

Intermediate Project Final report

Bluetooth Car control Accelerometer

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Abstract:

Goals:

Main task of the project was to develop an algorithm in Android Studio and create Bluetooth Car. Special program wrote in AS allows remote control robot. Next step was to develop all electronics control two DC motors and Bluetooth. To achieve this task library Arduino was used on the software part.

Assumption:

The application should connect two objects: a smartphone and robot, using Bluetooth transmission. The smartphone should coordinate robot. The program should be robust, shakes hands should have no impact on the work program.

Results:

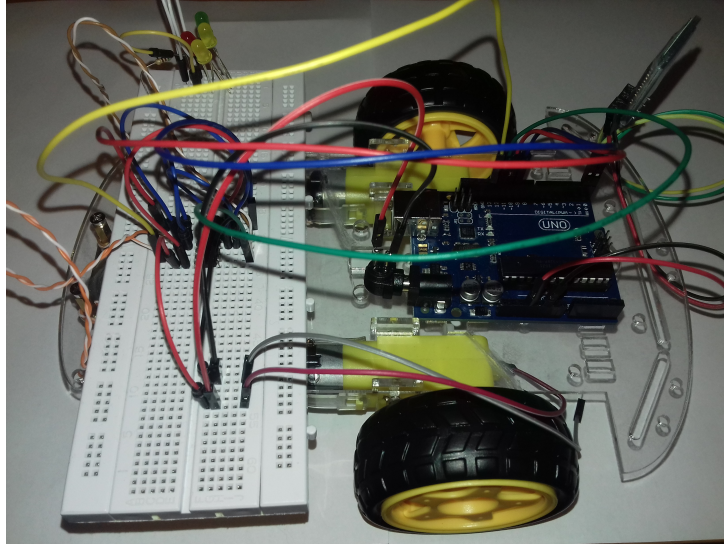
The high sensitivity of the program allowed accurately control the robot. Bluetooth perfectly suited to control the robot, but it has several drawbacks. BT transmission is so very slowly and for long distance this kind communication is not suitable. Kit Arduino is ideal to create fast robots.

1 Introduction

1.1 Physical model

Physical model of Bluetooth Car was designed and constructed. Image 1 shows the mobile platform. It consists of:

- 2 x DC motors
- Mobile platform 2WD.
- Arduino UNO

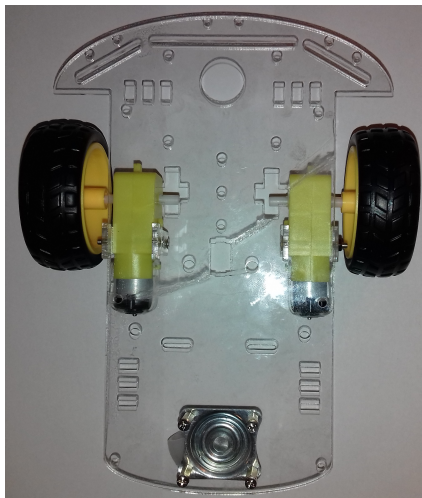


(a) Figure 1

Figure 1: Show Bluetooth Car with electronics.

1.2 Platform and DC motors.

The versatile platform allows the construction of 2-wheeled robot. In the case of construction of any mobile robot to just mechanics it is usually the biggest challenge. The platform has a number of mounting holes for connecting controller Arduino. The platform is equipped with 2 motors with gearbox. Floor plate is made of acrylic glass.



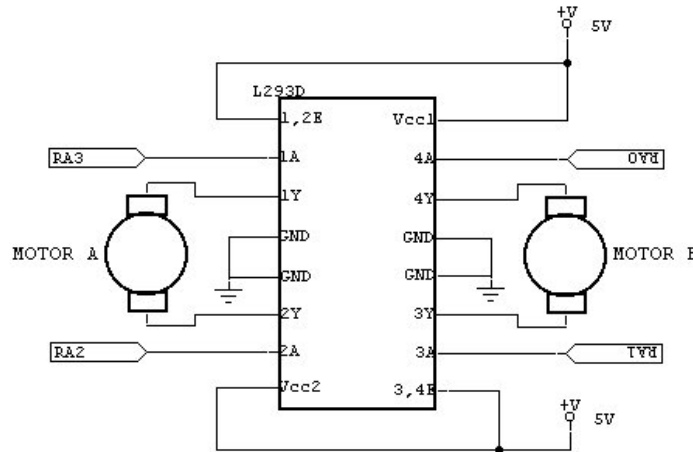
(a) Figure 2

Figure 2: Show Platform and DC motors.

- Gear motors: 1:48
- Wheel dimensions: 6.5 x 2,7cm
- Chassis dimensions: 22 x 12cm

1.3 Integrated circuit - L293D (control motors)

Two-channel motor driver. The supply voltage to 36 V. Average current per channel 600 mA (instantaneous to 1.2 A). Case: DIP-16 (threaded up).



(a) Figure 4

Figure 3: Show DC controller.

Integrated circuit L293D controller driver responsible for the speed and direction of rotation.

1.4 Bluetooth HC-06

A simple communication system based on Bluetooth module HC-06 v2.0 + EDR. It communicates through a serial UART interface using AT commands.



(a) Figure 4

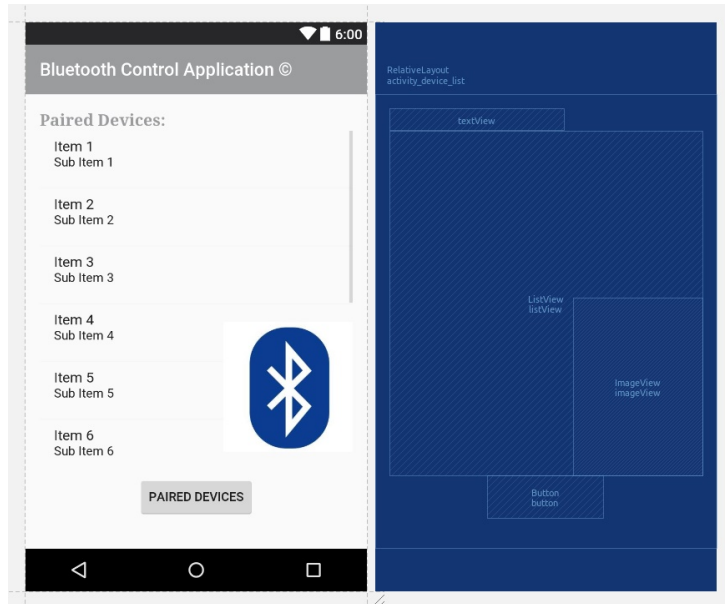
Figure 4: Bluetooth HC-06r.

To start the module, connect the power supply to pin labeled VCC. The module is detected by a smartphone as an unknown system or HC-06 to pair both devices must enter the password 1234.

2 Android Studio

2.1 Paired devices

Android Studio provides the fastest tools for building apps on every type of Android device. World-class code editing, debugging, performance tooling, a flexible build system, and an instant build/deploy system all allow building app.

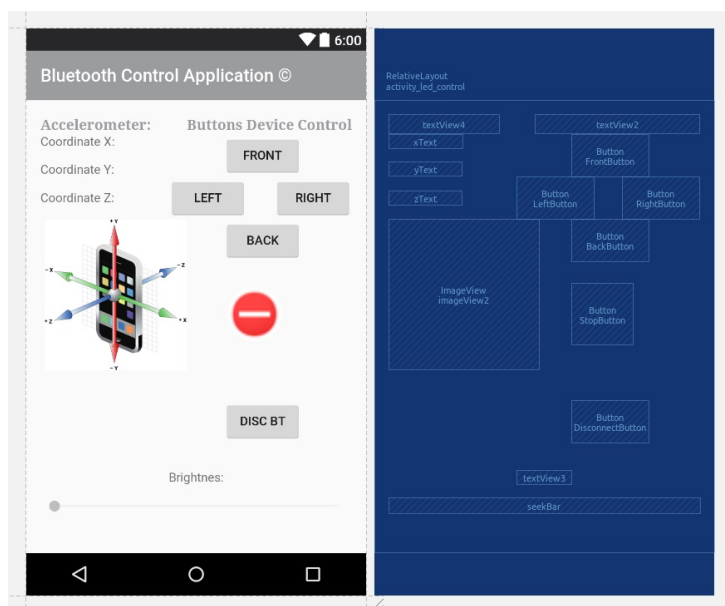


(a) Figure 5

Figure 5: Show one of windows created in Android Apps.

This window's app is responsible for finding Bluetooth devices. Device found by mobile phone is showing on the screen. One touch screen connects with Car.

2.2 Device control



(a) Figure 5

Figure 6: Show one of windows created in Android Apps.

That part application is dedicated to controlling Car. In the window, the user can control use two

types control robots. First type by buttons, and second by Accelerometer. The value of accelerometer is showing in real time on the touchscreen.

3 Conclusions

Aim of the project was achieved. Control of the vehicle using the accelerometer. Bluetooth transmission has long delays, you can see it for control. Transmission is slowed when you steer using the accelerometer. The accelerometer built into the phone is very accurate and sensitive.