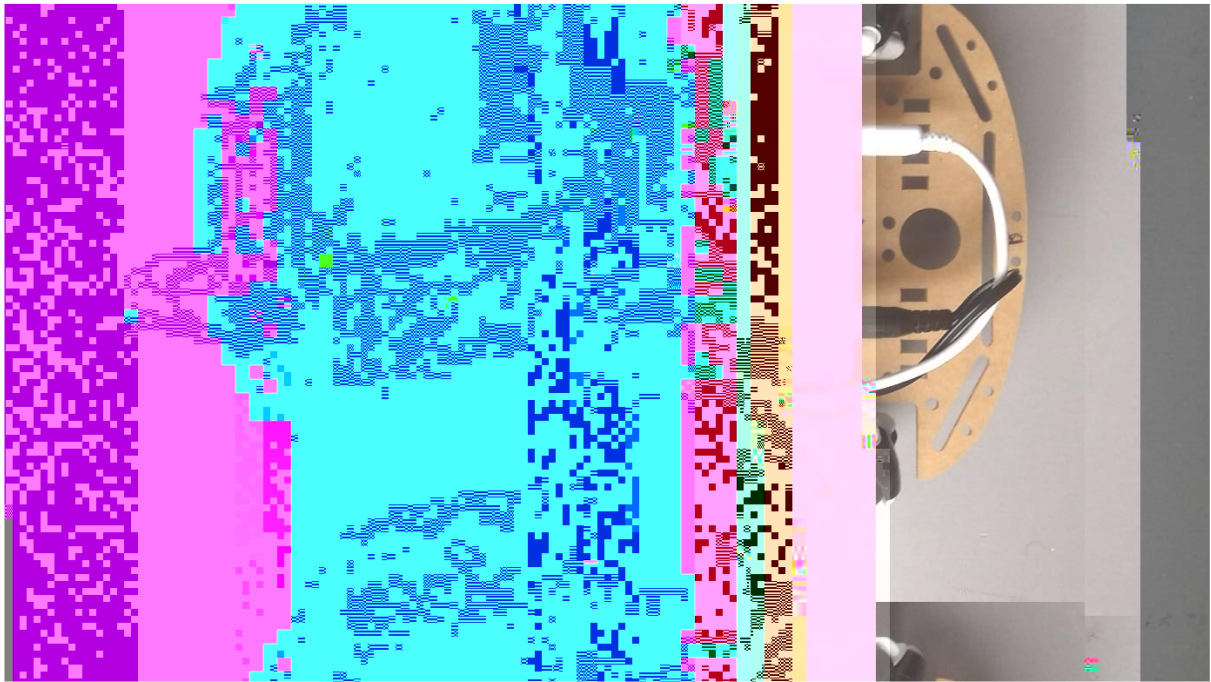


Raspberry Pi Zero Bluetooth Robot Car



An Elementary Guide to Building a Simple Robot Car

By

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Fix your motors in this fashion to a chassis of your choice, this could be a blank piece of Perspex, or even an old wooden cigar box. Number your motors 1 to 4, as these will be connected to the

Raspberry Pi Zero Bluetooth Robot Car

5. Initial testing

An initial test is required to ensure that all the motors are connected correctly, and more importantly that they all turn in the correct direction as dictated by the program.

Before using the battery, ensure that it is fully charged. It is possible to use other batteries as a power source, but this particular battery has 2 convenient power outlets to power the RPZ and motors separately.

Making sure that the MotoZero power lead (DC5521 9-12v) is plugged into the Talentcell battery, and that the Mecanum wheels are **not** fitted to each motor, place the robot car on to a flat surface with the motors downwards i.e. battery and RPZ upwards.

Connect the RPZ micro suorr G[(b)27(l)-12 1 112.32 6168 661.67 Tm0 g0 G[(())] TETQq0.000008869 0 595.2 841.8 r

Raspberry Pi Zero Bluetooth Robot Car

```
def shiftl():                                # Crab left
    print("Shift Left")
    m1.backward(speed)
    m2.forward(speed)
    m3.forward(speed)
    m4.backward(speed)
```


Raspberry Pi Zero Bluetooth Robot Car

7. Setting up the Blue Dot on Android

Download and install Blue Dot onto the Android device.

The android will **not connect** with the RPZ **until** the main program is run. This can either be done via a Mobile VNC or SSH app, or VNC/SSH from a laptop or desktop PC.

When running, the Blue Dot controls will look like this on the android screen :-

RED	=	Forward, Backward, Left or Right
YELLOW	=	Shift Left or Right (crab L/R)
GREEN	=	Slide Left or Right (diagonal forward L/R)
BLACK	=	Pause
BLUE	=	Quit
WHITE	=	Not activated

These controls and colours can be changed within the python program.

(NB: At time of writing, it was not possible to place text into the various circles)

8. Fitting the Mecanum Wheels

Having made sure that all the motors run in the correct

Raspberry Pi Zero Bluetooth Robot Car

Using diagram a) as a guide, and ensuring that the forward motion of the motors is in the direction of , (as if looking down on the robot car), place the wheels onto each motor so that the angle of the rollers is the same as indicated in the diagram.

The remaining diagrams b) to f) show the effect of robot car movement depending on the direction of the individual motor indicated by the blue arrow (NB: not all are used in this project).

9. Sequence of Operation

- Ø Plug in power to RPZ and MotoZero and turn on Robot Car
- Ø Place Robot Car on level surface away from obstacles.
- Ø Turn on Android/Laptop/Desktop
- Ø Turn on Bluetooth on Android/Laptop/Desktop
- Ø VNC into Robot Car RPZ (may require several attempts if RPZ not ready)
- Ø Turn on RPZ Bluetooth via VNC
- Ø Locate and run main python program (program will wait for event)
- Ø Activate Blue Dot app on Android
- Ø Pair Android with RPZ (see [Pair a Raspberry Pi and Android](#))

- Ø Select connection of Android to RPZ.
- Ø (Coloured controls will now appear as per Section 7)
- Ø Practise to perfect your technique !

During operation, the L293D chips on the MotoZero can get quite hot. **DO NOT TOUCH THEM** and **DO NOT run the program at full speed for any length of time** and, avoid obstacles and rough terrain which would otherwise cause stress to the motors, and hence cause the L293D chips to overheat. Speed = 0.2 is ample !

The Mecanum wheels used in this project are plastic and can tend to slide on a wooden laminate floor, and may not turn at all on carpet, depending on the thickness of the pile. Rubber wheeled Mecanum wheels are available, and these are more effective in gripping laminate flooring (and consequently more expensive !)

Lastly, Remember to Power down the RPZ and switch off the battery when finished.

10. Design notes

This project is of course very simple, and literally held together by elastic bands ! However, with some ingenuity (and patience), a more elaborate chassis can be constructed from using a suitable sized (fir