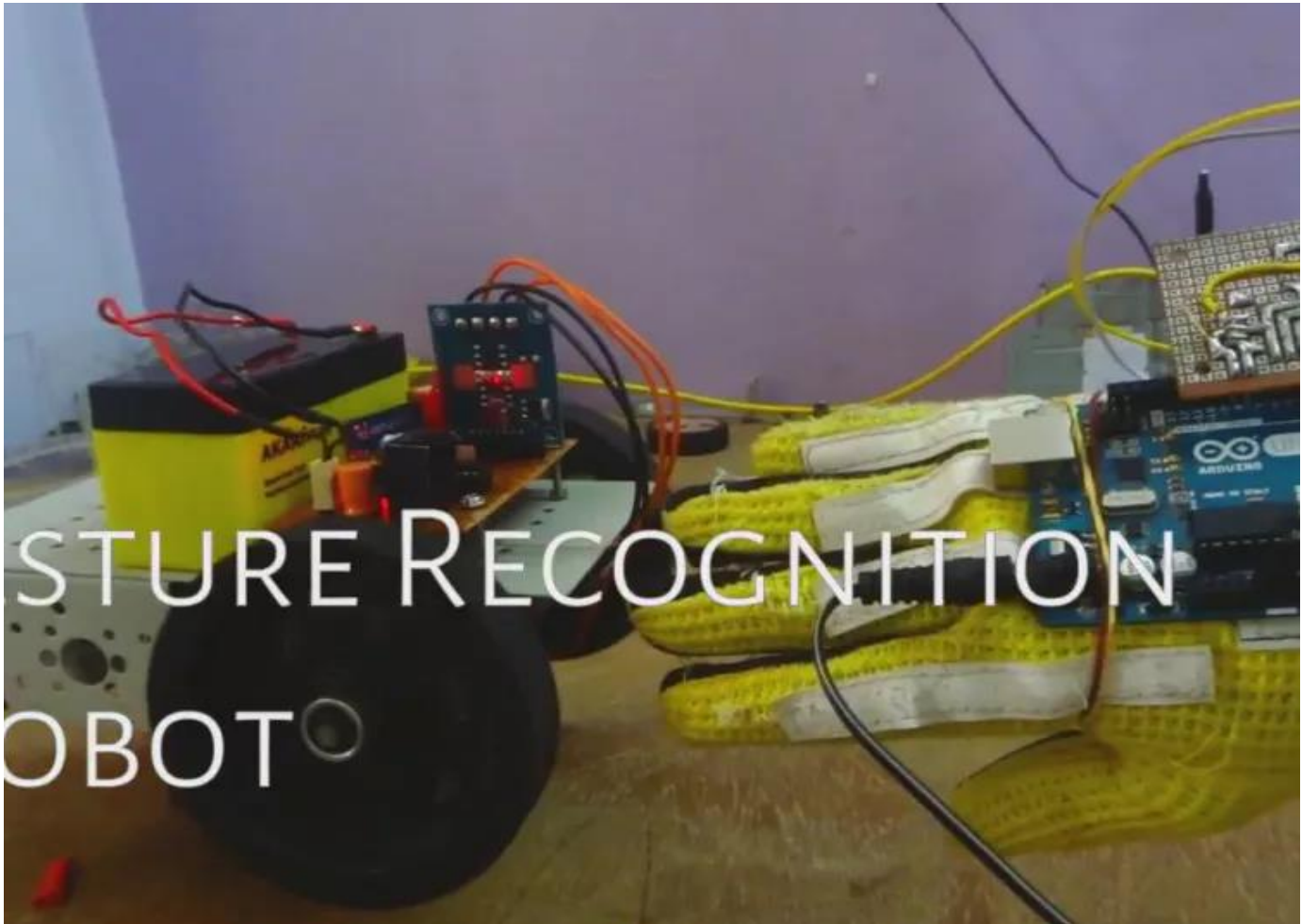This gesture controlled robot uses Arduino,ADXL335 accelerometer and RF transmitter-receiver pair.

Components needed

1) Arduino Uno R3 Genuino = 1pcs
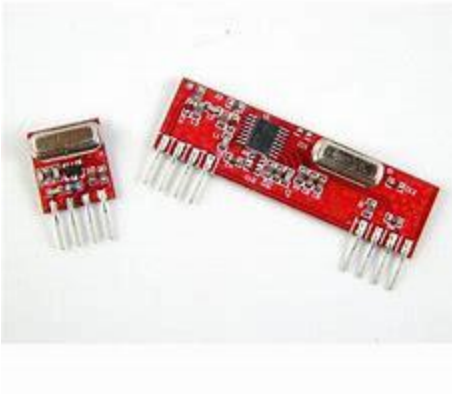
https://www.amazon.in/Arduino-ATmega328P-Cable-length-feet/dp/B06XBMB9T1

2) ADXL335 Accelerometer triple axis = 1pcs

https://www.amazon.inGeneric-ADXL335/

3) RF Module – 434 mhz   = 1pcs

4) HT12D(decoder)

5) HT12E(encoder)

6) L298 motor driver

https://www.amazon.in/s?k=l298n+motor+driver

7) pcb (generic) = 1pcs

8) linear regulator ic = 2pcs

9) DC motor = 2pcs

Software needed

 arduino IDE

INTRODUCTION

I wish I could control everything with my hands! Sitting in my chair and controlling things like a BOSS. I'd love it! So I finally came out with a cool DIY hand gesture recognition robot, which can follow the commands made by hand gestures. Sounds crazy but I promise it's very simple. Making a gesture control robot is actually very simple. This robot is a improvement of my another DIY project RC car using RF module.

Here too, the robot is divided into two parts, transmitter and receiver. The receiver circuit is the same as that of the old post and there is only a slight change in the transmitter circuit, here we need to program the transmitter circuit. So I will be using an Arduino as the programming platform. To recognize the gestures made I will be using an accelerometer sensor. So let's get building!

How does it work and recognize the gestures?

Here the brain of the robot is Arduino Uno (Atmega32) it is fed with some set of code. The gestures/motion made by hand are recognized by a acceleration measuring device called accelerometer (ADXL335).
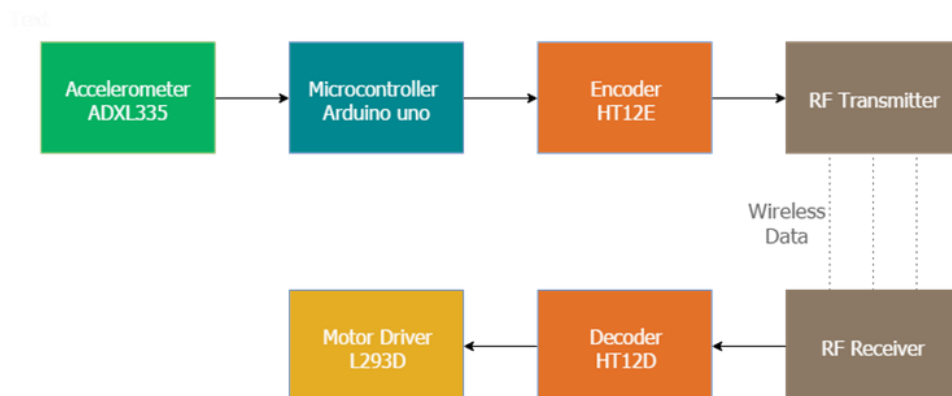

Here the accelerometer reads the X Y Z coordinates when we make gestures by hand and send the X Y Z coordinates to the Arduino (here we don't need the Z axis we need only two coordinated X and Y So neglect the Z coordinate). The Arduino checks the values of coordinates and sends a 4 bit code to the Encoder IC. The Encoder passes the data to RF transmitter and the transmitted data is received by the RF receiver. The receiver sends the 4 bit code to the Decoder

IC and the decoder passes it to Motor Driver IC. Later the motor driver makes the decision to turn the two motors in the required direction

Make the power supply

First we will start with the power supply circuit. We need two power supply circuits: one for the transmitter and one for receiver. The receiver circuit needs to powered using 12V supply (since I am using a 12V motor) and the transmitter circuit can be powered using 9V battery.
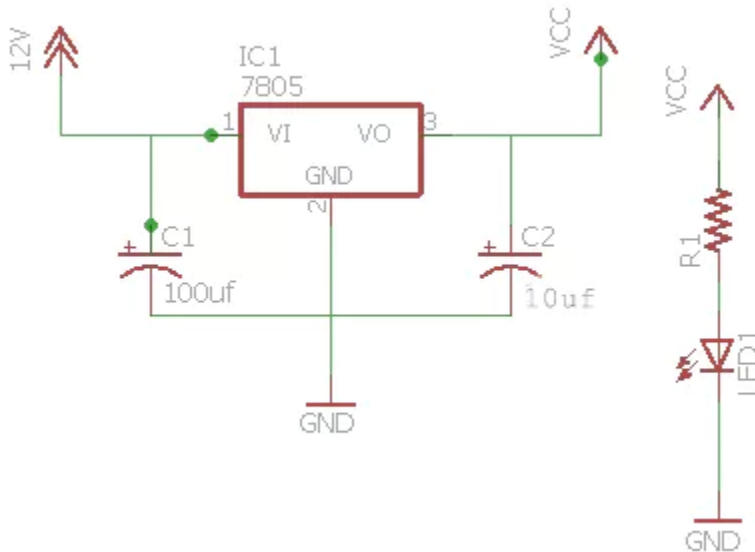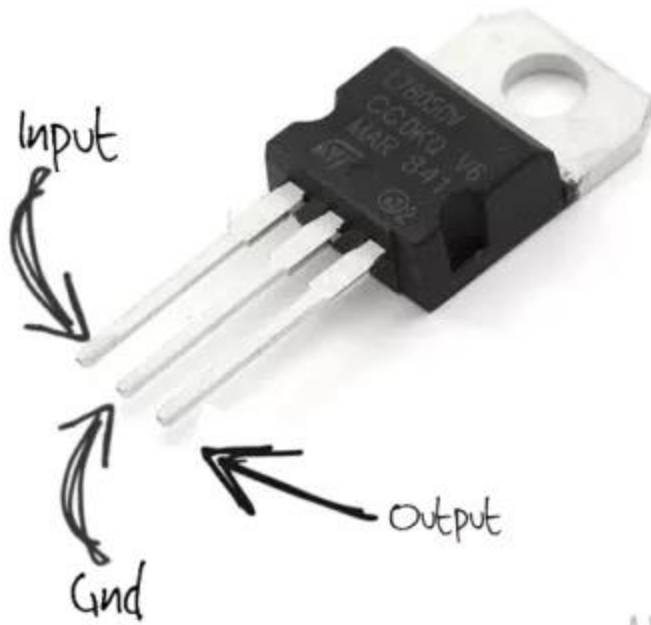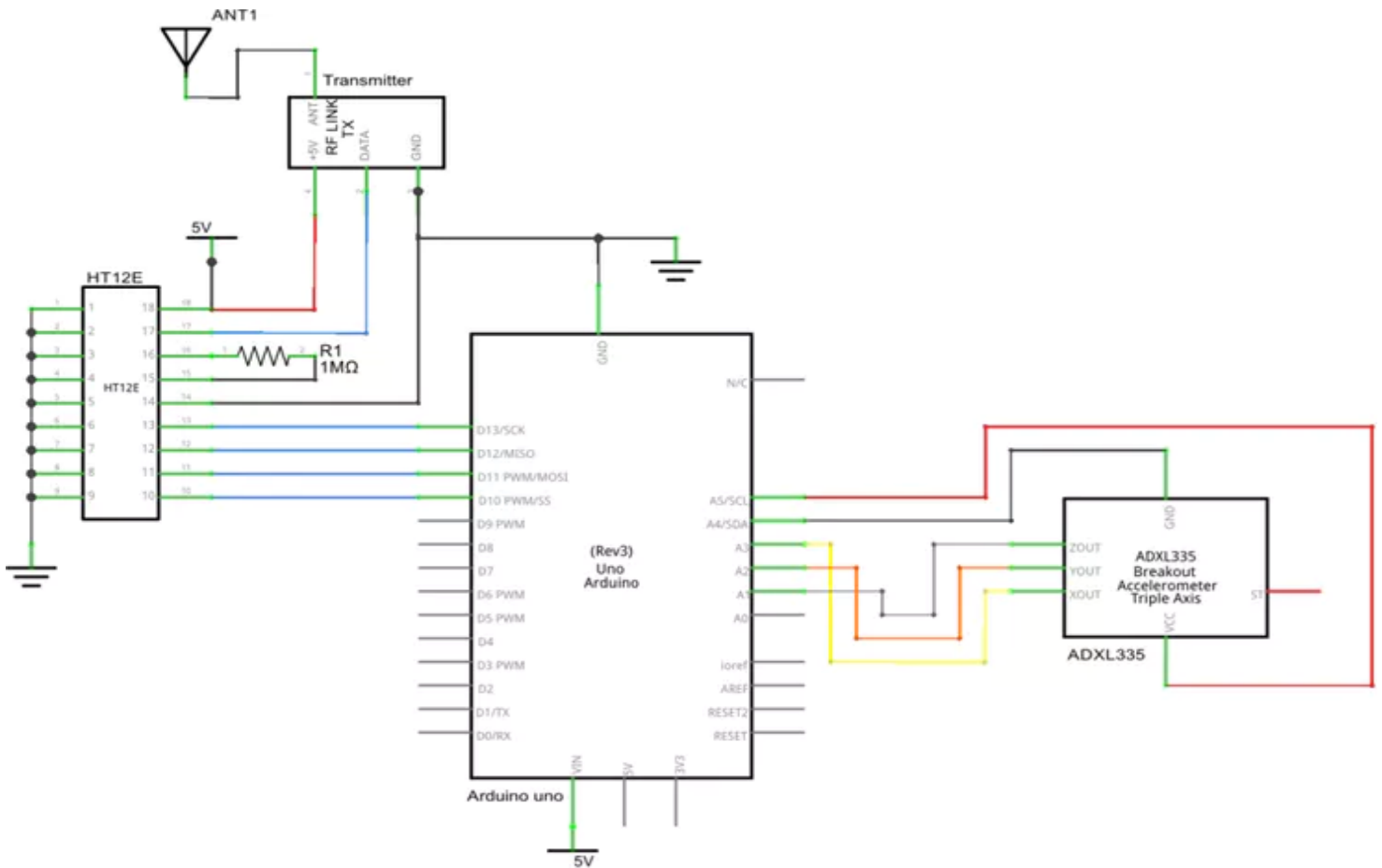
- **IC 7805 which regulates the 12V supply to 5V (if you can't get a 12V supply you can use a 9V supply)**
- **0.1uf and 470uf capacitor**
- **1k resistor for status LED**

Make the transmitter circuit

It consists of Arduino Uno , ADXL335 Accelerometer , Encoder IC and a Transmitter module . The signals from the accelerometer is fed to the analog pins of arduino. Arduino has an inbuilt analog to digital coverter (ADC). The encoder it into machine readable form. And finally the transmitter will transfer the signal to the robot.

RECEIVER CIRCUIT
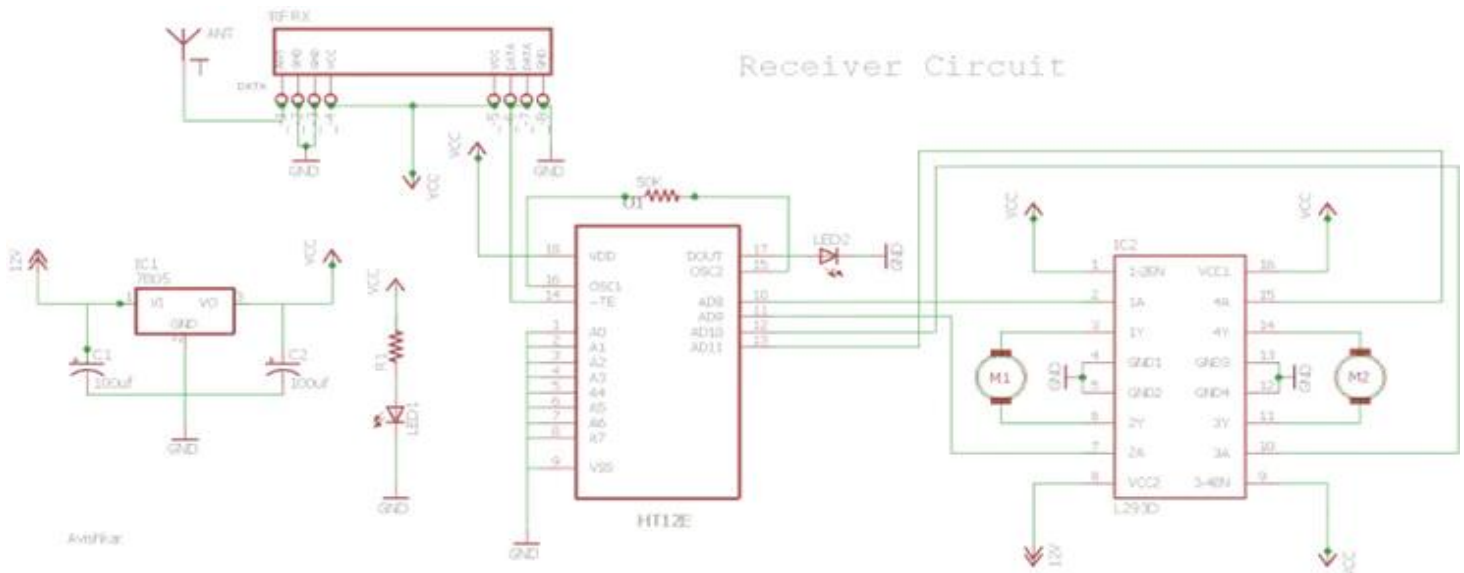
Receiver Circuit

The receiver circuit consists of 2 IC (HT12D decoder, L293D motor driver), RF receiver module.

Wire the circuit as per the above receiver schematic. There are 2 LEDs in the receiver board, one lights up when the power supply is given to the receiver and the other when power supply is given to the transmitter circuit. The LED near the IC HT12D should light up and this provides you a valid transmission (VT) when power is given at the transmitter if not there is something wrong with your connection or your RF-TX-RX module.
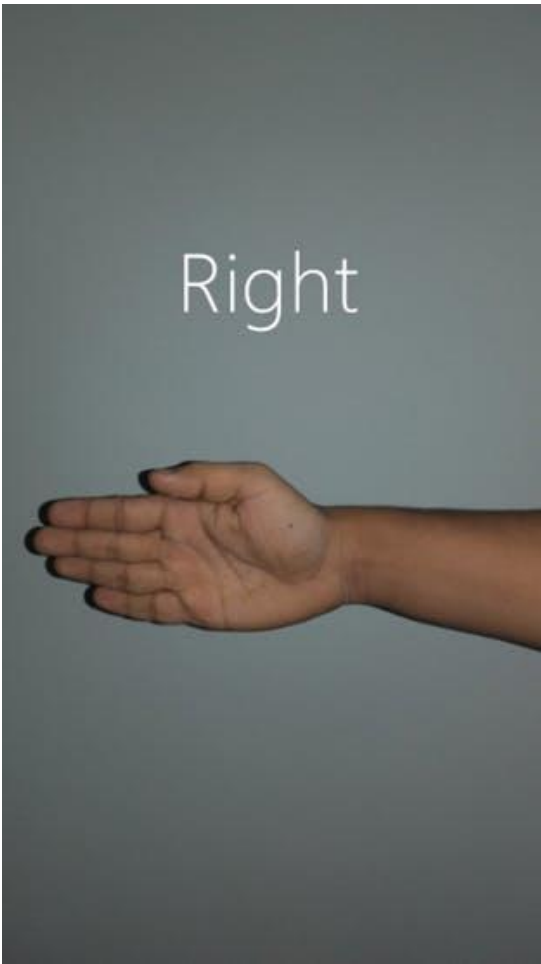
UPLOAD THE CODE TO ARDUINO

https://www.hackster.io/mayooghgirish/hand-gesture-controlled-robot-4d7587#toc-upload-code-to-arduino-6
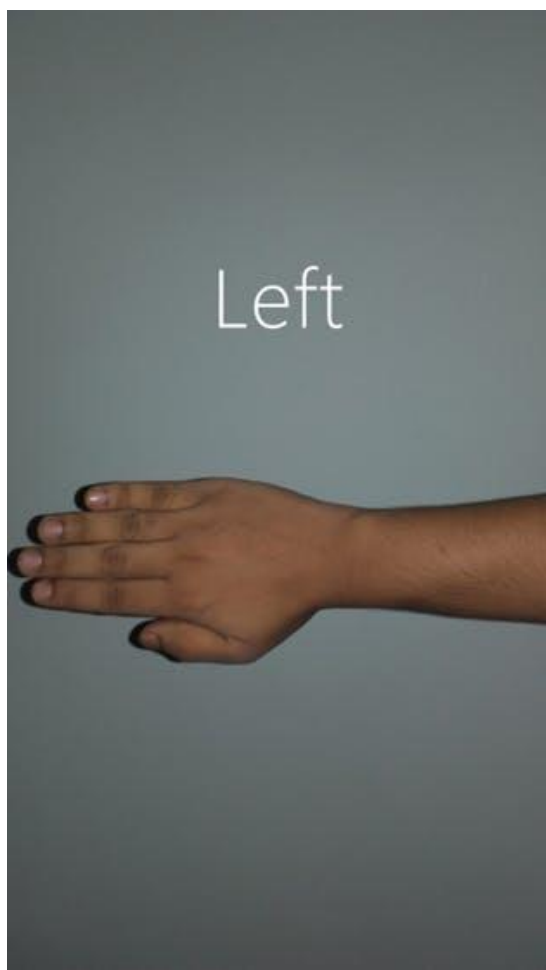
What gestures will the robot recognize?

This robot is designed for recognizing five sets of gestures: forward, backward, left, right and stop. You will get a better idea if you check the photos of the gestures given below.

Stop_flat

right_flat

Left

left_flat

forward_flat

backward_flat

Enjoying driving your robot.