

## **CprE 4920 Status Report 5**

**03/14/2025 - 04/03/2025**

**Group number: 8**

**Project title: Race of Doom**

**Client &/Advisor: Dr Bigelow**

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

---

- **Weekly Summary**

*The past few weeks we have been having some issues with hardware that we are getting figured out. We got a brushless motor to increase reliability and speed control. We are trying to get that along with the ESC integrated into our car. It has proved more difficult than we may have expected. We got a lot of details ironed out for the race track. We have also been working on the different sensors. We are trying to get the Lidar sensor working and got the Ultra-sonic sensors connected and tested. We ordered the hat for the raspberry pi and got the raspberry pi connected with a battery. We are looking at fans right now to attach to the top of the pi once the hat is one. We have continued to work on the software design.*

- **Past Week Accomplishments**

- Team Member 1: Alex Crandall: Met with ETG and confirmed an order of a hat for the pi that will allow for stable GPIO connections.
- Team Member 2: Wesley Jansen : I have been working on getting the RPLidar Sensor working and connected with my software. It has been difficult but I feel close to a solution.
- Team Member 3: Elizabeth Schmitt : In the past few weeks I have been working on the ultra-sonic sensor connection and testing. I also got the battery connected and working. It is now wireless yay!
- Team Member 4: Ben Towle: Fixed the frame buffering issue with the webcam, and updated the software so that it focuses on objects nearby (using depth cam feature) Fixed the issue with the new esc and motor. Took a while, but it came down to adjusting the frequency of the PWM signal it receives. However, the car still travels extremely fast. I troubleshooted for about 4 hours after getting the esc to work, but did not have any success in slowing the car down. I ordered a new gear that

hopefully will mesh with the current spur gear we have. Additionally, I am planning on exploring software solutions for more precise pulse-width control.

- Team Member 5: Lalith Vattiyam: Fixed a new motor and esc onto the car and started working on calibrating those parts with the RC car.

- **Pending issues**

We got a gear but it did not end up fitting so we have been talking about some different solutions for the speed of this car. We are also having an issue with the new ESC. It is not working right now and we are trying one more thing to fix it, giving it more voltage. It expects more voltage than the other one did. We will try to add the 5 volts, if that does not work, we will need to get some new parts or replace the ESC.

- **Individual contributions**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours These weeks</u></b>	<b><u>HOURS cumulative</u></b>
Alex Crandall	Ordered hat and mapped out all connections.	12	115
Wesley Jansen	Worked on Lidar Implementation.	12	113
Elizabeth Schmitt	Sensor connection, battery connection, fan	12	112
Ben Towle	Improved the frame-rate of the webcam, found solution to the ESC problem, explored solutions for slowing the car down	17	119
Lalitha Vattiyam	Finished adding the new ESC and motor	12	115

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

- **Plans for the upcoming week**

- Alex Crandall –Once our components arrive from ETG, I can focus more on full assembly of the pi and re-establishing the connections we had prior to disassembly.
- Wesley – Finish up the lidar and get it to produce values and spin properly
- Elizabeth – Work on the connection between the camera, Raspberry Pi, and Ultra-Sonic Sensors.
- 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 – Focus on understanding modem communication between Raspberry Pi, RealSense camera, and Ping Sensors

- **Summary of weekly advisor meeting**

*Last week we had a brief meeting with Dr. Bigelow in order to discuss our plans moving forward as a team. Our group is now moving away from 2 subgroups for the programming and collaborating as a whole for the remainder of the project. We also discussed the starter development for our track, and an area (outside Coover) for us to perform base-level testing. Now that we are working together, we believe we can achieve greater progress and share ideas in order to get the car working as quickly as possible.*