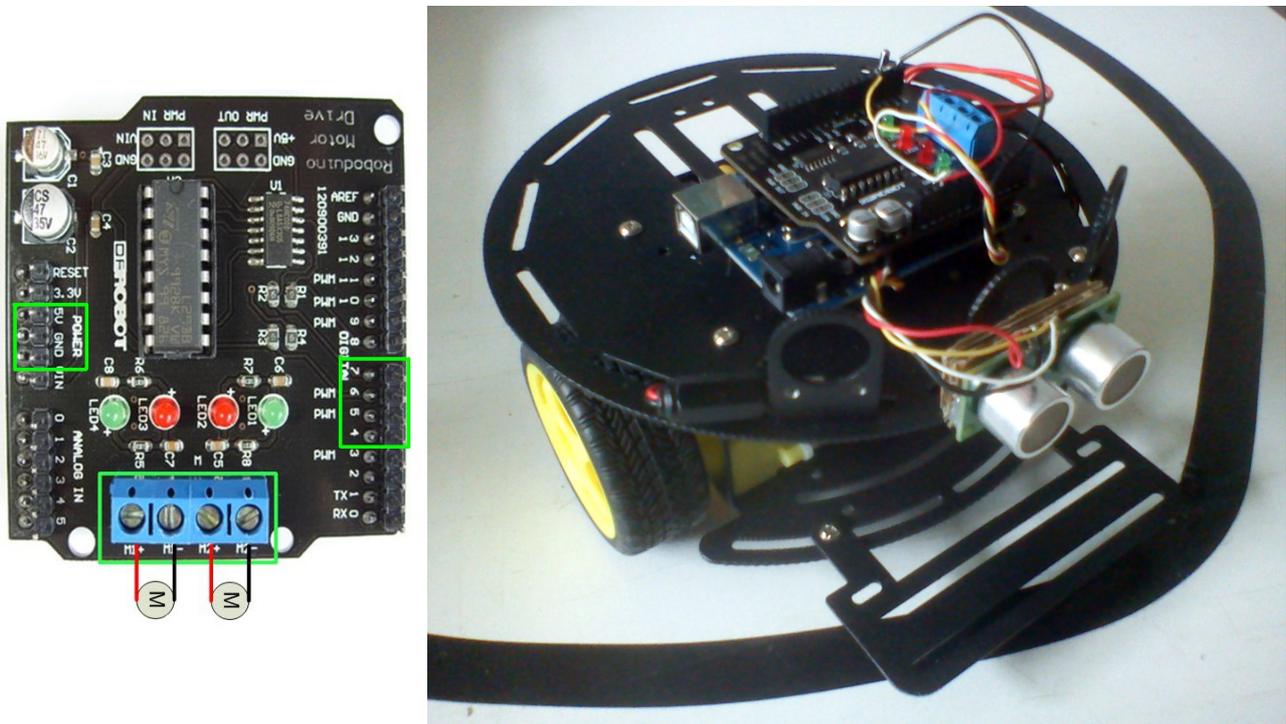


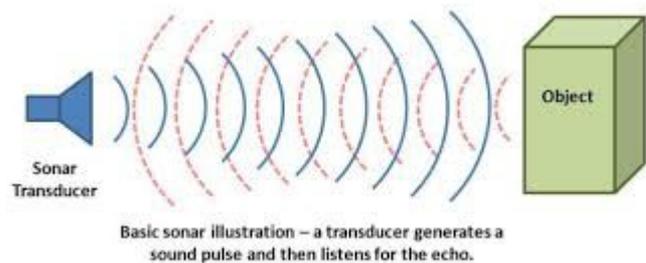
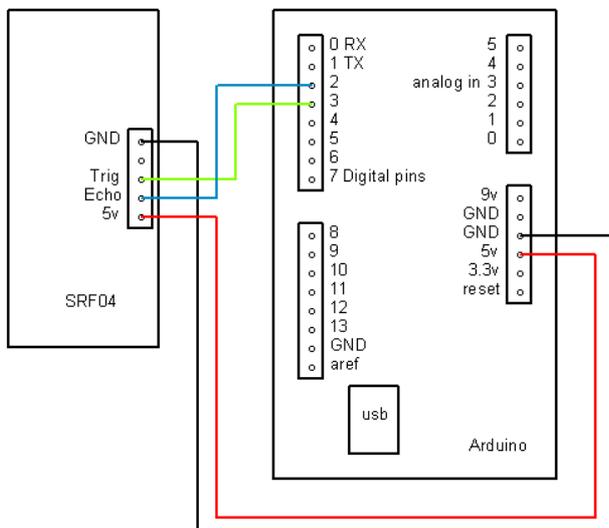
ROBOTICS WITH ARDUINO II

3) A MORE COMMERCIAL ALTERNATIVE

On first chapter of this tutorial it was mentioned the possibility to use a commercial driver to move motors in our robotics projects. Now we go to discover how to program using Ardublock a DFRobot kit which includes a complete mobile platform, an Arduino board, an ultrasonic sensor of distance and a DFRobot driver shield. In this image we can distinguish the diferents pins that the driver needs from the Arduino board as inputs and to power itself.



The driver is basically composed by an integrated circuit named L298N, usually used in robotics projects on the web, easy to program but too complicated to connect to the board except if you buy a commercial shield. It needs to work a combination of four signals from the output pins of the Arduino moving in different sense the two motors of our kit. Our driver uses the pins numbers 5 and 6 to put each motor ON or OFF, and the pins 7 and 4 to decide its turn sense. For example, if we put all outputs HIGH, the robot moves forwards and, on the contrary sense, if we put 5, 6 HIGH and 7, 4 LOW it moves backwards. To turn to left or ritgh we can combine LOW and HIGH only in 7 and 4 pins, and finally with all of them LOW it stops.



A lot of robotic projects are made to change the turn sense of motors after detect some signal from an distance ultrasonic sensor which *generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.*

The most standard and cheap of them to buy on the web could be the SFR05 which has four wires to be connected to the Arduino: 5V, GND, Trigger (on pin 3) and Echo (on pin 2). We can see how to put in order this wires in the image above this text.

The microcontroller of the board converts the signal from the sensor in a digital value between 0 and 255 and we need to indicate this value in our Arduino program. Normally program an ultrasonic sensor with code text it's not so easy but ArduBlock includes a specific block to do it possible moving a simple visual block in our screen. This program is a simple example about how to move our robot forward when the sensor detects an object (our hand) and it moves doing circles when it doesn't detect anything.



```
void setup ()
{
  digitalWrite( 3 , LOW );

  pinMode( 4 , OUTPUT);
  pinMode( 7 , OUTPUT);
  pinMode( 6 , OUTPUT);
  pinMode( 5 , OUTPUT);
}

void loop()
{
  if ( ( ( ardublockUltrasonicSensorCodeAutoGeneratedReturnCM( 3 , 2 ) ) < ( 20 ) ) )
  {
    digitalWrite( 5 , HIGH );
    digitalWrite( 6 , HIGH );
    digitalWrite( 7 , HIGH );
    digitalWrite( 4 , HIGH );
  }
  else
  {
    digitalWrite( 5 , HIGH );
    digitalWrite( 6 , HIGH );
    digitalWrite( 7 , LOW );
    digitalWrite( 4 , HIGH );
  }
}
```