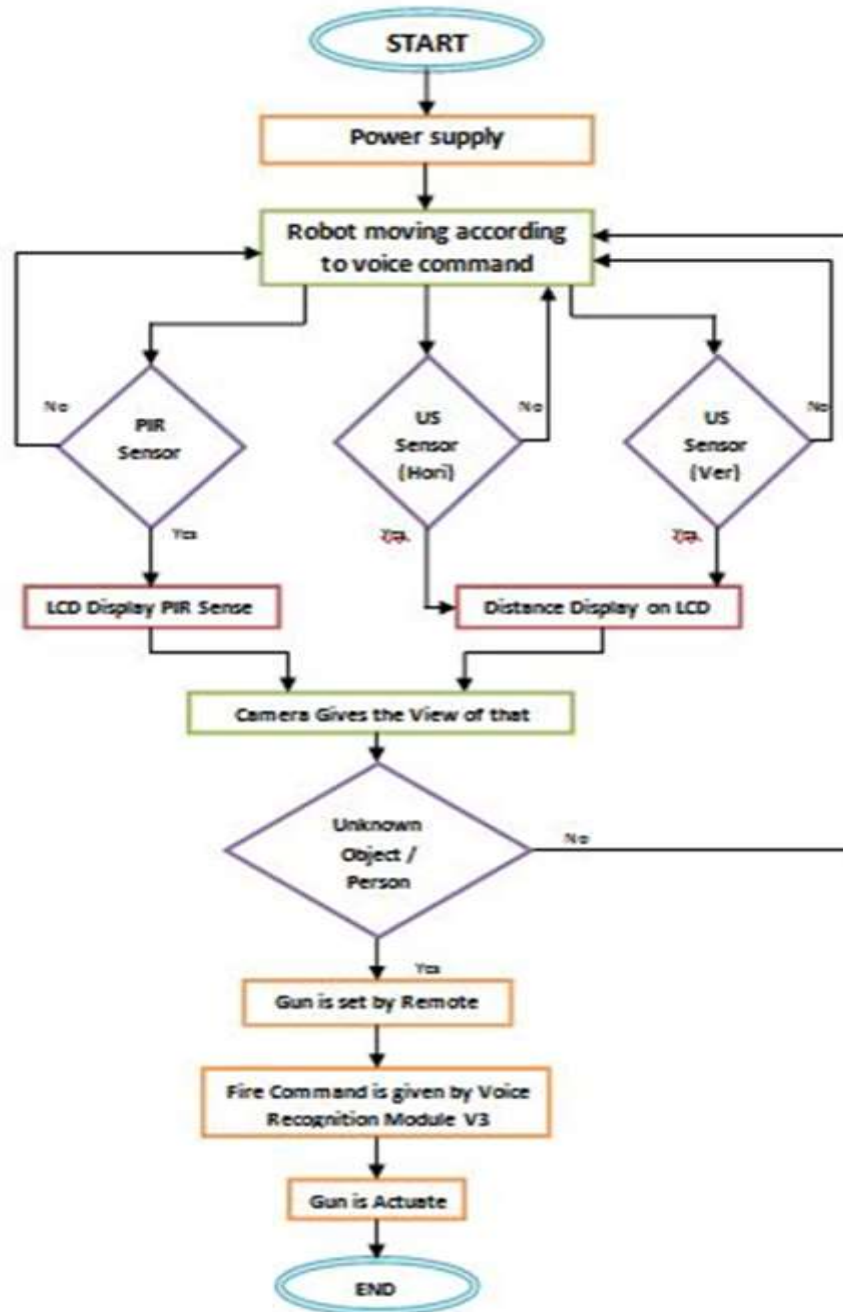


Fig. 2: Flow Chart

### VI. FUTURE ENHANCEMENT

Our future aim is to reduce the response time to a greater extent. We are also working on adding some more new applications to our robot.

### VII. CONCLUSION

The proposed system is aimed towards the welfare infantry to minimize the casualties to a great extent. A defense surveillance robot is designed in this project. Using sensors to sense the path and obstacles, controller program is designed so as to enable the atmega328 to control robot, using Voice Module V3 and wireless communication. In the near future armed robots will be used in war field in order to save the life of soldiers. Our robot also has terrain climbing facility so that it can be used in hilly regions. Hence, we are sure to create a revolution through this project “Wired for War” in its own field and ensure complete support from people of different societies.

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