

Lab 6-Integration

Learning Outcomes:

- System integration
- Troubleshooting

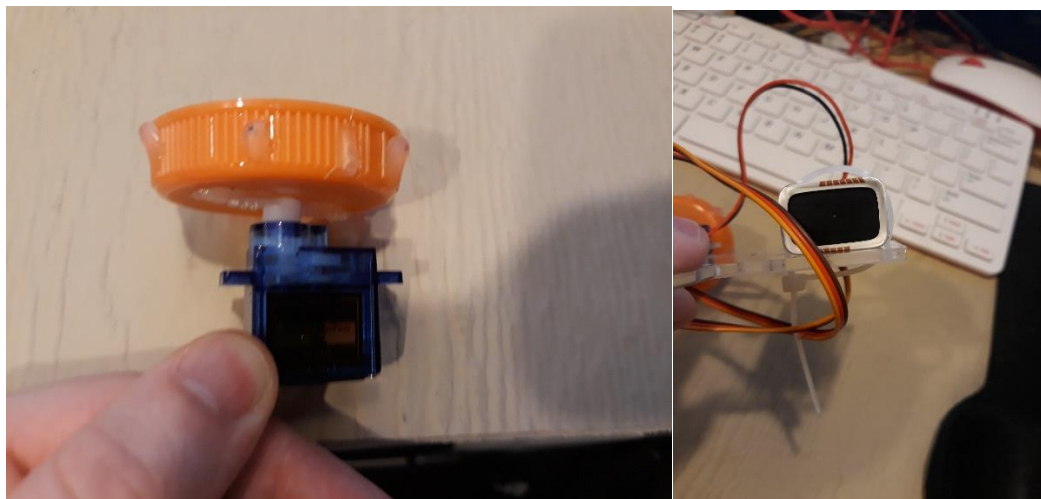
Background:

Up to this point we've only tested individual systems of the AutoNoMouse (ie servos, ultrasonic range finder, PCB) today we'll be integrating these subsystems into a whole. This process is called system integration. Integration can sometimes be frustrating because you might not know what system or component is not working. The best thing to do is be patient and logically troubleshoot one thing at a time until you can determine the thing that is not working.

Part 1 Build:

The first thing we'll do is attach all our components to our acrylic base mechanically. Then we'll start connecting the electronics.

1. Use a Phillips screwdriver to poke a hole through the center of your wheels
2. Use hot glue to glue your wheels to your servo mounts
3. Add the screw provided with your servos for extra support
4. Put a dot of hot glue around the circumference of your wheels about every 1cm (this helps the wheel maintain traction)
5. Hot glue and zip tie your servos to the two wings of your board.
6. Zip tie your battery to the end of the board. Make sure that you insert the zip in the correct manner to create a caster. (From the bottom insert it through the hole closest to the edge) Check that it's inserted correctly before tying it



You may have noticed we haven't attached the PCB yet. This is because we might need access to the bottom of the PCB to test the electronics next.

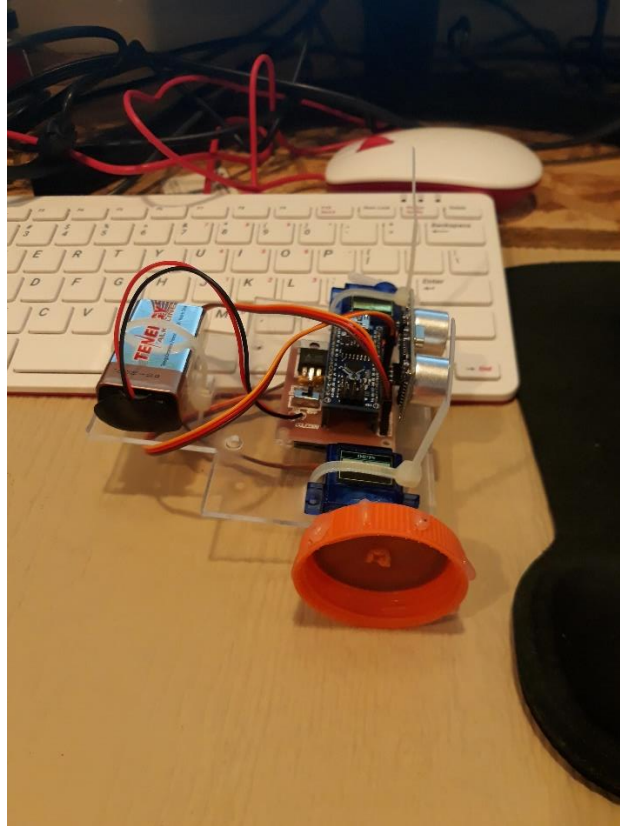
Part 2 Electronics:

Next, we'll attach the electronics to the PCB, upload some code, and see if it works.

WARNING: Because of the Arduino Nano receives power from the USB make sure that the Arduino is never plugged into the computer while it is inserted in the PCB. If you want to reprogram your Arduino, take it out of the PCB, program it, reinsert it, and power with your battery.

1. Run the servo wires through the hole next to the servo, diagonally across the bottom of the board, then back over to the 3 header male pins. Make sure to attach the left servo to the left servo pins and vice versa
2. Upload the code provided for this lab
3. Unplug the Arduino from your device, flip the switch, and see if your car is operating correctly.
4. If everything is working correctly (check that it is, it will be hard to remove your PCB) add some double-sided foam tape to your PCB and attach it to the base.

That's it, you've finished this course. Congratulations!



Extra Credit:

Try changing the code to make the car do different things.