

Robots I - Week 2

Robot Building Time

Last Week...

Last week we looked at the basics of our robot parts. Today we are going to assemble the Robot chassis and get started!

Chassis Assembly

Install the caster wheel with the screws facing down from the robot. We do this so that we can properly fit a breadboard on the top of the chassis. There are four screws and nuts that will hold the castor wheel in place.



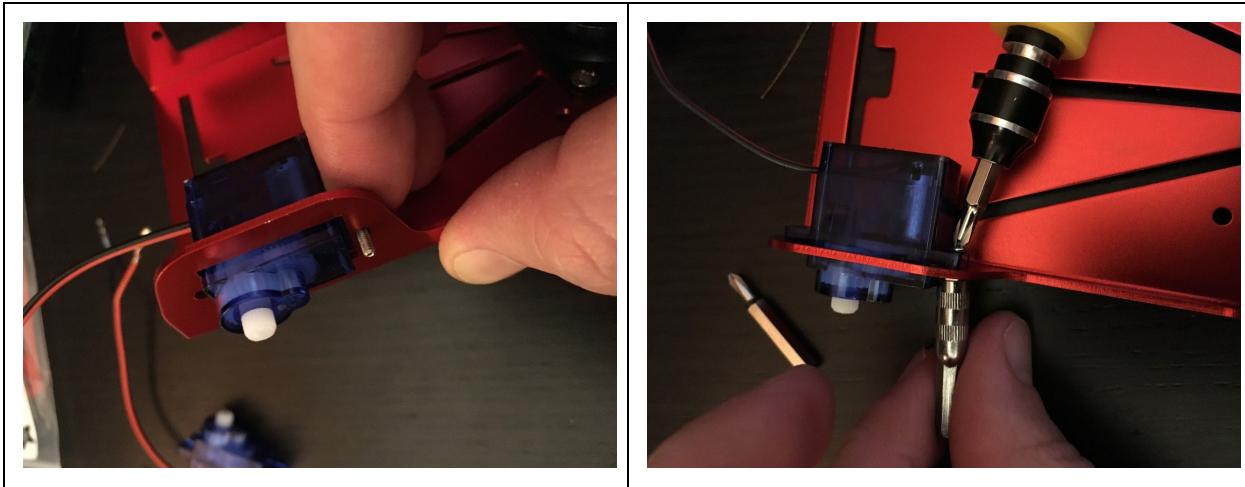
Next, we are going to install both motors. You want to fit the motor such that it is closest to the back of the robot (as pictured below):



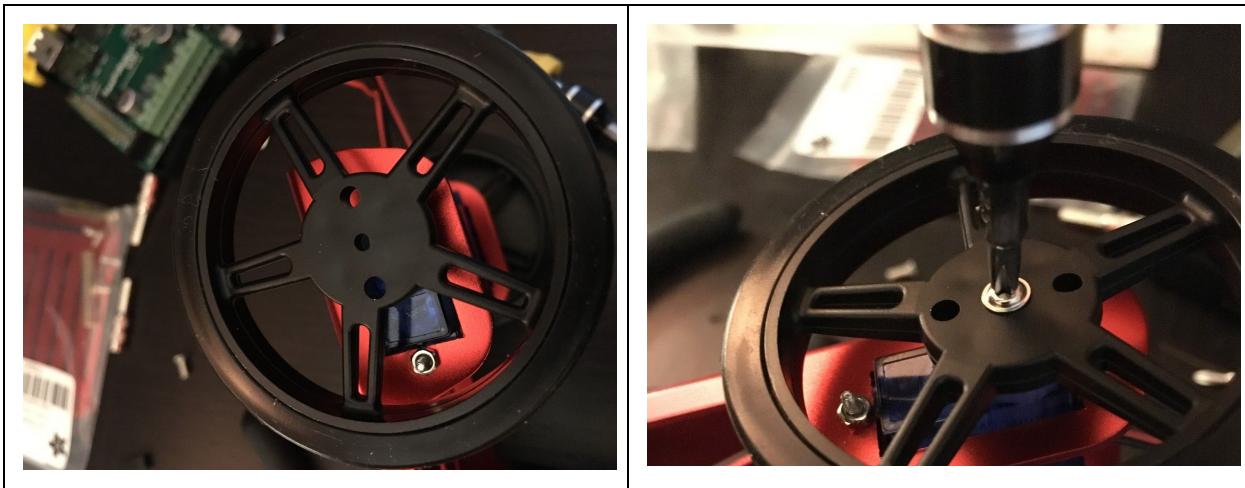
The small bag that came with each motor has two styles of screws. Two are for the motor mounts and one is for the wheel. Put the wheel screw off to the side.



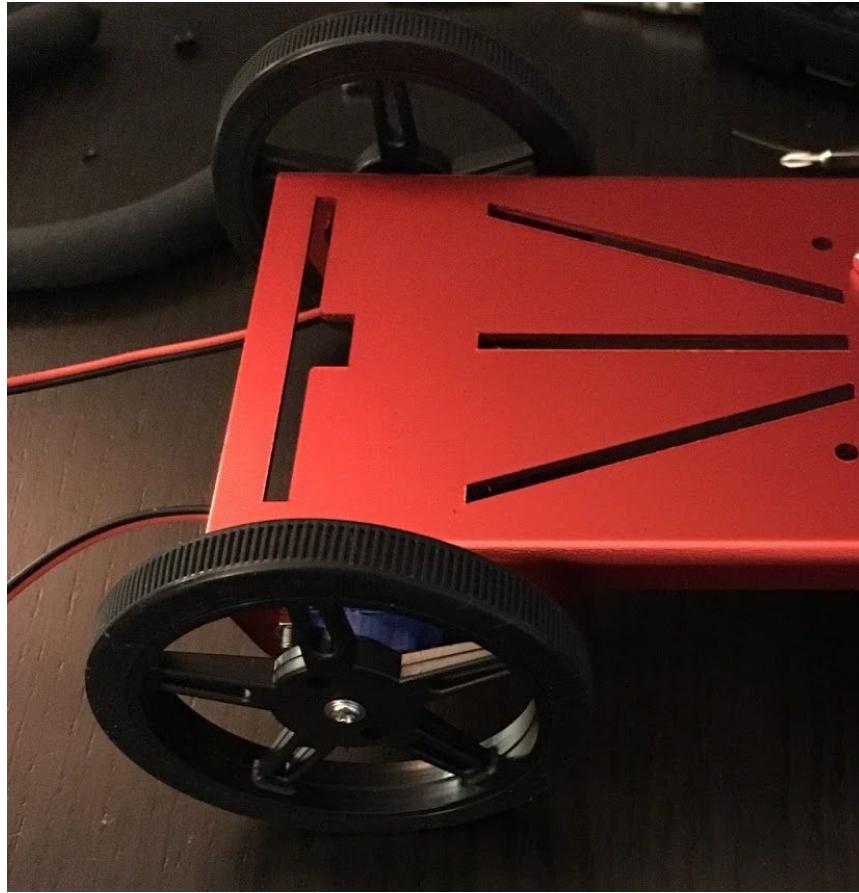
Fit one screw into place and carefully wind through the nut. To this first by hand to that the nut sits into place. Once both nuts are placed correctly, you can tighten by hand, with pliers, or an appropriately sized bit (pictured below).



Next place each wheel and add the wheel screw.



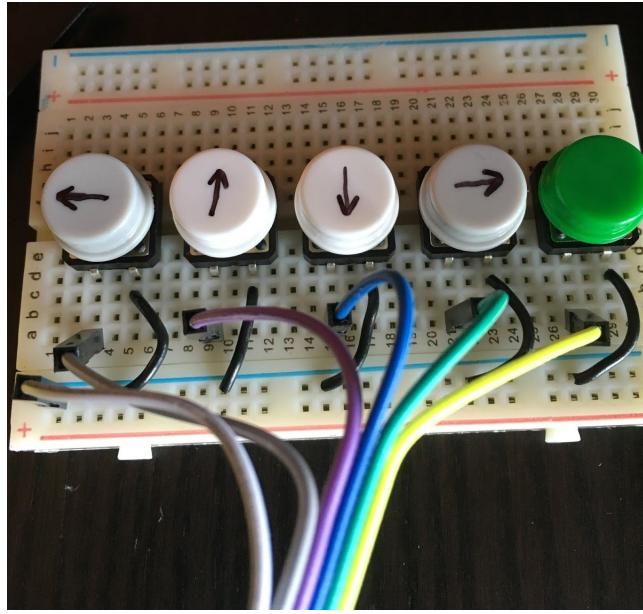
The robot chassis standing upright should look as follows:



PBRCL Board Wiring

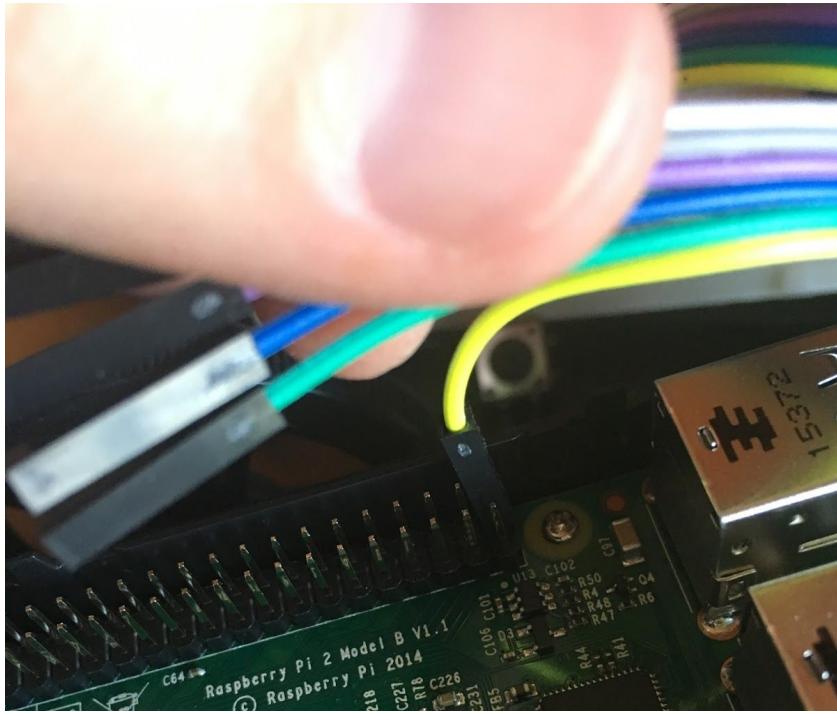
The Push Button Robot Control Language (PBRCL) provides a very easy way to program the robot without requiring a screen. This part of the setup will wire breadboard into the Raspberry Pi.

Install the wiring harness starting with the green button and moving (wire by wire) to the last button. Then, finally, wire the 6th wire to ground on the breadboard to line up with the individual small black wires that are each plugged into the blue (ground) rail.

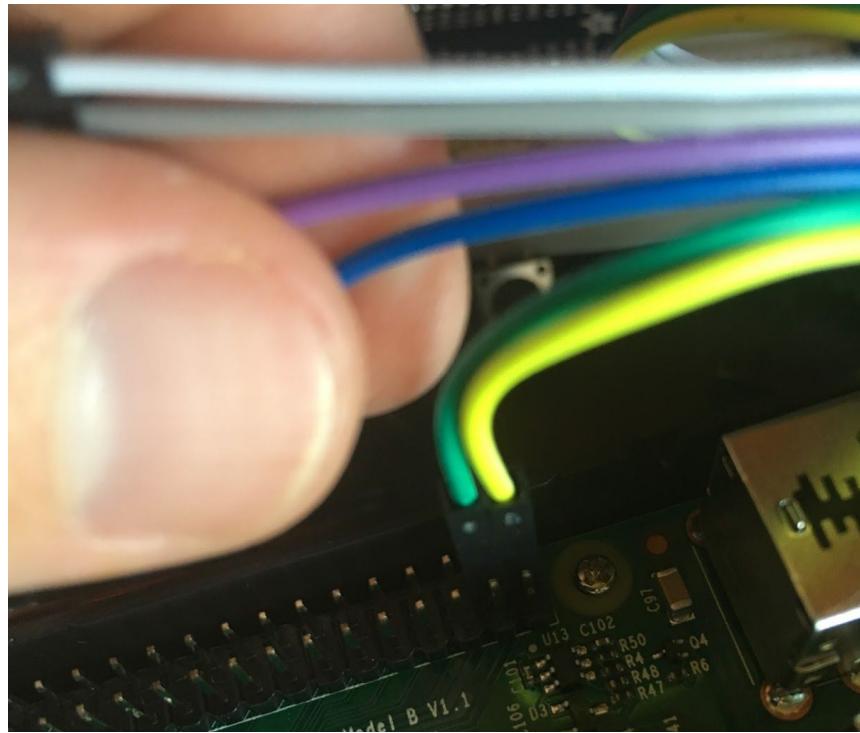


We will connect each of the other wires directly to the Raspberry Pi's GPIO pins in the following order (starting with the colored wire that is connected to the green button):

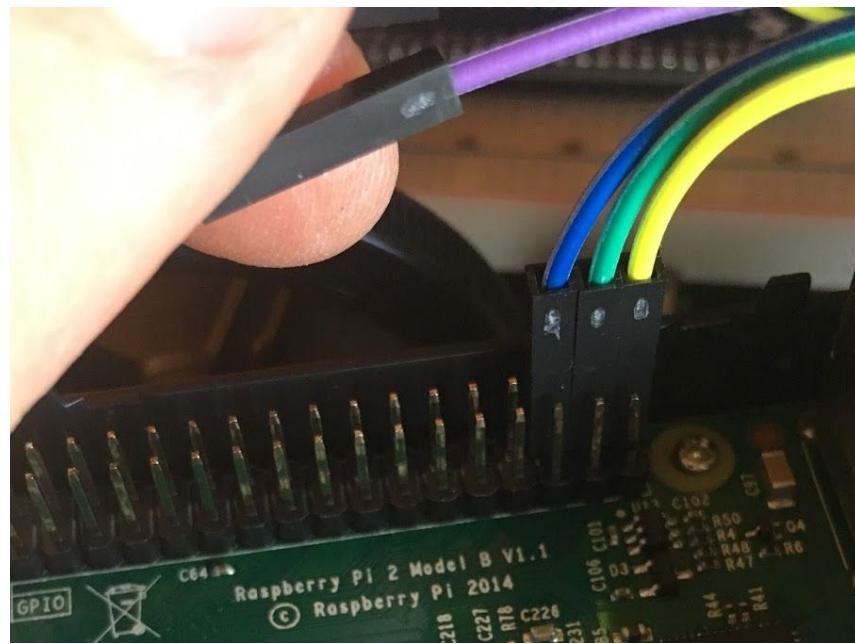
Step 1:



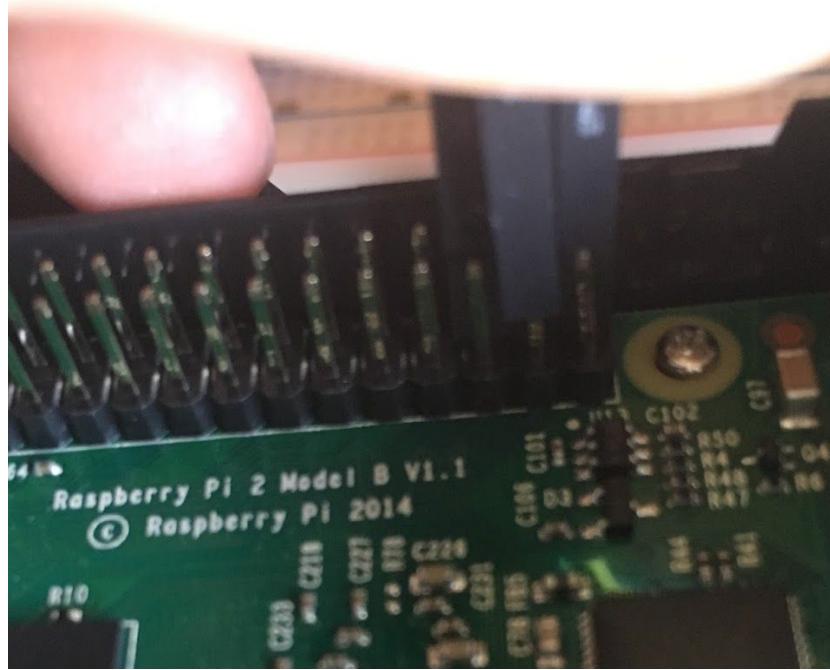
Step 2:



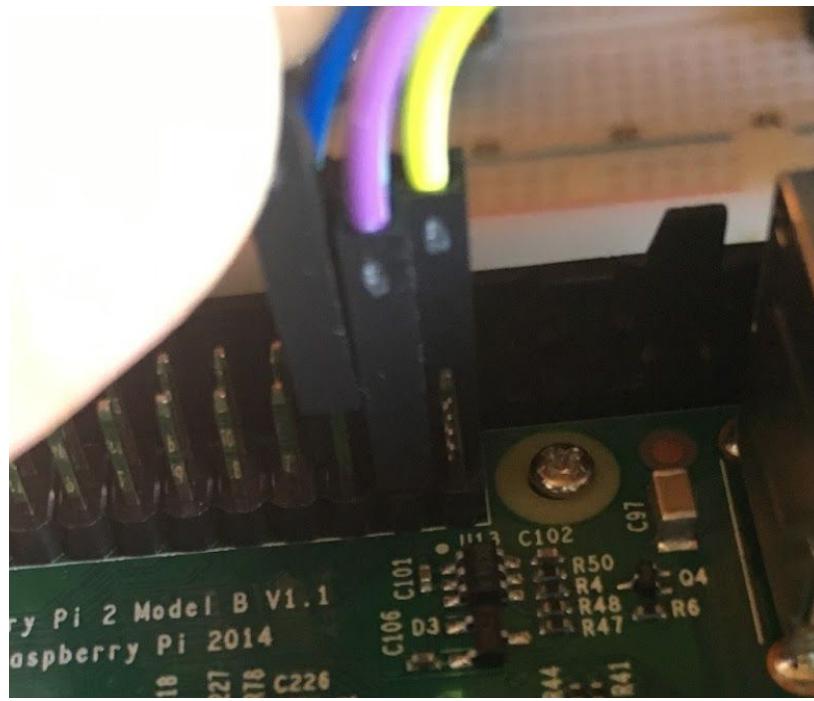
Step 3:



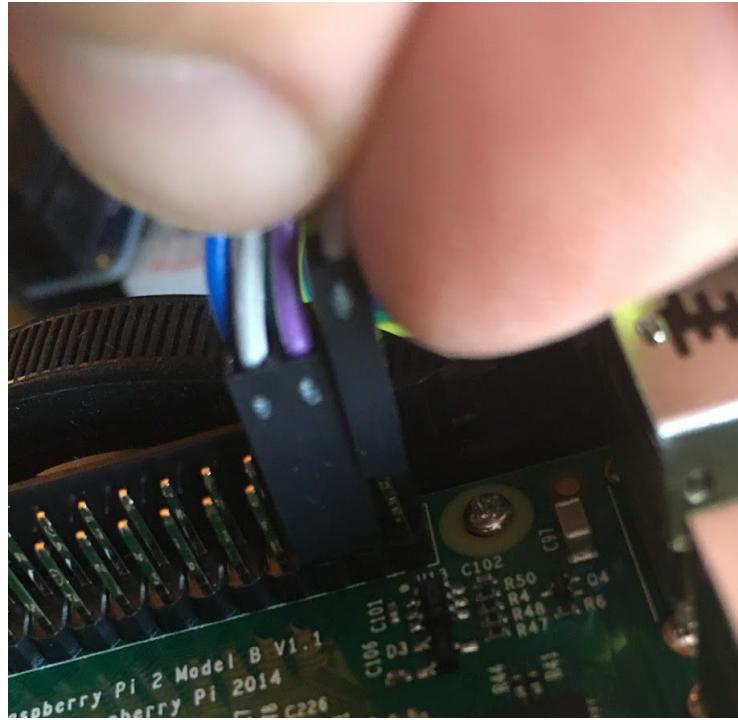
Step 4 (note where this wire goes - new row in center):



Step 5:



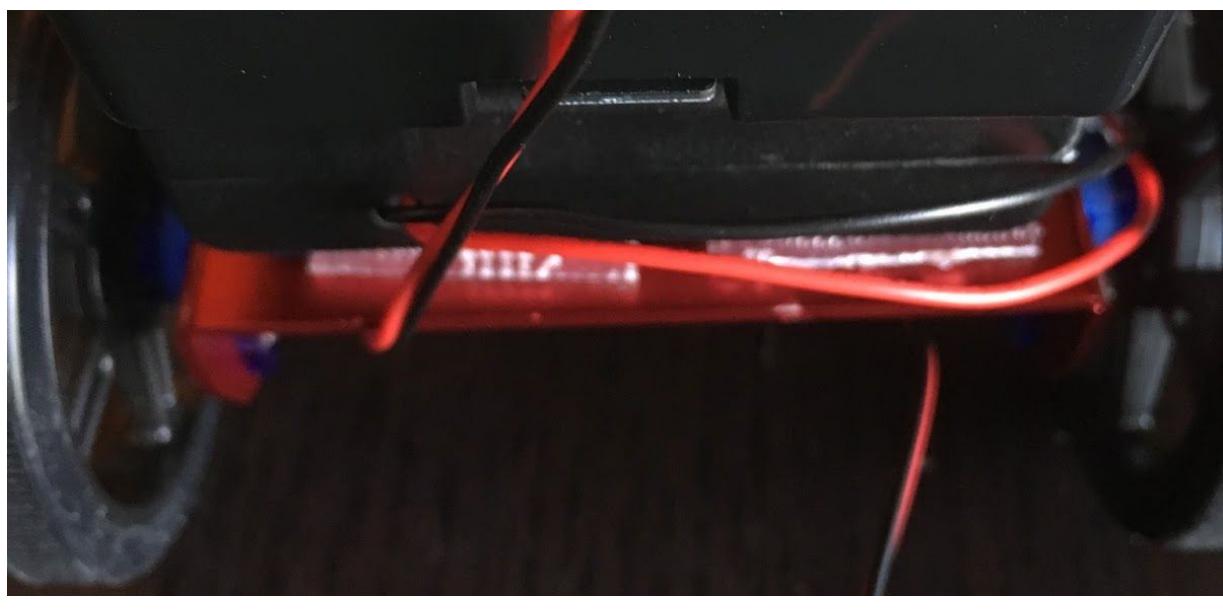
Step 6 (note the location on this one):



Ask an instructor to verify your connections before proceeding!

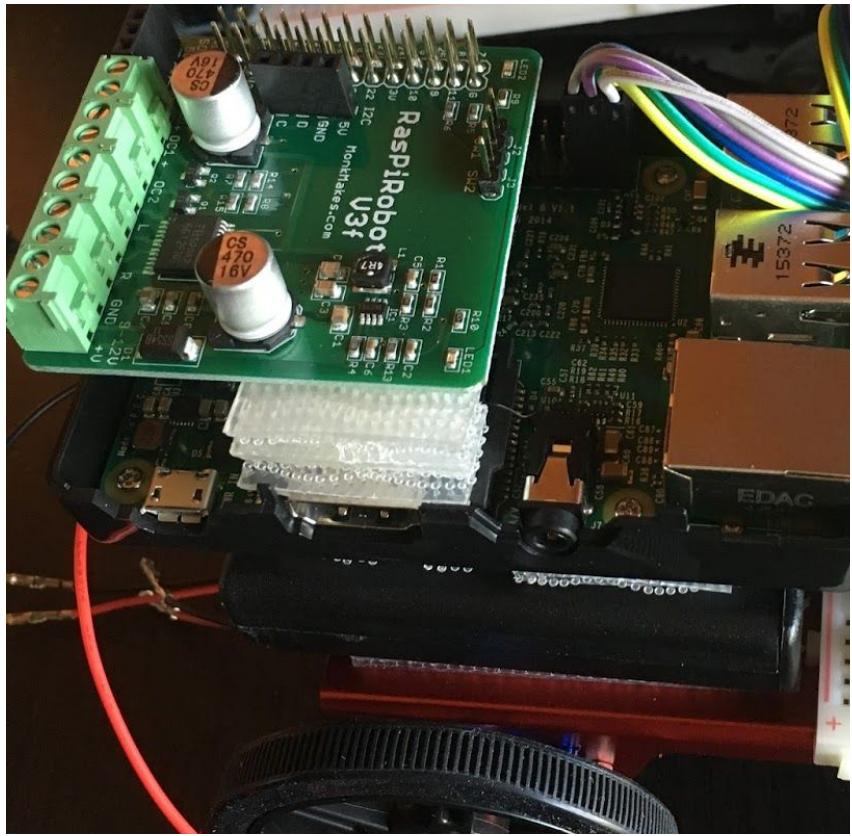
Mount Battery Pack to Chassis

Next we will use the velcro strips to install the battery pack on the chassis. Place the strips on the switch side of the batteries, remove tape, and set on the cassis towards the back (but not overlapping the end of the metal).

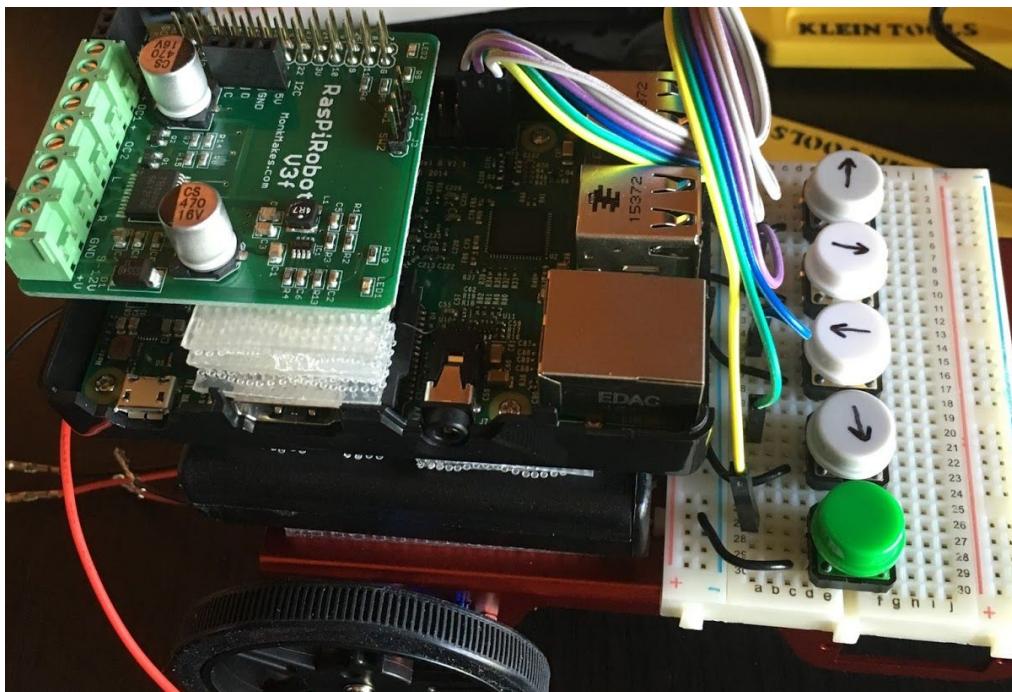


Mount Pi to Battery Pack

Following a similar pattern, we will install two additional velcro strips on the bottom of the pi to the top of the battery pack.

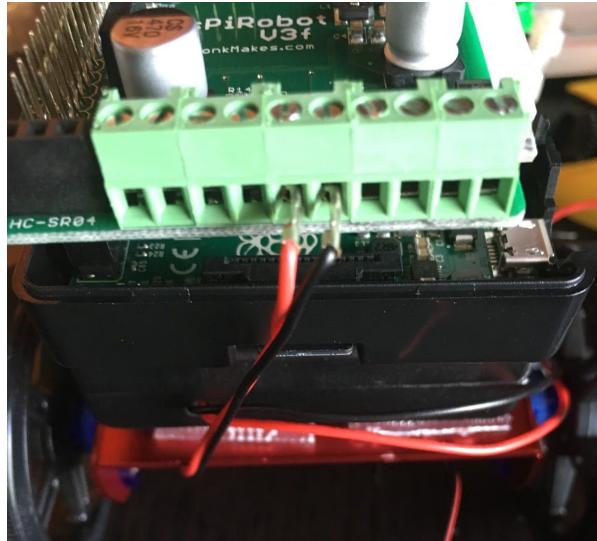


Finally remove the paper backing on the breadboard and insert in front of the Pi.

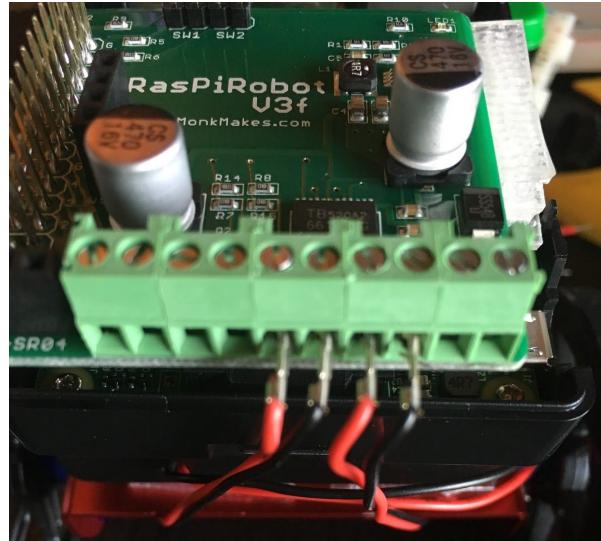


Wire Motors and Batteries to RasPiRobot Board

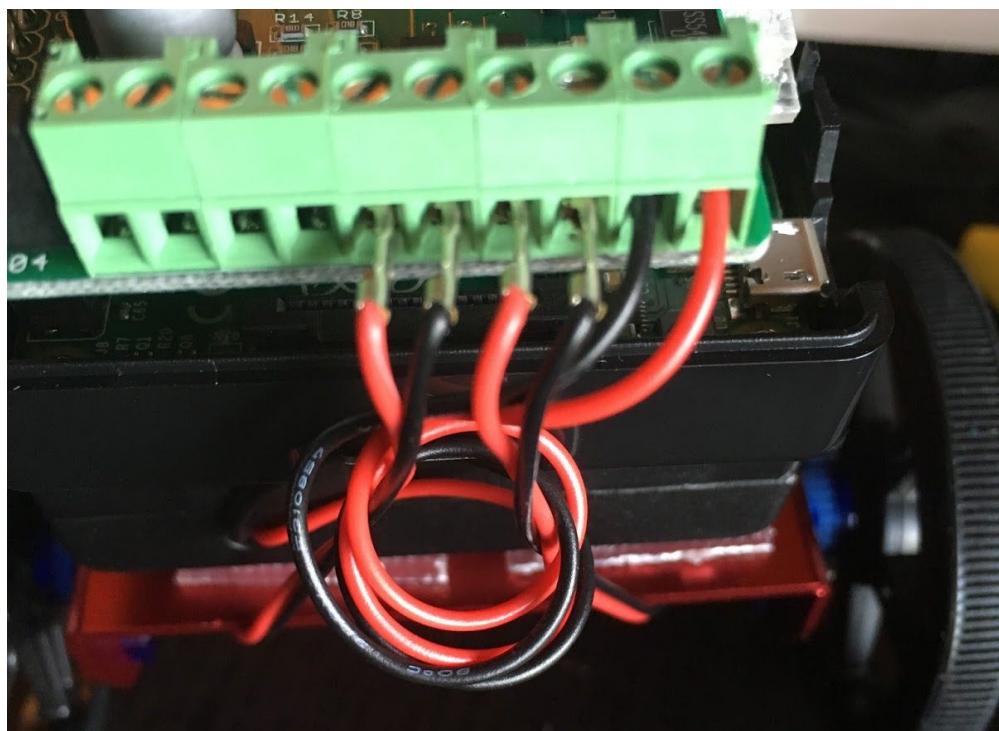
Install the wires for the left motor, right motor, and batteries following the figures below:



Left Motor



Right Motor



Batteries