The goal of team Vision is to bridge the autonomous gap between industry and the public by creating a central autonomous nervous system fashioned onto a chassis. Public access to autonomous devices enables the modern user to accomplish more. The goal of this project is to create a vehicle that uses distance and camera sensors to follow a designated object.

Things weigh a lot, and they can be difficult to move for some people. Anyone with a disability that hinders their ability to push a cart/stroller/wheelchair and anyone inside a wheelchair. Or anyone with a physical job that would benefit from the assistance of a dolly/wagon. This includes the elderly, parents of kids who are handicapped, farmers, factory workers, etc.

**Methods**

**Parameters**
- Can carry 200 lbs. of a person or load
- Motors can go 4 mph
- Ultrasonic keeps robot at least 2 feet away from all objects
- Can follow a person

**OpenCV**

OpenCV - a library of programming functions mainly aimed at real-time computer vision - is run on our main processor - a Raspberry Pi. Originally, the team intended for the camera to track a tennis ball but it was soon found that the camera latches onto an orange safety vest more intensely. Through developing the code and color specifications the team managed to get the camera to track the object in several different environments, including outdoors and in buildings. The system works by outputting an X coordinate which sends an efferent signal to the motor controllers to decern which way the robot goes.

**Ultrasonic Sensors**

In order to determine the distance between the robot and various objects, the team decided to use ultrasonic sensors. The sensors have the following specs:
- Accurate to +/- 3 cm
- Works up to 4 m
- Outputs at a 30° cone

**Motor Controllers**

- Frequency Driven
- Inputs frequencies from 400 Hz to 1000 Hz
- Outputs voltage from -12 V to 12 V
- Inaccurate below |3| V

**Future Improvement**

**Mechanical**
- Use four wheels, all driven
- Design a specific chassis instead of repurposing
- Pillow block on wheels for protecting the motor system

**Electrical**
- Use Encoder and PID to know exact locations of motors as well as to track accurate movement of the wheels
- Implement FOB/remote to help camera decern between distracting colors and desired object
- Stereo Cameras to more accurately pick up on things occurring in the environment

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