

Week 11

Situation

This week, the group focused on fixing the debilitating problem the AEV had where it would only work a fraction of the time. By troubleshooting and testing different solutions, and eventually getting outside help, the cause of the problem was identified as being the initial placement of the wheel relative to the sensor, and guidelines were put into place to ensure proper functioning in the future. After the main issue was resolved, the code was finally able to be worked on to complete the mission. Throughout the week the code was advanced from simply getting the AEV to the first gate to being able to pick up the trailer and bring it back to the gate each time.

Results & Analysis

In this lab the team figured out why their AEV would not follow the code consistently. The AEV would sometimes stop at the gate perfectly, however, other times it would not slow its speed at all. The team thought that it was due to Arduino being old, the reflectance tape being old, the sensor not working, or even the code being wrong. After testing all of these the team concluded it must have been due to only having one sensor. Through further inspection, it was found that the AEV would work when the sensor began facing the reflectance tape, but fail if it started with the wheel. This is due to the sensor only picking up on the binary if it begins with the tape. The team had to choose between making a new part that could include a second sensor, or make sure that the AEV always began on the tape. Due to the limited time and to wanting to continue only using limited materials, the team thought it would be best to continue with their current design as long as they start with the sensor on the tape. The team is still currently working to get a proper code that can get all the way to the trailer and retrieve it. There are slight adjustments to figure out how much power is needed to actually carry the trailer and figure out how to make it as accurate and precise as possible.

The group plans on optimizing energy by creating an AEV that is both lightweight and efficient. The final design for the vehicle is a long vertical arm that also acts as a body that can hold the Arduino and battery. This lightweight design will require less power to move the vehicle across the track and the vehicle will still be able to meet its time requirements. Energy will also be saved due to the fact that the AEV relies on coasting to travel across the track. An initial power supply is added then cutoff in order to ensure that a minimal amount of energy is being used to propel the vehicle to its desired location. The only problem that has occurred so far with the group's strategy is that the propelling distance can sometimes miss a gate sensor by about an inch. The group plans on fixing this issue by making a more precise code that will decrease the amount of failures and increase the amount of successes.

Takeaways

1. The AEV needs to start with the sensor over a silver portion of the wheel or else it will not run correctly.

2. Go to T.A's/Schrock sooner when issues arise
3. A bad battery will mess up the position of the AEV

Week 12

Situation

In this lab, the goal is to develop a code for the entire track. Thus far a code only up to the trailer works. This will be accomplished by changing the position function until the AEV stops in a desirable location. In addition to this, the power input will be manipulated in order to account for the trailer's extra weight. In doing this, the major portions of the code will be completed and the rest of the time can be spent on fine-tuning the AEV to work as well as possible.

Weekly Goals

1. Design a code that gets the AEV back to the gate carrying the trailer
2. Ensure there are no more unforeseen hardware issues by testing the AEV multiple times

Weekly Schedule

Task	Teammates	Start Date	Due Date	Time Needed
Week 11 Progress Report	All	4/3/2017	4/7/2017	2 Hours
Oral Draft	All	4/3/2017	4/5/2017	1 Hour

Appendix A

Date: 4/3/17

Time: 12:40-3:00

Members Present: Lizzie Rumford, Josh Penko, Collin Barack, Madison Hudak

Topics Discussed: Lab 11 Progress Report , Oral Presentation Draft

Objective:

The focus of today was to complete the Lab 11 Progress Report due on the 4/7/2017 and the oral draft due 4/5/2017.

To Do:

- 1.) Lab 11 Progress Report.
- 2.) Oral Presentation Draft

Decisions:

- 1.) Keep using one sensor
- 2.) Toss out first code in favor of a less complicated `celerate()`; code

Reflections:

1. Convince Schrock there is an issue sooner rather than later
2. Answer Schrock's questions sooner rather than later
3. Always run the AEV multiple times to make sure there is no issue with the AEV

Appendix B

```
// Phase 1
reverse(4);
motorSpeed(4,20);
goToAbsolutePosition(-165);
reverse(4);
celerate(4,20,0,2);
motorSpeed(4,0);
goFor(9.5);
reverse(4);

// Phase 2
motorSpeed(4,25);
goToAbsolutePosition(-330);
// travelled roughly halfway before stopping, double(ish) value required!
reverse(4);
celerate(4,25,0,2);
motorSpeed(4,0);
goFor(1);
reverse(4);
```