

Daily Log

Monday September 30

Figured out how to reverse the controls between steering and throttle. We switched some wires so that the tire that turns the wheels on the transmitter made the car accelerate instead. This has no real benefit, it was just interesting to see that it worked. We also Wired up an LED on a breadboard and got our simple LED on/off program to work. Found a diagram of what the pinouts do.

Wednesday October 2

Found female to female wires on Amazon and ordered them through Mr. White. We also ran some code to read GPIO input. We wired up a breadboard with a resistor and we were able to read if the signal was greater than 3.3v or not. We were also able to observe the voltage drop across a 470 Ohm resistor, noting that we got different values on either end. We also found a blogpost where a person tried to control a traxxas using a Raspberry pi. We may investigate his methodology if we cannot figure it out on our own.

Friday October 4

Found Traxxas 2056 (the steering servo) specs. The servo is analog so we are trying to write PWM values to it. The nut size holding tires to axle is 9/32 in (incase we need to tighten it to reduce wobble) . We started with changing the brightness of an LED using PWM, afterwards we were able to control the 2056 servo, which steers the car, using the Pi. The wheels turned left and right, but the tires were jittery, and there was an unexpected delay between turns.

Timeline

Date	Goal	Met
Today minus 2 weeks	Create "road" patterns for car to follow and have Lidar code compiled and running	Yes, Tony started making the rules set that the car would follow, and we both got the sdk demos to compile and run
Today minus 1 week	Find/Place an order for a Raspberry Pi and have the Lidar data visualized	Yes, we have acquired a Pi, but we still have not confirmed our data visualization is accurate (seems reflected)
Today	Hook up the Pi to the Rustler, and write a program to steer the car from the Pi.	Yes, but there needs to be substantial debugging as the movement is weird
Today plus 1 week	Have the car move on its own via the pi interfacing with the esc	No, we have not started
Today plus 2 weeks	Create a way for the Lidar to provide data to the Pi and have the car gather data by itself	No, we have not started

Reflection

We have achieved a major milestone by being able to control the car with the Pi, but the car is not exactly moving the way we want it to. This could be due to a host of factors, many of which I suspect, have to do with the specs of the steering servo. We will have to do more research to find the refresh rate, and most likely will have to alter the voltage we provide it in some way as well.

I originally had the goal of creating courses as a goal for the upcoming weeks, but I removed that in favor of taking a different approach. We want the car to be somewhat autonomous before we invest in designing courses for it, We plan on having the car move in a straight line until we throw an obstacle in its path. It should move out of the way. We have not figured out the exact specifics, but we will most likely have a hard algorithm (no neural net yet) with the car being fed nothing but Lidar data, and being controlled only by the pi. I have changed the timeline to reflect this goal.