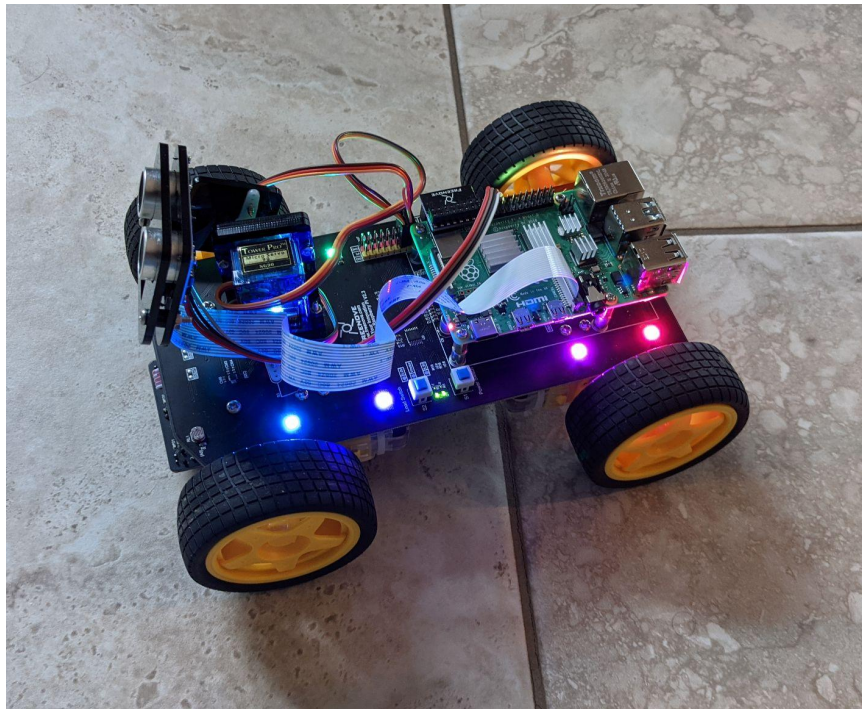


Building Robo (RoboCar-02)

Juliet N. Seliger



2021 4-H Computer Project

Division 1

Project Goals:

- I like building things and I want to be an inventor.
- I wanted to learn how to build a robot and see what it does.
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Accomplishments:

- I built a robot
- The robot I built does a lot of things
- I've learned simple commands to tell my robot what to do

Thoughts on the Overall Project:

- It was fun!
- It wasn't as hard as I thought it would be.
- Advice I would give is really follow directions, or else, it won't work right.
- My favorite part was building the robot and getting to drive it, and seeing what it could do.
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Date: Mon, May 3 2021

What I worked on: We had to download the latest pi os. I also installed the heat sinks.

Problems I faced: I messed up two of the heat sinks. The tiny screws are hard to twist on.

How I fixed my problems: My dad had to fix the heat sinks.

What I plan to do next time: Continue to make my robot.

Anything I learned: I learned that downloading can take forever.



Date: Sunday May 9, 2021

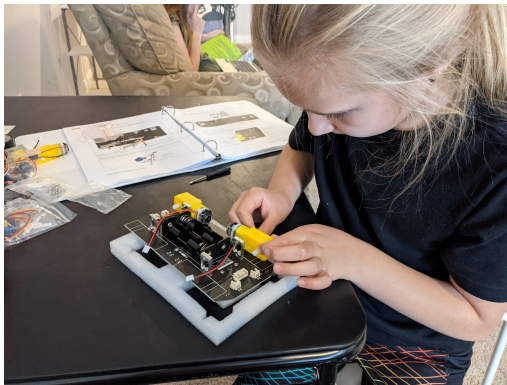
What I worked on: I typed commands to lock the servos (the blue motors) in place.

Problems I faced: The tiny screws continue to be hard to twist. First, when I was putting on the pi, I forgot to put on the standoffs. Standoffs are little pieces that hold the pi a bit higher than the normal height on the board. That gave me some problems with putting on a little piece (the header). The header connects the pi to the board of the robot. It wasn't going on right. It would either touch the pins on the robot board, but then not touch the pins on the pi, or touch the pins on the pi, and not touch the pins on the robot board.

How I fixed my problems: My dad looked at the picture, and he noticed I was missing pieces. So then we had to take off the pi, and undo 4 screws, put the standoffs on, replace the pi, put the header on, and then screwed it back on.

What I plan to do next time:

Anything I learned: Following directions is important!



Date: Monday May 10, 2021

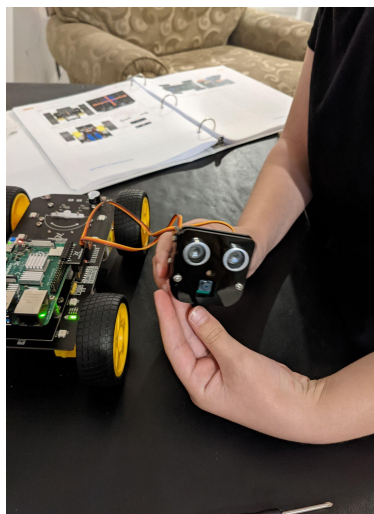
What I worked on: Today I built the robot's sensors and head. My dad helped me tighten the screws, and taught me the test program for commands.

Problems I faced: When I put in the motor, it was the wrong way. I was very frustrated! Another problem was the camera was already put in, but I didn't take the camera cover off. The picture didn't tell me the right screws to use.

How I fixed my problems: I looked at the tutorial pictures, my dad helped me realize it was backwards, and I flipped the motor around. I had to use a different screw.

What I plan to do next time: Next time I plan to get the sensors and camera connected.

Anything I learned: It's very important to follow the tutorial. The sensors and head were tricky to make. My robot buzzes, has a lot of cool lights, and can drive, and switch his sensors (they look like eyes) around when I command them on the computer. My robot has 6 motors. There are 2 types. The types are 4 normal motors. The normal motors control the wheels. The other 2 are the servos. They help the sensors move. There's a 0 servo, and servo 1. Even though they're the same motors, they don't do the same thing. One of them goes up and down like you're nodding your head. The other one will make the sensors go sideways like you're shaking your head.



Date: Tuesday May 11, 2021

What I worked on: I plugged in two cables to the robot, and I ran some tests to see if my robot did what it was supposed to, which was go forward, go backwards, then turn left, then turn right for 1 second for each.

Problems I faced: First, the robot did reverse, forward, right, left.

How I fixed my problems: I had to download a secure shell app.

What I plan to do next time: I plan to keep working on it. I will try to do pages 61 - 64 in the tutorial.

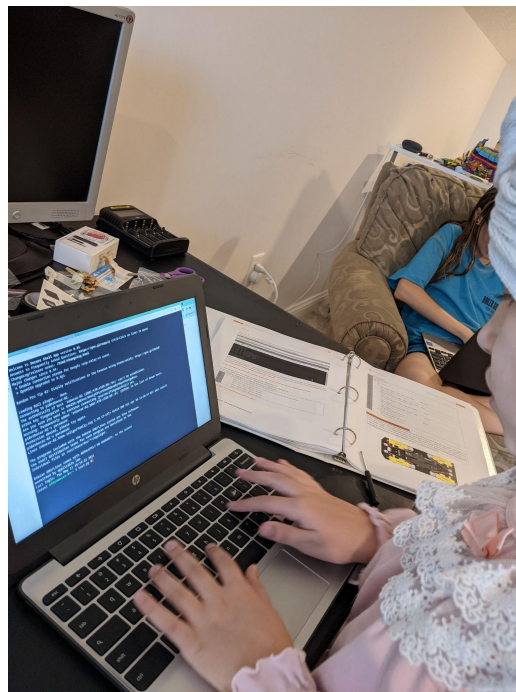
Anything I learned: I learned some coding for the robot.

sudo python test.py Led = turns on the lights

sudo python test.py Motor = robot moves forward, backwards, left, right

sudo python Led.py = the lights go crazy

sudo python test.py Buzzer = turns on the buzzer sound for 3 seconds



Date: Saturday, May 15, 2021

What I worked on:

Today we worked on more testing. We tested the Ultrasonic sensor. It worked. On my computer, it said how far I was and how close I was to the sensors. We also tested the robot taking photos from the camera under its sensors. I got my first photo with my robot.

Problems I faced:

We tried to get my robot to follow a spotlight. It didn't work.

How I fixed my problems:

We did not fix the problem where the robot follows a spotlight. We will try to fix it later.

What I plan to do next time:

Finish testing the tests in the book.

Anything I learned:

My robot can take pictures. The sensor can see how far away things are from its sensors. It uses echo locations like bats do. This makes sure it doesn't bump into anything, like walls or anything in its way (if it's in the sensor's sight).

Date: Wednesday, May, 19, 2021

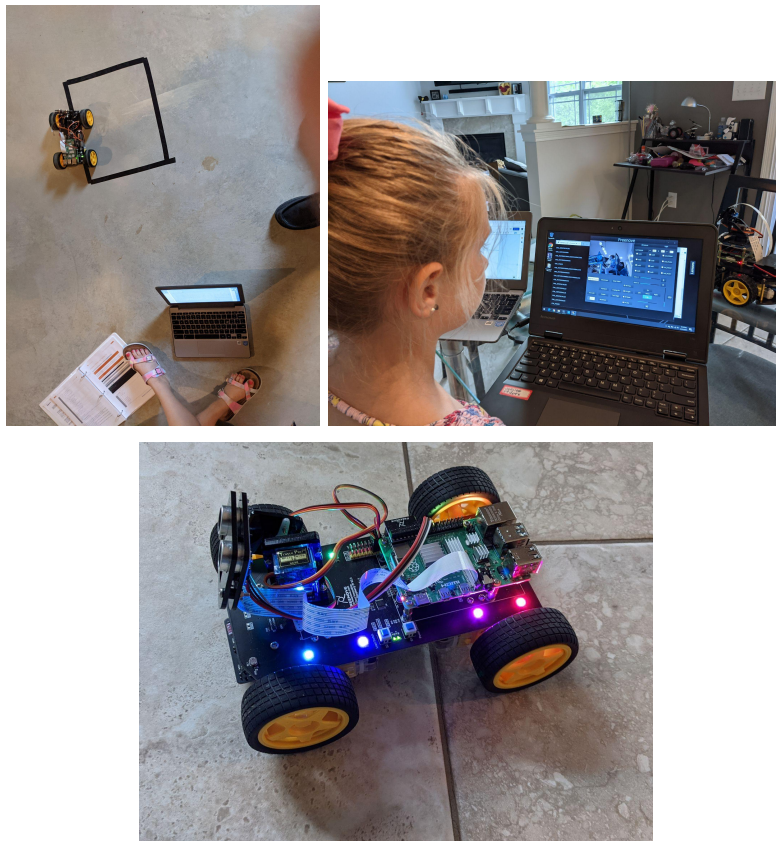
What I worked on: I worked on more testing and figured out that my robot can drive. Then, when he gets close to something he backs up or turns around because he used echolocation. He also can follow black lines.

Problems I faced: None

How I fixed my problems: I had no problems

What I plan to do next time: Keep testing. Keep trying to get him to follow a spotlight.

Anything I learned: I learned that my robot can drive and when he gets close to something he moves away from it. He follows black lines and I can control him by using my computer. He can also track peoples faces. On my computer, when the camera is on, I can see what he is seeing, and when it comes to a person's face, or to a round subject that resembles a face, the face gets a green circle around it on my computer.



Date: Tuesday, May 25, 2021

What I worked on: Driving my robot.

Problems I faced: First I thought the arrows moved the robot but it was actually the letters W,A,S,D that will move the robot.

The robot was beeping, and it wasn't doing anything.

How I fixed my problems: I noticed it wasn't doing anything with the arrows, so I looked back into the instructions, I realized I wasn't doing it correctly.

I asked my dad why it was beeping.

What I plan to do next time: Continue to practice driving.

Anything I learned: I learned W means move forward, A means move left, D means move right, and S means move backwards. The arrows mean which way your sensors are going.

The robot beeps when it thinks the battery is low.

Date: June 15, 2021

What I worked on: Journaling my project.

Problems I faced:

How I fixed my problems:

What I plan to do next time:

Anything I learned: I learned how to download a photo and insert it into a document.

Resources

Freenove 4WD Smart Car Kit for Raspberry Pi - Instruction Manual

Corey Seliger -

He bought me the robot kit.

He helped me tighten screws, or help solve my problems.

He showed me how to download the latest software.

Google Photos - for saving my pictures / adding them to journal