

# Arduino Robot Car controlled by Android App

## Introduction

This project consists of creating an Android application, which controls an Arduino Robot Car. Although this idea might seem overused in the regular Arduino projects, I wanted to try it on my own and create my own robot car.

My project contains two main different parts: implementing the software - designing the Arduino code and the android application and implementing the hardware - setting up the car and gathering all the necessary equipment.

## Project objectives

The main objective of this project is to create an Arduino Robot car, which will be controlled through a phone application. The main thing that I want to obtain from this project is to learn more about how Arduino works and how to combine physically building a car with writing the code necessary to control it. I plan to deeply understand the concepts of Arduino and be able implement the code on my own.

I promise to attempt to design an Arduino controlled car, which contains a few different sensors, such as a proximity sensor and to develop the code on my own – I will have to look at other already developed codes in order to understand the way it works, but I promise I will implement it on my own. I also want to ensure the fact that I will set up the car and add the mentioned components to it. In addition, I will try to make the robot car move until the deadline.

I do not promise that the code will have no bugs, or that the finished product will work perfectly, as I am only beginning to explore Arduino. I will not assure that the phone application will have no errors and I cannot guarantee the efficiency of the code. I apologize that I will probably have to modify a few of the things I mention at the beginning of the project, as I cannot know what difficulties I might encounter while developing this project.

## Task Analysis

The project imposes a few tasks, which are split into two different parts:

### 1. The software part

I plan to develop an Android application containing a single layout, which will possess a few buttons that control the direction of the car.

I will also design the Arduino code which when receiving the information from the phone application, will further tell the robot what to do.

## 2. The hardware part

The hardware is composed of the necessary electronic devices, which will help me build the car.

### Design

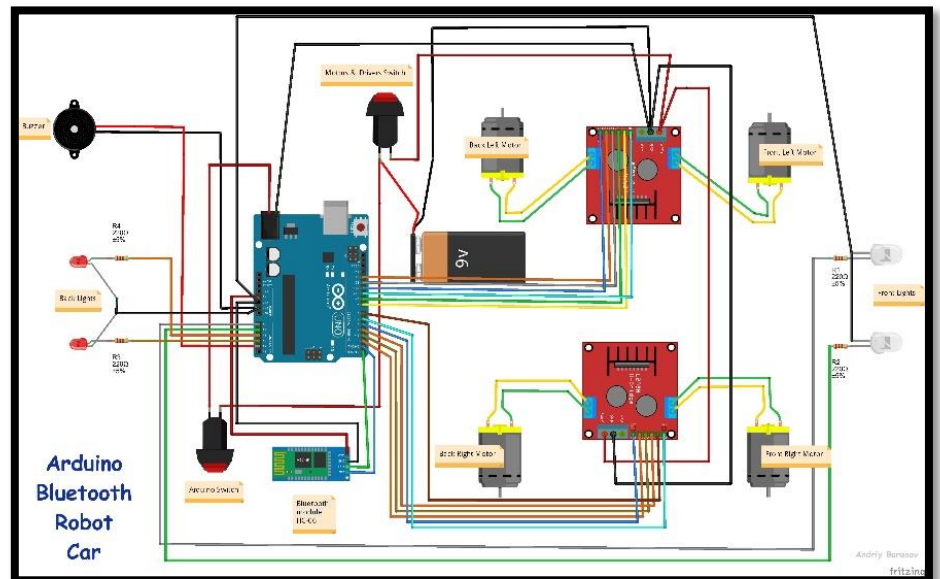
Because the project is structured in the hardware and software parts, I will show in two images the approximate representation of the design.

I want to mention that these images are only to have a visual idea of how the project parts will look like. The actual design might be different of the one shown in the pictures because I have not purchased all the hardware items yet, and I did not begin developing the android application.

The hardware part:

Necessary equipment:

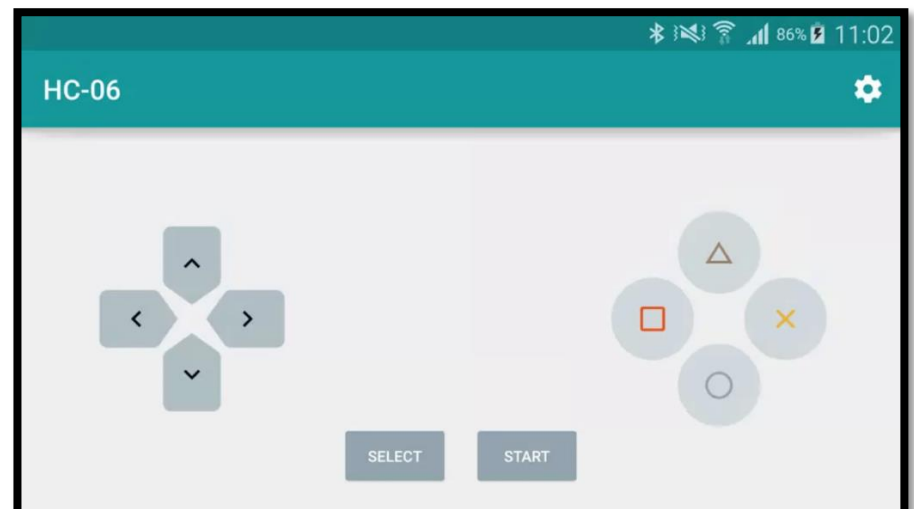
- Arduino UNO/MEGA
- Bluetooth module
- Motor driver
- LEDs
- Resistor
- DC Motors
- Batteries
- Proximity Sensor



The layout of the android application:

The UI will be very simple, as I am a beginner in writing android applications.

In this stage of the project development, I plan to have a few buttons. In case of successfully implementing these, I will add more components to the User Interface.



## **Implementation**

The implementation part consists of attempting to apply the design ideas.

In the hardware part, I will assemble the Arduino robot car. I will attach the motor driver to the Arduino board and connect the dc motors to it. I will attach the Bluetooth module and the LEDs. Finally, I will provide power supply through basic 1.5-volt batteries.

In the software part, I will write the Arduino code for controlling the car. There are some special Arduino instructions, which I will explore in the following weeks. After developing the android application, it will communicate with the Arduino, and once the user presses the button, the car will start moving in the wanted direction.

## **Project Plan**

October 14 - 20	<b>Create the project plan and find documents about the project.</b>
October 21 - 27	<b>Purchase all the necessary equipment for the project and install the IDEs.</b>
October 28 - November 3	<b>Understand how Android Studio and Arduino IDE works. Fixing the details regarding the project design.</b>
November 4 - 10	<b>Start working on the Android app by adding components one by one. Firstly, I plan to add a simple button and connect it to Arduino. I will also try assembling the car.</b>
November 11 - 17	<b>I will continue with the implementation, add more buttons and finish assembling the car.</b>
November 18 - 24	<b>Finish the layout of the android application.</b>
November 25- December 1	<b>Try to add the proximity sensor and the LEDs. Add the necessary Arduino code in order to control them through the phone application.</b>
December 2 - 8	<b>Test the app.</b>
December 16 - 22	<b>Continue with testing.</b>
January 6 - 12	<b>Ensure that the project works and modify it in order to meet the project requirements if needed.</b>

## Testing

Testing is not a separate part of the project presentation, because it will be needed at every step. From the moment, the project starts until the last part of the project I will individually test every improvement and component I decide to add. In the project documentation, I will show the results to the tests.

## Conclusions

In conclusion, this project represents Arduino controlled robot car, and the necessary steps needed in order to finalize the project. I believe that creating my own robot car will improve my creativity and will help me work independently in gathering information and further applying it.

## References

<https://create.arduino.cc/projecthub/platinum/android-apps-controlled-arduino-robot-car-8c39c4>

[https://www.google.com/search?q=user+interface+for+android+app+for+arduino+car&sxsrf=ACYBGNSwwdaMvVTyNOKIKRMacuMu90CgKg:1571674916291&source=Inms&tbm=isch&sa=X&ved=0ahUKEwjhytmo4a3IAhXhoosKHbRcAM4Q\\_AUIEigB&biw=767&bih=659#imgrc=b3PqPPxw4DWYCM:](https://www.google.com/search?q=user+interface+for+android+app+for+arduino+car&sxsrf=ACYBGNSwwdaMvVTyNOKIKRMacuMu90CgKg:1571674916291&source=Inms&tbm=isch&sa=X&ved=0ahUKEwjhytmo4a3IAhXhoosKHbRcAM4Q_AUIEigB&biw=767&bih=659#imgrc=b3PqPPxw4DWYCM:)

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<https://www.electricaleasy.com/2014/01/basic-working-of-dc-motor.html>