# Toy Car Using Raspberry Pi,Bluetooth & Arduino

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*Abstract*–A Toycar is controlled using a keyboard and bluetooth where the keyboard is connected to a raspberry pi.

## 1 Hardware Setup

1) Assemble the motors,chassis and wheels to build the toycar.
2) Stick the breadboard to the chassis of the toycar.
3) Stick a 9V battery to the breadboard and connect the positive and negative terminals to extreme ends of the breadboard.
4) Stick a 9V battery to the breadboard and connect the positive and negative terminals to extreme ends of the breadboard.
5) Provide 9V to the supply pin of the Arduino.
6) Plug the L293D motor driver IC in Fig. 1 on the breadboard.

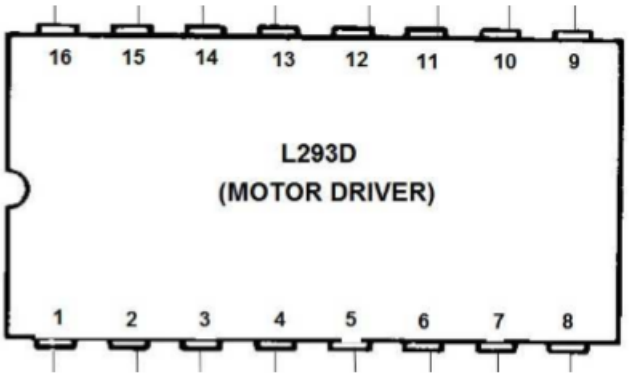


Fig. 1: Pin out of L293D

7) Connect the L293D pins according to Fig.3.

## 2 Setting up Arduino and Bluetooth module

1) Connect the HC05 pins i.e., bluetooth module pins according to Fig.2.

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| **Power** | **L293D** | | | |
|---|---|---|---|---|
| 9V | 1 | 8 | 9 | 16 |
| GND | 4 | 5 | 12 | 13 |

| **Arduino** | D2 | D3 | D4 | D5 |
|---|---|---|---|---|
| **L293D** | 2 | 7 | 10 | 15 |

| **Motor** | **+** | | **-** | |
|---|---|---|---|---|
| **L293D** | 3 | 11 | 6 | 14 |

Fig. 2: Arduino to L293D connection

| **Arduino** | D0 | D1 | 5V | GND |
|---|---|---|---|---|
| **HC05** | TX | RX | Vcc | GND |

Fig. 3: Arduino to bluetooth connection

2) Dump the following code in Arduino using its IDE.

```
wget https://raw.githubusercontent.
com/gadepall/EE1390/master/bot/
codes/vcb.cpp
```

3) The HC-05 bluetooth module looks as shown in the figure

## 3 Configuring Bluetooth of PI

1) The following commands will install graphical interface for the bluetooth of the Pi

```
sudo apt-get update
sudo apt-get install bluetooth bluez
blueman
sudo reboot
```

2) After rebooting the pi,under the menu option scroll down to preferences and click

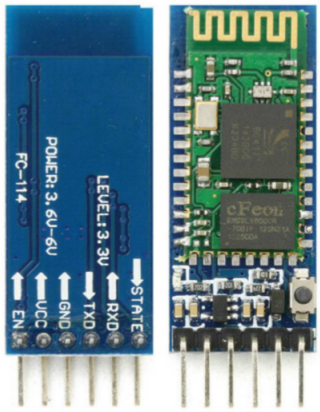


Fig. 4: HC-05 Bluetooth Module

textbfBluetooth Manager.From there, connect to bluetooth device that is connected to the arduino.

3) The snap shot of the bluetooth settings in raspberry pi looks as shown in the figure Fig. 4.

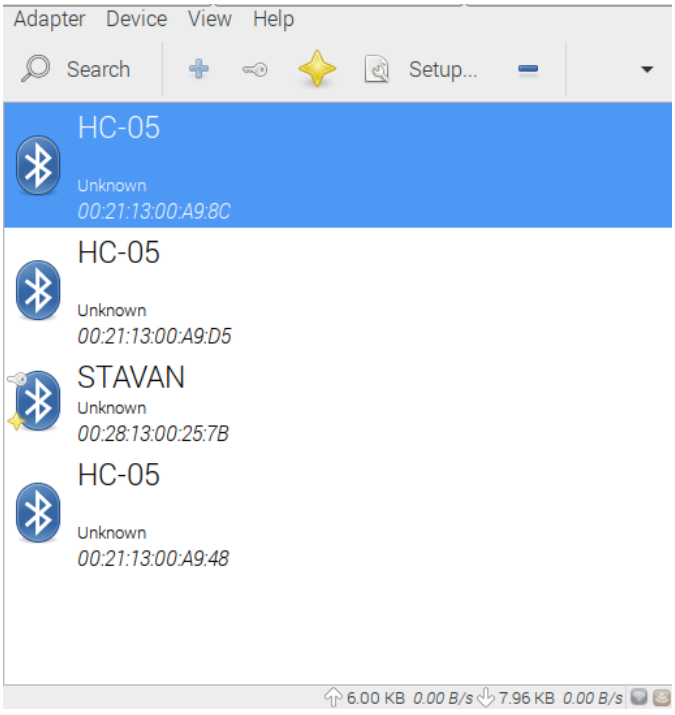


Fig. 5: Bluetooth settings in raspberry pi

## 4 Implementation

a) Save the following code in a file called bluetooth.py .

```
wget https://raw.githubusercontent.com/gadepa
```

b) Run the program using following command.

```
python bluetooth.py
```

c) The num keypad on the keyboard is used to control the toy car.
The controls are shown in the Table 0.

| Number | direction |
|---|---|
| 8 | Forward |
| 2 | Back |
| 4 | Right |
| 6 | Left |
| 5 | Stop |

TABLE 0: Keyboard controls

## 5 Explanation

Raspberry Pi and the bluetooth devices are connected to send/recieve the information through serial communication
As keyboard is used to control the toy car, serial information is sent from the raspberry pi to HC-05 bluetooth device.To send the information from raspberry pi we implemented a python code where we used a function called serial.Serial with necessary baud rate.
The function getch() is used to take continous input from the user without pressing enter key.