

17<sup>th</sup> November

# ARDUINO PROJECT: BETTY

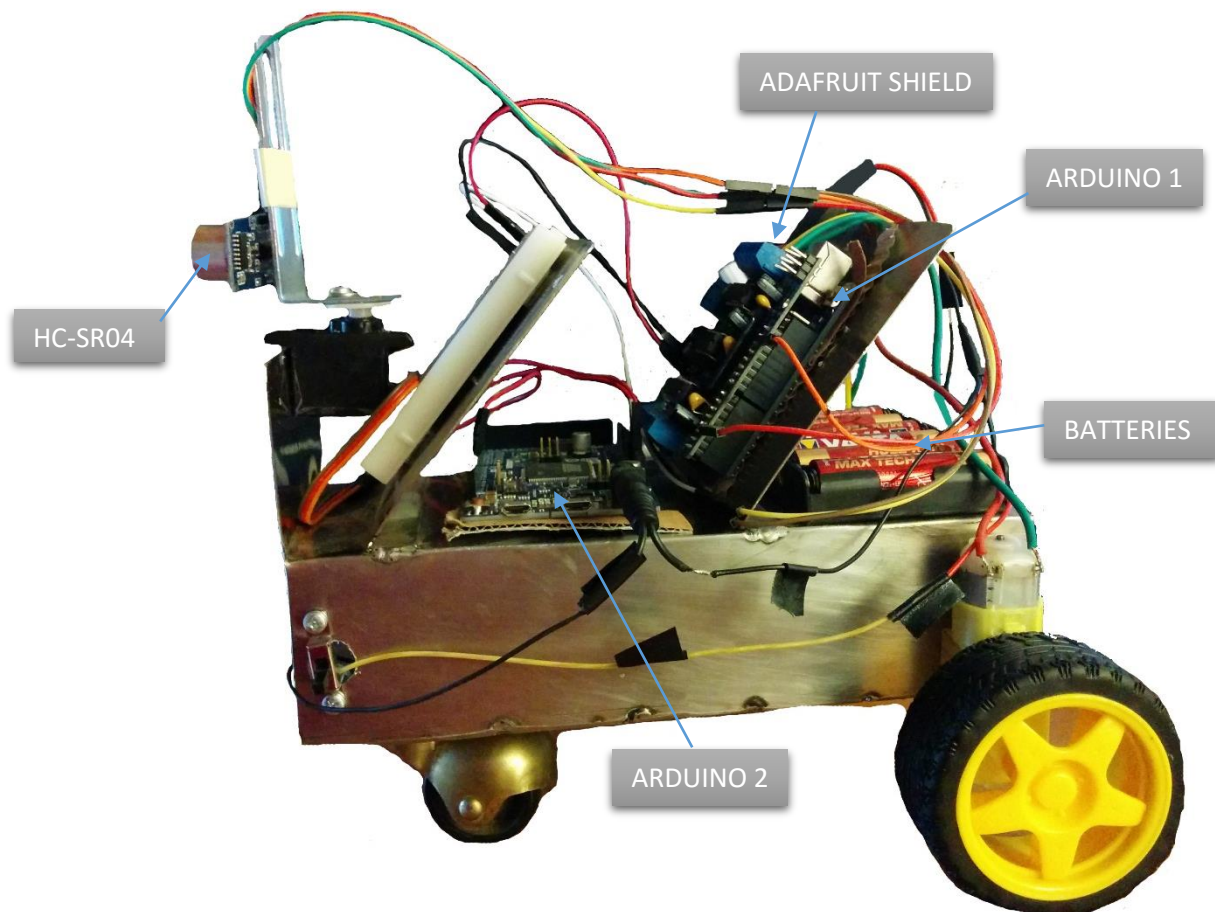


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“Betty” is my first project made up with Arduino. Betty can run and avoid obstacles.



## - The Robot

The skeleton was built by my grandfather and the rest, including holes, by myself. In the front we can find a HC-SR04 ultrasound sensor that allows the robot to calculate the distance between the obstacle. This sensor is connected to the first Arduino board, which is the “Arduino Uno” one. I surmounted this board with an Adafruit Motor Shield (the model that can control and power two stepper motors or four DC motors in the meanwhile) because I’ve to control two DC motors collocated in the sides of the box. There’s also another one Arduino Board, the “Arduino Due” used for allow to the servo that sustain the ultrasound to rotate and increase the range of the sensor (in fact, in the first version, the robot wasn’t able to find obstacle only if he was at 90 degree to it). All the machine is powered by a 9V battery situated in the back, there’s also a switching on/off system. In the latest version I’ve also installed an impact attenuator to keep the structure and the components safe.

## - The Sketch

```
#include <AFMotor.h> //define the motorshield library

//motors definition
AF_DCMotor motore1(1, MOTOR12_1KHZ); //define first motor
AF_DCMotor motore2(2, MOTOR12_1KHZ); //define second motor

//ultrasound definition
int trigger = 2; //define trigger pin
int echo = 13 ; //define echo pin
long duration = pulseIn(echo, HIGH);
long r = 0.034 * duration / 2; //distance in cm

void setup() {

motore1.setSpeed(255); //set motore1 speed 0-255
motore2.setSpeed(255); //set motore2 speed 0-255

//ultrasound setup
pinMode(trigger, OUTPUT);
pinMode(echo, INPUT);
}

void loop() {

motore1.run(BACKWARD); //go forward
motore2.run(FORWARD);

while (r <= 8){ //while the distance is lower than 8cm
digitalWrite(trigger, LOW);
delayMicroseconds(5); //to ensure a clean HIGH pulse
digitalWrite(trigger, HIGH); //send the pulse
delayMicroseconds(10);
digitalWrite(echo, LOW); //read the pulse

if( r <= 3){ //if you're near an object
motore1.run(RELEASE); //stop the motors
motore2.run(RELEASE);
delay(500);
motore1.run(FORWARD); //go backward..
motore2.run(BACKWARD);
delay(1000); //for 1 second
motore1.run(RELEASE); //stop the motors
motore2.run(RELEASE);
delay(500);
motore1.run(FORWARD); //turn left for 6,66 seconds
motore2.run(FORWARD);
delay(666);
motore1.run(BACKWARD); //go forward
motore2.run(FORWARD);
}
}
}
```

