

# Motion Controlled Military Tanker

<sup>1</sup>Kante Murali, <sup>2</sup>M. Muralidhar, <sup>3</sup>P.Sindhoori, <sup>4</sup>M. Shanthi,  
<sup>1</sup> professor, <sup>2</sup> Associate professor, <sup>3</sup>Assistant professor, <sup>4</sup>Assistant professor  
Electronics & Communication Engineering  
Narayana Engineering College, Nellore, Andhra Pradesh, India

**Abstract:** Most of the deaths in Military applications due to physical presence of person. There is need to decrease physical appearance of person in war and let the robots fight between themselves and decide the winner. At present our soldiers are using tankers that should be driven by one or more soldier. When that tanker get hit by a shell then soldier may loss his life or may become physically handicap. To avoid this we are trying to introducing hand gesture technology in military tankers. The outlook will be like game for soldiers and based on their hand moment the panzer moves forward, right, left, rotate and fire. In case, if our tanker got hit by any shell then there will be no loss of life. For this, we approach by creating a working model that demonstrates whole process who it works. This might change entire principles of war and may lead to new generation.

## II. INTRODUCTION

Recently, strong efforts have been carried out to develop intelligent and natural interfaces between users and computer based systems based on human gestures. Gestures provide an intuitive interface to both human and computer. Thus, such gesture-based interfaces can not only substitute the common interface devices, but can also be exploited to extend their functionality. A robot is usually an electro-mechanical machine that can perform tasks automatically. Some robots require some degree of guidance, which may be done using a remote control or with a computer interface. Robots can be autonomous, semi-autonomous or remotely controlled. Robots have evolved so much and are capable of mimicking humans that they seem to have a mind of their own. An important aspect of a successful robotic system is the Human-Machine interaction. In the early years the only way to communicate with a robot was to program which required extensive hard work. With the development in science and robotics, gesture based recognition came into life. Gestures originate from any bodily motion or state but commonly originate from the face or hand. Gesture recognition can be considered as a way for computer to understand human body language. This has minimized the need for text interfaces and GUIs (Graphical User Interface). A gesture is an action that has to be seen by someone else and has to convey some piece of information. Gesture is usually considered as a movement of part of the body, esp. a hand or the head, to express an idea or meaning. Our objective is to make this device simple as well as cheap so that it could be mass produced and can be used for a number of purposes

## II.LITERATURE SURVEY

Gesture recognition technologies are much younger in the world of today. At this time there is much active research in the field and little in the way of publicly available implementations [1]. Several approaches have been developed for sensing gestures and controlling robots. Glove based technique is a well-known means of recognizing hand gestures. It utilizes a sensor attached to a glove that directly measures hand movements.

A Gesture Controlled robot is a kind of robot which can be controlled by hand gestures and not the old fashioned way by using buttons [2]. The user just needs to wear a small transmitting device on his hand which includes a sensor which is an accelerometer in our case. Movement of the hand in a specific direction will transmit a command to the robot which will then move in a specific direction. The transmitting device includes a Comparator IC for assigning proper levels to the input voltages from the accelerometer and an Encoder IC which is used to encode the four bit data and then it will be transmitted by an RF Transmitter module [3].

At the receiving end an RF Receiver module will receive the encoded data and decode it by using a decoder IC [4]. This data is then processed by a microcontroller and passed onto a motor driver to rotate the motors in a special configuration to make the robot move in the same direction as that of the hand.

There exist some works in the field gesture recognition in which instruments are designed and build for man-machine interface using a video camera to interpret the American one-handed sign language alphabet and number gestures (plus others for additional keyboard and mouse control)[5,6]. Humans communicate mainly by vision and sound, therefore, a man machine interface is also available which is intuitive. It makes greater use of vision and audio recognition. Another advantage is that the user not only can communicate from a distance, but need have no physical contact with the computer. However, unlike audio commands, a visual system will be preferable as in noisy environments or at situations where sound would cause a disturbance. There is a simplification used in this project, which was not found in any recognition methods researched. The number of different gestures recognized and the recognition accuracy are amongst the best found

A Motion Gesture Controlled robot is a kind of robot which can be controlled by your hand gestures not by old buttons. You will be having a small transmitting device in your hand which included an accelerometer. This will transmit an appropriate command to the robot through RF pair, so that it can do whatever we want.

**III.PROPOSED METHOD:**

The block diagram of gesture controlled robot is shown in figure1. A Gesture Controlled robot is a kind of robot which can be controlled by your hand gestures not by old buttons. You just need to wear a small transmitting device in your hand which included an acceleration meter. This will transmit an appropriate command to the robot so that it can do whatever we want. The transmitting device included a ADC for analog to digital conversion and an encoder IC(HT12E) which is use to encode the four bit data and then it will transmit by an RF Transmitter module. At the receiving end an RF Receiver module receives the encoded data and decodes it by and decoder IC (HT12D). This data is then processed by a microcontroller and finally our motor driver to control the motors. As user makes movements of his hand in front of it, it senses and according to that it sends the signal for decision. Output from accelerometer is gathered for process by microcontroller.

As per sensor output, the controller is made to work according to the program written inside it and it sends the respective signal to third part which is motors. This is the last part which drives the wheel of our robot. It uses two dc motors to make movement. To drive them one motor driver is IC used which provides sufficient current to motors. All this material is mounted on metal chesis. As we move our hand to right robot will move to right side. Similar to this it will copy all our movements

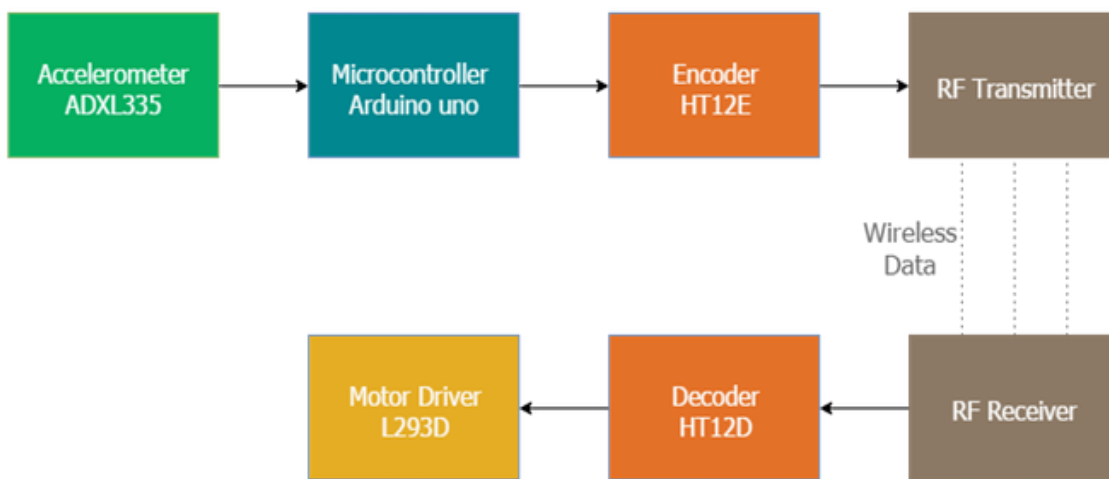


Fig 1 : Block Diagram Of Gesture Controlled Robot

**3.1 WORKING PRINCIPLE**

The gesture controlled robot works on the principle of accelerometer which records hand movements and send that data to the comparator which assigns proper voltage level to the recorded movements. That information is then transferred to an encoder which makes it ready for RF transmission. On the receiving end, the information is received wirelessly via RF Decoded information. These decisions are passed to the motor driver that is which triggers the motors in different configurations to make the robot move in specific direction.

**IV.EXPERIMENTAL RESULTS**

Various experiments have been conducted to determine the best fitting correlation value for this project on gesture controlled bot. Two axes of the accelerometer is used for the project i.e. X and Y. The analog values obtained from the accelerometer were from the range 0-5 volts which were mapped to 10 output channels which were ranging from 0-1023 using analog Read() function as shown in Table 1 & Table 2. For forward and backward motion, Y axis values are found to be constant. Similarly for left and right motion X axis values were found to be constant. The below figure 2 represents the forward, backward, left and right positions of the controller with the accelerometer fixed upon it

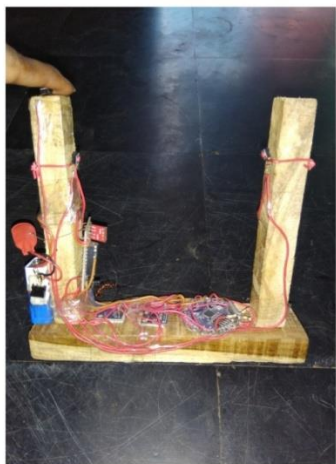
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GESTURES	X axes value	Y axes value
LEFT	$319 < X < 346$	$344 < Y$
RIGHT	$319 < X < 346$	$Y < 321$
FORWARD	$X < 344$	$319 < Y < 344$
BACKWARD	$X < 321$	$319 < Y < 345$

GESTURES	X axes value	Y axes value
CLOCKWISE	$335 < X < 355$	$335 < Y$
ANTICLOCKWISE	$319 < X < 340$	$Y < 328$

Table 1 Accelerometer Readings For Motion

Table 2 Accelerometer Readings For Gun Rotation



(a) forward motion control gesture



(b) backward motion control gesture



(c) left motion control gesture



(d) forward motion control gesture

Fig 2 : Different rotation of Gesture

## V.CONCLUSION

In the race of man v/s machines, hand gesture controlled bot comes as an e.g. of companionship of man and machine. Taking the technology to the next level from speech recognitions and wired connections, the technology of wireless hand gesture control is used. There is a rapid growth on application development considering gesture recognition system. So in this paper, a model of a robot based on “Human Machine programmer” can also control a robot quickly and in a natural way.

In future we can design a wireless robot which can sense hand gesture by using wireless technologies. It can be used in military applications as a robotic vehicle which can be handled by a soldier to avoid casualties. Our system has shown the possibility that interaction with machines through gestures is a feasible task and the set of detected gestures could be enhanced to more commands by implementing a more complex model of a advanced vehicle for not only in limited space while also in broader area as in the roads too. IP cameras can be attached to improve video transmission range as well as quality

## VI.FUTURE SCOPE

Various sensors can be attached to it as per user’s requirement like metal detectors for detecting metals below small tunnels, gas sensors to detect gas leakage in remote areas in industries

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