Group #37

Mobile Robot Package Delivery
Project Executive Summary

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The purpose of this project is to implement ways to reuse recycled materials for innovative technology. This project focuses on the repurposing of recycled wheelchairs. The year's goal is to finish designing and implementing features on an inexpensive autonomous delivery robot by repurposing electric wheelchairs that would otherwise be thrown away. The robot will travel from a predetermined point to another point while carrying a load of at least 50 pounds while traversing around obstacles. We implemented the Robot Operating System (ROS) to use already existing packages which makes implementing object reaction and path following possible. This was able to happen by using sensors such as lidar, bump stops, an IMU, and a GPS. We were successfully able to implement path following and object reaction. This project will serve the community of OSU by providing fast, easy-to-use package delivery around campus. The project also serves to help reduce carbon emissions as it focuses on the reuse of materials.

Main focuses and concerns include curb detection, ledge detection, avoiding collision with moving and non moving objects, and web app development. After splitting requirements with the CS team, the ECE team’s focus was to rebuild the robot with sensors that will allow for object detection and path following. We needed to research and determine possible solutions for our problems.

Every week our ECE and CS team met with our project partner to discuss individual progress, show demos, discuss potential problems, and plan weekly tasks for each member. For each problem we ran into, the group would plan together who should take on the task and who they could possibly work with for help. After each week the team would analyse the progress made by their teammates and discuss what each member could do to optimize their time. These were internal design reviews for our team, where we could learn from each other and gain new insight on ways to tackle problems we’ve been facing.

Establishing clear goals and making sure everyone understands those goals are two critical lessons that can be learned from working as a team. This is the groundwork to trust that other members of the team can and will continue to push progress of the project forward. We’ve also learned that people have to recognize the skills in others to be an effective team.

Project Timeline