

Project Goals:

We planned on designing and building an Omni-Wheel Oxygen Delivery Robot with the capability to track and follow a user utilizing Ultra Wideband (UWB) Triangulation and a Computer Vision algorithm implemented using OpenCV (as a failsafe). In addition to tracking abilities, we wanted our robot to be able to stop whenever the robot ran into an object to prevent any injuries or tipping over of the robot. Our main goals were to obtain a working Omni-Wheel Drivetrain that can take in inputs and drive in a specified direction. Obtain a working UWB localization system that can feed information to the microcontroller. Finally, we wanted to have a working close-range object detection system that will stop the motors of the robot once it bumps into an object in its path. At this point of the project we currently have the Close Range Object detection system working as well as the Omni-Wheel Drivetrain. In addition, we are close to finishing up the UWB localization system and Computer Vision tracking.

Expectations:

Yes, our team fulfilled all expectations. Overall, there is very little we have to comment on regarding expectations of team members not being met. Ground rules were followed, and everyone had an impactful role in this project.

Roles:

At the beginning of the course, we assigned roles to each member of the group to build subsections of the design. Rutvik is in charge of the Ultra Wideband tracking system, Nazar is in charge of the OpenCV system, and Aidan is in charge of the Close range object detection system. As time went on, we all assisted in the design and testing of the various other subsystems needed

to complete the robot to ensure that we could get it done on time. With the progression of the project, we assigned Rutvik to be the team leader as he had a clear vision of how the robot should turn out and was able to give detailed instructions on what needed to be done to complete the robot on time. We figured that by working on a majority of the subsystems as a group, this would be the most efficient way to go about this project as it allowed for all of us to understand what is going on with the robot. Oftentimes, working on a project for long periods of time gives you tunnel vision, which may cause you to miss simple mistakes. By working collaboratively on approaching these solutions, we were able to collectively solve issues related to our designs.

Agenda:

In order to make decisions related to our project, we, as a group, would directly communicate with each other either over the phone or in person. By doing this, we were able to discuss the design considerations and next steps moving forward. This process was a democracy where everyone had a say in what would be done and how it would be done. One of the main issues that has come out of this project was our PCB orders. After the 2nd round orders, the PCB took some time to get delivered, so this required us to work on and test out other parts of the project while we waited till we could validate our PCB. As a team, whenever an issue arose, we would all meet together to discuss what our next steps would be and how to go about fixing the issue as a team.

Team Issues: Most of our issues stemmed from issues with order delays and problems with technology. As a whole, we all worked well together and very rarely encountered issues with communication or disagreements about the path that the project should take. Any issues we did have were easily resolved using the procedure we outlined in our team contract.