CprE 4920 Status Report 4

02/28/2025 - 03/13/2025

Group number: 8

Project title: Race of Doom

Client &/Advisor: Dr Bigelow

Team Members/Role: Alex Crandall, Wesley Jansen, Elizabeth Schmitt, Ben Towle, Lalitha Vattyam

---

- **Weekly Summary**

The past 2 weeks we have been working on a lot of hardware and getting everything organized for our project as a whole. We found a program that will be able to use the camera sensor and find data from that. We have also been testing the battery and working on hat development. We have also been working on the software skeleton.

- **Past Week Accomplishments**
    - Team Member 1: Alex Crandall: These weeks we had some issues to conquer, this included the battery and sensors when it came to hardware. I worked on hooking up the ultrasonic sensors with Ben and did some testing.
    - Team Member 2: Wesley Jansen : Done research on the RPLidar sensor and starting figuring out how to implement it into our design and how it works as a whole.
    - Team Member 3: Elizabeth Schmitt : In the past 2 weeks I have been getting a start on the software part of the design. I have gotten some skeleton work going for it.
    - Team Member 4: Ben Towle: Tested all ping sensors, tested the integrated sensors with the whole system, determined what we need to portably charge the Pi, and also to slow down the car.
    - Team Member 5: Lalith Vattyam: Finished basic movement code while also implementing a main activity code to implement basic movement. A new motor or better gear train will help in making the car move more efficiently

- **Pending issues**

We are actively solving our speed issue using a different gear ratio. Currently we use a 16T pinion gear and if we reduce this to a 12T, it will significantly decrease the top speed of our vehicle while increasing torque. Currently, we ran into an issue with supplying the raspberry pi with enough power for it to run. Our solution is to order an external power source compatible with Pi 5 so that we can keep it running without tethering the pi to the wall. Lastly, we encountered a latency issue with our webcam. The frame rate of our webcams output is way too slow so we need to implement our own buffer management solution to optimize the performance of the webcam.

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours These weeks**	**HOURS cumulative**
Alex Crandall	Set up Sensors and performed testing	10	103
Wesley Jansen	Lidar beginning implementation	9	101
Elizabeth Schmitt	Got software setup, began working on logic	10	100
Ben Towle	Completed the installation of the raspberry pi 5 module	12	102
Lalitha Vattyam	Finished main code implementation from basic movement.	12	103

***Starting cumulative hours count on weekly report #1**

- **Plans for the upcoming week**
  - Alex Crandall –Now that our group has determined the course of action for powering the RC car, we can focus on finishing hardware components when our orders arrive from ETG. I plan to work on the hat schematic.
  - Wesley – Finish up the lidar and get it to produce values and spin properly
  - Elizabeth – Work on logic for software and getting the car moving well
  - Ben – implement Frame buffering solution for webcam, replace the pinion gear on the motor, and monitor our order status for the hardware we need.
  - Lalith – Fix a new brushless motor on the RC car or add a better gear train to lower power

- **Summary of weekly advisor meeting**

  Today we talked with Dr Bigelow about a lot of the problems we are having with hardware and potential solutions. He had a lot of good ideas for us to go off of. The first was about the battery, which seemed to be working incorrectly. We talked a lot about different batteries that we may need to buy to replace ours. We did find a charger for our battery, so hopefully that works. He had the idea of a voltage reduction circuit to make it going more slowly. We are going to look into that and hopefully it will be a good solution. We were able to get a lot of our looming questions answered, which was great. Now we just have a lot of work to do.