
EE/CprE/SE 491 WEEKLY REPORT 2

Feb 11 – Feb 24

Group number: 06

Project title: Race of Doom

Client &/Advisor: Dr. Bigelow

Team Members/Role:
Andy Nguyen - Electrical Hardware Design and integration
Aaron Gienger - Embedded Hardware Programming
Ben Dubin - Software Development Programming
Blake Carlson – Embedded Hardware Programming
Carson Tow - Hardware Security Programming and Team Representative

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- **Weekly Summary**

  During the last two weeks our team has focused on testing and integrating our Arduino with our vehicle's motors/movement control. This included testing the steering control servo using the servo.h library from Arduino, which proceeded without problem. We were able to both read angle values as well as control our steering servo. It also included testing the control over our Electronic Speed Controller, which gave us issue during the testing process. The ESC we have on our car uses proprietary processes from Traxxas which requires initialization from the remote. This led to either poor control from faulty initialization and calibration or a lack of control entirely. Currently we are still working on the issue. Additionally, we are continuing the testing of accuracy of our sensors as well as calculating necessary angles and distances for the sensor mounting points

- **Past week accomplishments**

  Andy Nguyen – *Continued to work on hardware/electrical implementations. Reworked the current electrical design, resulting in a less cluttered and convoluted circuit. Andy worked with the software team to test the ESC, modifying the circuit to fit the software team's needs. He also worked alongside Blake on the design of the front bumper. Andy helped design a physical test for the ultrasound using the front bumper material which helped determine optimal sensor placement.*

Aaron Gienger – *Worked on researching test code for our hardware design. Aaron continually worked on finding and making adjustments to test code for the multiple iterations of our hardware design. Aaron also worked on the debugging of test code during the servo and speed controller during testing.*

Ben Dubin – *Continued working on the code base and hardware to software connection. Tried to debug the electronic speed controller with the Arduino by trying to mimic the arming sequence done by the receiver and transmitter that came with the vehicle. I also diagnosed an issue with our battery and had to order a new battery since one of the cells had died completely. I also*

Blake Carlson – *Continued working on the hardware design, doing more testing as well as debugging the electronic speed controller to work with the Arduino. Blake also calculated where the ultrasound sensors would be best suited in the front of the RC car. Blake tested how the sensors would function based on how they would be mounted. As well as mark the rest of the measurements for the cutout on how foam bumper mount.*

Carson Tow – *Carson worked on implementing designs for the bumper and sensor mounting points. Carson also is continually working with the other teams for the project (who are working on the other Car and Track) to discuss progress on the car design as well as discuss limitations of the vehicle designs and what obstacles would be reasonable as the trac team worked on their implementation. Carson also worked on drafting the bi-weekly reports and other documentation.*

- **Plans for the upcoming week**

Andy Nguyen – *Andy will work on mounting implementation for sensors to maximize scan quality.*

Aaron Gienger – *Aaron will continue to help contribute to work on test code for ESC integration.*

Ben Dubin – *Ben will continue to debug issues in the ESC connection with Arduino. As well as work on refining control for the servo and ESC.*

Blake Carlson – *Blake will continue working with the hardware to test sensor capacity including accurate range of measurement for distance and angle.*

Carson Tow – *Carson will aid in physical and software design implementations in respect to obstacle and trap navigation/solutions.*

1. Individually review Section 4.4. Consider the following questions:
    1. Have we identified or become aware of new effects?
    2. How can we argue for or provide evidence of positive effects?
    3. How can we address or justify negative effects?
2. Meet as a team and revise Section 4.4 with your new insights.
3. Meet with your client and advisor to discuss your updates.
4. Add a section to this report with any (1) updates to broader context effects, (2) plans to demonstrate evidence of positive effects, and (3) ways to address or justify negative effects based on meetings with your team, client(s), and advisor.

- **Considerations from section 4.4**
    - **Have we identified or become aware of new effects?**
        - For environmental factors, during the second semester of senior design we've become more aware of the necessary factors for the track team and the scope and size of the track. That is, their electronics are much less mobile and are more susceptible to water damage. This means that we had to take more consideration with the location of both our testing and final race.
        - Additionally, for the budget we have had to continue to taking into account new budgetary restrictions as we have needed to replace parts including sensors and batteries.
    - **How can we argue for or provide evidence of positive effects?**
        - For our project, many of the positive effects would be within the Electrical and Computer engineering department. The things learned and the code/RC base for the project could be used for future senior design projects or class project implementation.
    - **How can we address or justify negative effects?**
        - There are no significant foreseeable negative effects due to the scale of the project.