Group P - Ishan Taparia, Wenbo Nan, Kyle Fathauer, Jason Hahn Progress Report 1

Instructor - Dr. Parris, GTA - Sheena Marston
1/27/17

Week 1

Situation

During last week's lab, the team worked on two main tasks, setting up the propellers on the motors and using basic Arduino function calls to control the propellers. Setting up the propellers on the motors was necessary as they will generate the driving force of the AEV in future labs. The team followed the instructions from the lab manual step by step to set up the equipments. A large majority of the functions that will be used extensively in the future were learned through using the Arduino IDE (Integrated Development Environment) and tutorials/documentation supplied by resource documents on the Carmen Page.

Results & Analysis

The Arduino code successfully compiled and the motors performed the coded tasks in Scenario 1 and Scenario 2, which was a motor rendition of the Imperial March. There was difficulty in compiling the Arduino code as one team member's copy of the sketchbook lacked the libraries to compile the code. This was resolved by having another team member compile the completed code on his computer. Little guidance was needed on the lab procedures except during the aforementioned compiling error and determining how many times the steps in Scenario 2 would be repeated.

From the completed scenarios, the group learned how the Arduino commands interact with the motors and how the motors perform. Specifically, it was noted that the "celerate" function does not cause the motor to accelerate/decelerate as expected. The observed results were the motors getting up to speed after several second of not moving and only making noise. This is most likely caused by resistance impeding the motors from operating at low speeds.

The design of the AEV Arduino code will have to take into account that the code only affects the motors and not the AEV as a whole. Specifically, it will have to be taken into account that the AEV will not immediately slow when the motor speeds are reduced and that the "brake" function will not stop the AEV. Further testing will need to be done to see how the AEV behaves when motor speed changes occur and when the motors stop.

Takeaways

1) AEV -- The myriad number of Arduino commands that will be used for future labs.
2) AEV -- The proper method of setting up testing environment.

3) General -- Meeting weekly to discuss is essential to create progress.

Week 2

Situation

During week two the team is supposed to refer the 3D Model in the AEV Documents to build the basic structure of the AEV design. It is necessary because it helps the team to foresee the future constructions and have a basic idea of the product design. The primary goal for the team will be setting up and understanding the sensors systems that will be used in the project. These sensors be implemented in the data collection and allow more precise coding for the AEV tasks. The other data that will be collected from wind tunnel testing the motors to determine efficiency and thrust produced.

Weekly Goals

1. Learn how to use external sensors.
2. Learn proper function calls for the Arduino.
3. Learn troubleshooting techniques for the AEV.

Weekly Schedule

Table 1

Task	Teammate(s)	Start Date	Due Date	Time Need
Week 1 Progress	All	1/20/17	1/27/17	2hrs
Pre-lab Preparation	All	1/20/17	1/27/17	2hrs

Appendix

Arduino Code for Lab 1 Scenario 1:

```
//Accelerate Motor 1 from 0 to 15 over 2.5 seconds
celerate(1,0,15,2.5);

//Motor 1 set to 15% power
motorSpeed(1,15);

//Previous command for one second
goFor(1);

// Brake motor one.
brake(1);

// Accelerate motor 2 from 0 to 21 over 4 seconds
celerate(2,0,27,4);

//Motor 2 set to 27% power
motorSpeed(2,27);

//Previous Command for 2.7 seconds
goFor(2.7);

//Decelerate motor 2 from 27 to 15 over 1 second
celerate(2,27,15,1);

//Brake motor 2
brake(2);

//Reverse polarity of motor 2
reverse(2);

//accelerate all motors from 0 to 31 over 2 seconds
celerate(4,0,31,2);

//All motors set to 35%
motorSpeed(4,35);

//Previous command for 1 second
goFor(1);

//Brake motor 2
brake(2);
```

```
//Motor 1 set to 35%
motorSpeed(1,35);

//Previous command for 3 seconds
goFor(3);

//Brake all motors
brake(4);

//Previous command for 1 second
goFor(1);

//Reverse polarity of motor 1
reverse(1);

//Accelerate motor 1 from 0 to 19 over 2 seconds
celerate(1,0,19,2);

//Motor 2 set to 35%
motorSpeed(2,35);

//Motor 1 set to 19%
motorSpeed(1,19);

//Previous command for 2 seconds
goFor(2);

//All motors set to 19%
motorSpeed(4,19);

//Previous command for 2 seconds
goFor(2);

//Decelerate all motors from 19 to 0 over 3 seconds
celerate(4,19,0,3);

//Brake all motors
brake(4);
```

Arduino Code for Lab 1 Scenario 2:

```
//Declare counter for while loops
int x=0;

//reverse all motors
reverse(4);

//Loop three times
while(x!=3)
{

//Set all motor's to 25% power
motorSpeed(4,25);

//Previous command for .1 seconds
goFor(.1);

//Stops all motors
brake(4);

//Previous command for .1 seconds
goFor(.1);

//add one to counter
x=x+1;

//end loop
}

//All motors to 15% power
motorSpeed(4,15);

//Previous command for .3 seconds
goFor(.3);

//Stop all motors
brake(4);

//Previous command for .05 seconds
goFor(.05);

//All motors to 40% power
motorSpeed(4,40);

//Previous command for .3 seconds
goFor(.3);

//Set all motors to 25% power
motorSpeed(4,25);
```

```
//Previous command for .5 seconds
goFor(.5);

//Set all motors to 15% power
motorSpeed(4,15);

//Previous command for .3 seconds
goFor(.3);

//Brake all motors
brake(4);

//Previous command for .05 seconds
goFor(.05);

//Set all motors to 40% power
motorSpeed(4,40);

//Previous command for .3 seconds
goFor(.3);

//Set all motors to 25% power
motorSpeed(4,25);

//Previous command for .5 seconds
goFor(.5);

//Brakes all motors
brake(4);

//Previous command for .05 seconds
goFor(.05);

//reset loop counter
x=0;

//Loop 2 times
while(x!=2)
{

//Set all motors to 55% power
motorSpeed(4,55);

//brake all motors
brake(4);

//Previous command for .05 seconds
goFor(.05);
```

```
//add one to counter
x=x+1;
}

//Set all motors to 65% power
motorSpeed(4,65);

//Previous command for .3 seconds
goFor(.3);

//Stop all motors
brake(4);

//Previous command for .05 seconds
goFor(.05);

//Set all motors to 40% power
motorSpeed(4,40);

//Previous command for .3 seconds
goFor(.3);

//Set all motors to 25% power
motorSpeed(4,25);

//Previous command for .5 seconds
goFor(.5);

//Set all motors to 15% power
motorSpeed(4,15);

//Previous command for .3 seconds
goFor(.3);

//Stop all motors
brake(4);
//Previous command for .05 seconds
goFor(.05);

//Set all motors to 40% power
motorSpeed(4,40);

//Previous command for .3 seconds
goFor(.3);

//Set all motors to 25% power
motorSpeed(4,25);
//Previous command for .5 seconds
goFor(.5);
//Stops all motors
```

```
  brake(4);
```

Team Meeting Notes:

Date: 24 - Jan - 2016
Time: 5:30 (Face-to-Face)
Members Present: Ishan Taparia, Wenbo Nan, Kyle Fathauer, Jason Hahn

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Objective:
Today's meeting was focused on setting up a way to collaborate on documents, completing the first Progress Report, and setting up the project portfolio on u.osu.edu.

To do:

- Progress Report Lab 2 (IT, WN, KF, JH)
- u.osu.edu (JH)

Decisions:

- The group decided to use a shared Google Drive folder to collaborate on the project.
- Group meetings will be moved to Saturday afternoon.

Reflections:

- After today's initial meeting, it will be very easy to record information and complete assignments in the following weeks as we have a complete template for everything.