Journal Report 20

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Daily Log

Wednesday March 4

Continued working on setting up the car to get training data. The internet in the Sysadmin area was broken so we went into the other room to use an ethernet cable. One challenge is getting all the components under the car, including the breadboard, Xbee, Arduino, battery, and Pi. Hari thought of using resistors to hold the car's top in place. Additionally, since we relocated the Lidar sensor, we now have a small hole in the top to put wires through. We were able to run the LIDAR data gathering program and unplug the ethernet cable. However, we had some issues with getting the car to steer.

Friday March 6

Today we spent more time working on what we did on Wednesday, but then decided to try wiring directly to the car instead of the XBees. Wiring directly has some advantages, such as making the car lighter and less cramped with stuff. With direct wiring, we do not need a breadboard on the Pi, or a second Arduino. The battery will also have fewer things to power, which is one of the issues we encountered today. Since the battery powers the steering servo, Pi, and LIDAR with the XBee wireless control setup, it had trouble steering. In addition, we already got the direct wiring control to work at the end of December. We revisited that code today and rewired the car and controller, and got it mostly to work. One thing that we will have to do every time before driving the car with the direct control is tricking the ESC by first plugging it into the radio and then quickly putting the ground and motor signal wires into the controller we made.

Timeline

Date	Goal	Met
Today minus 2 weeks	Make the collection of data wireless using the XBees	Yes
Today minus 1 week	Control the car wirelessly using our controller	Yes
Today	Gather training data	No
Today plus 1 week	Format training data to work with the neural network and gather more training data	No
Today plus 2 weeks	Gather more training data and have the model converge	No

Reflection

Our biggest obstacle is now time. We will have to work as fast as possible in order to gather training data, create a neural network, export it, and have it run on a coral TPU. I have just realized that our current neural network uses CUDA in order to run, and that the Coral TPU might not be able to support it. Fortunately, switching over to standard LSTM cells without CUDA will not disrupt our model too much. The main drawback is that our training times will increase significantly.