Analysis:

All of the scans taken identified a point at each of the different corners around the border of the testing environment. However, each scan also identified corners at various points around the proximity of the environment. Additionally, not all of the corners identified were the center point of the corner that was identified, as was to be expected.

Corners identified along the edge of the environment are likely due to invalid data points, which the sensor reports back as a distance of 0. This creates an approximately right angle with the points on the side of the environment, making the point qualify as a corner. This explains the high rate of false positives

Application:

The data shows that this method has the ability to successfully detect corners in an environment with some degree of accuracy, although it does not always successfully detect the corner directly. Also, miuany other points along the edge of the environment are detected, but these can be removed by fine-tuning the algorithm and running the data through algorithm to remove these.

Conclusion:

This method for detecting corners is the basis for other, more accurate methods of modeling an environment and tracking movement. The ability to identify key points in the environment is an important component in most methods in navigating an environment. While the specific method presented in this paper was not the most robust, it did have the ability to detect corners in the environment. With time and refinement, this

Abstract:

Autonomous systems are often used in both indoor and outdoor environments for a wide variety of purposes including as agriculture, search and rescue, and high-school robotics competitions. All of these systems must be able to autonomously navigate an environment. In recent years a low-cost LIDAR range-finder has been made available in the Neato XV-11 All-Floor Vacuum System, which is suitable for use in a high-school robotics team environment. This paper will attempt to develop a simple algorithm to detect corners in the environment. This is the first step to using this sensor for autonomous navigation. The eventual goal of this research is for the sensor to be usable by any FRC robotics team with little difficulty.