EE/CprE/SE 492 WEEKLY REPORT

February 11, 2024 - February 24, 2024

Group number: Sdmay24-43

Project title: ***Race of Doom***

Client &/Advisor: Prof. Bigelow

Team Members/Role: ***Peter Wissman - Computer Engineering, Gavin Petrak - Computer Engineering, Andrew Kraft - Electrical Engineering, Jack Doe - Software Engineering, Jacob Nedder - Cybersecurity Engineering***

- **Bi-weekly Summary:** These past two weeks, our team focused on developing a solid plan to mount each of our components on the RC car. We also ran into a significant problem as a crucial connector for our LiDAR sensor was missing, so a new one has been ordered. As a result, we have also decided to switch our programming to the language of C.

- **Past two week's accomplishments**
  - Peter Wissman: Communicated with other groups, found out more about track team's specifications. Communicated issues between the hardware and software side of the team. Worked on lidar testing and physical design diagram.
  - Gavin Petrak: Debugged the LiDAR sensor and attempted to make progress through serial communication. Also assisted in the creation of our layout for a compact car design once all components are added.
  - Andrew Kraft: Finished basic diagram for electrical connections(wiring/wireless). Ordered the battery we are going to use for the raspberry pi. Figured out how the base battery powers the motor and steering and what voltages they require to activate.
  - Jack Doe: Helped with the Lidar testing. started to write test cases for lidar and photo electric sensors. Switching from Python to C

- Jacob Nedder: Installed and updated necessary libraries for serial data communication on the Raspberry Pi, aided with the transition from a Python code base to a C code base. Aided with Lidar testing.

- **Pending issues**

One of the largest concerns we have is that we cannot find the USB connector for our LiDAR sensor. There are already a few of the same LiDAR sensors provided by the school; however, they are all missing this connector which would make the development of our LiDAR much easier. So, we are working with the university to find one of these connectors.

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours this week**	**HOURS cumulative**
Peter Wissman	Lidar testing, Physical design digram, intergroup communication	6	12
Gavin Petrak	Gitlab Backlog Refinement, Raspberry Pi Configuration, LiDAR Troubleshooting	6	12
Andrew Kraft	Wiring diagram, power requirements and testing, battery finalization, measurements	4	10
Jack Doe	Lidar testing, writing test cases for lidar and photo electric sensors, switching from Python to C	4	10
Jacob Nedder	Lidar libraries, Serial Communication, Raspberry Pi configuration	3	9

- **Plans for the upcoming two weeks**
  - Peter Wissman: Continue to speak with other teams to narrow specifics on the track. Work on the lidar tests and begin using C for our code.
  - Gavin Petrak: Acquire the missing USB connector for the LiDAR and begin research and development into the system using the programming language C.
  - Andrew Kraft: Figure out what to use to create a holder for each of the components we have, and start designing. Potentially start testing how the raspberry pi will activate motor and steering. Finalize connections diagram with new components.
  - Jack Doe: Start using C for our code as C is much quicker and used in higher level tasks. Begin to write basic code for our sensors and work with Jacob to ensure our code is protected from outside sources.

- Jacob Nedder: Begin proper programming using C to interact with the Lidar sensor. Ensure developed code is secure from external exploitation.

- **Summary of weekly advisor meeting**

  - Every team is on track, and we are to continue moving forward with the project.
  - look into meeting/testing with the other teams to make sure some obstacles on the track team are within the constraints set by the first semester.

- **Broader Context**

- New Effects: We have found some new effects that need to be considered. One of which is the weight of our vehicle and sensors. Our vehicle weighs a bit more than 2 pounds. Our sensors almost double that weight. Although it doesn't seem like much, our car's suspension is not built for double the weight. We also need to consider how our car's weight will affect how it rotates in the air.
- Evidence of Positive Effects: The weight of the car will allow our vehicle to be harder to move on the track, leading to fewer issues from the track team's obstacles.
- Addressing Negative Effects: The increased weight of the car means we need to place our components in specific locations to limit their effect on the vehicle's front suspension. The back suspension is stronger, so putting more weight on the back will hopefully lead to fewer issues on the car's driving capabilities.