# Hand Gesture Controlled Robot

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***Abstract. Recently, vigorous attempts have been accomplished to expand brilliant and essential attachments amongend users and computer-established scheme built on human gestures. Gestures bringan automatic attachment to the two human and computer. So, like gesture-based attachments cannot alone alternate the common interface devices, but can also be employed to prolong their functionality. In this paper, a hand gesture-controlled car is designed with the help of Arduino. The movementsof the hand is used to control the car rather than employing a remote along with buttons or video game joystick. This paper is based on wireless transmission, position of the bits taken by the hand movements given through the car by RF wireless connection.***

***KEYWORDS: ADXL335 Accelerometer Sensor, Arduino Nano, HT12E & HT12D Encoder & Decoder IC.***

## 1. Introduction

A Gesture controlled robot car was directed by usage of hand movements in position of older methods such as videogame joysticks etc. Here, the only thing needed from a person operating, is to changing their hand position to control a robot car[1]. The sending module was used on our hand that carries RF 434MHz Transmitter module and the accelerometer. That sends the corresponding bits to the robot car so that it can undertake the desired task like travelling back, front, left, right and halt. All the above duties will be performed by simply moving the hand.

The present progressive technology within the field of science is Robotics. The freshly growing technology is largely useful to the people in the coming years. These days a large count of cordless robots are developed, these are used in various applications. In order to increase the support of robots in our regular lives, we require discovering a productive method of exchanging information with robots.For this sole reason, there has been definite evolution in the area ofhuman- machine connection. In order to enlarge the use of robot cars in locations where conditions are not definite like military rescue operations, robot cars can be used to hike the commands of a man operant and finish the job specifically. That suggests a logical approach of tracing and identification of hand movements which is directed to be used as human-robot connection interface.

Large The main reason of using hand movements is that it gives an easier way of regulating and governing the robot car. Through that aspect, robots might be used as wheelchair or as a detective robot or for surveillance. As human hand gestures are typical, with the support of wireless communication, it is simple to connect with the robot in a too-nice way. The robot actions depends on the movements formed by hand.

## 2. Proposed System

All This design is mainly divided into two segments, first is the transmitter segment and other was the receiver segment. Here transmitter sends the appropriate signal to placing of the accelerometer and the user's hand gesture gives the receiver a signal hence the robot will act in the desired side.

According to movement of the accelerometer sensor placed at the hand, it transmits corresponding bits to RF transmitter module and taken at the receiver end which drives the gear motors to the desired direction.

As car goes front, back, right, left when we tilt our hand to the front, back, right, left directions   Robot halts during the hand is zero degrees with respect to the ground.
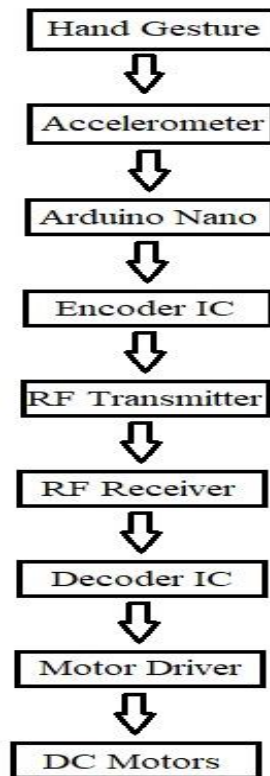


**Fig1: Flowchart of the Proposed System**

### 3.   Hardware & Software

- ADXL335 Accelerometer sensor
- Arduino Nano module
- HT-12E Encoder IC
- RF 434MHz Transmitter
- RF 434MHz Receiver
- HT-12D Decoder IC
- L293D Motor Driver IC
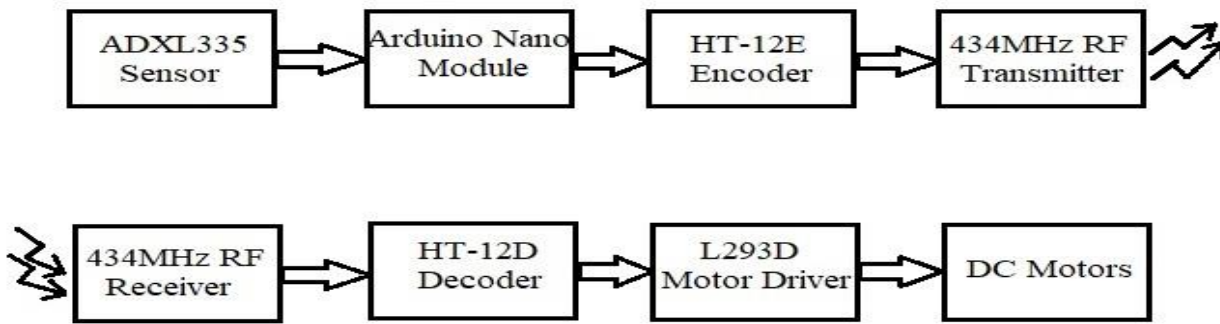- Arduino IDE

## 4. Block Diagram



Figure2.Block diagram of the proposed system

## 5. Methodology

Here in this paper, a robot car which was controlled with the gestures made by the hand was developed. The Working of the robot car is as follows.

As indicated before, the gesture controlled robot car was cordless processed robot and having two sectors: Transmitter and Receiver.While the robot was given the appropriate power supply, the transmitter sector, which has an Arduino nano module, ADXL335 sensor, HT12E Encoder and RF transmitter, would constantly examine the ADXL335 Accelerometer sensor. The data is taken by Arduino nano board, then it sends the appropriate bits of data to the Encoder, positioned in the direction of the ADXL335 Sensor. Bits of parallel data that are received by the encoder are changed into serial data bits and this serial data those are sended by the RF Transmitter module.

In receiver section, RF Receiver gets the bits of serial data and sent it to the Decoder IC. The Decoder would transform the serial data to parallel data bits and this parallel data bits are next given to the motor driver IC. Based on the data, the action of the gear motors, and hence the action of the robot is defined.

## 6. Hardware Module &Result
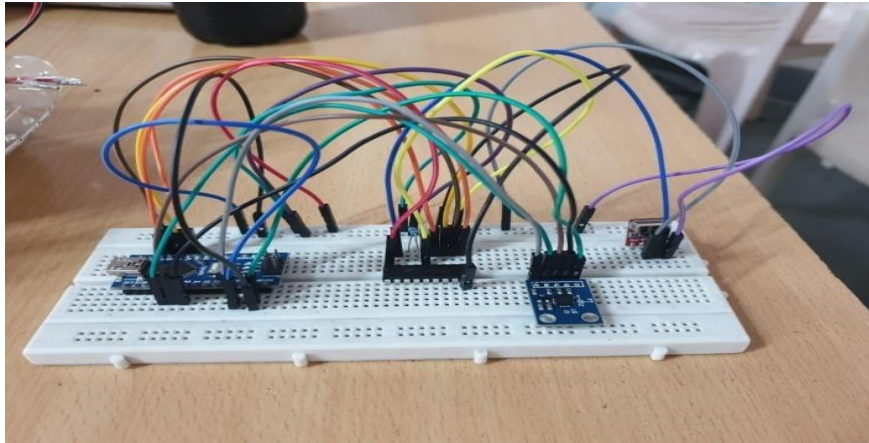


Fig. 3. Hardware Module
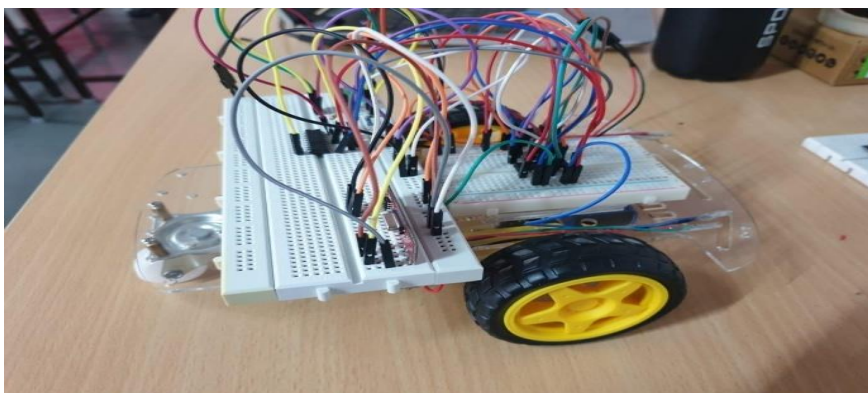
Figure 4. Transmitter Section



Figure 5. Receiver Section

## 7. Conclusion

We have accomplished our objective in the absence of hurdles i.e. the control of a robot using gestures. The robot was displaying desired outputs whenever we move our hand in the desired direction. For managing the robot using remote, Holteks' encoder-decoder pair is used.

Finally, we conclude that our paper is better than the existing paper which is based on MPU6050 Accelerometer. Since, MPU6050 is a 6 axis device; it is mainly used in the applications such as drones. Our project requires a two- dimensional accelerometer, so we used an ADXL335 Accelerometer.

## 8. References

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