

Final Prototype Testing Report

RoboSaw

By

Team 35



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Equipment and Setup:

For our final prototype testing we demonstrated that the RoboSaw was able to find the line and then perform a straight cut. We started by running the RoboSaw with no blade to demonstrate the line finding capability. We also tested the intake with the 2X4, 2X6, and 4X4. The RoboSaw was able to pull each size of wood through the intake and outake mechanisms. We then put the blade on to demonstrate the cutting of the 2X4. We asked Professor Pisano to draw a line on a piece of test wood. Once he drew the line, we fed the 2X4 through the RoboSaw. The cameras were able to identify the line and then the overhead camera aligned the wood with the blade. The output for the cameras was displayed onto a monitor to visualize the process. The RoboSaw successfully made the cut within the acceptable limits and ejected the cut piece through the outtake mechanism. We then performed a cut where we hit the e-stop button. All the safety switches worked and stopped the power to the saw.

Measurements taken:

1. The RoboSaw powered on properly and showed all the output on the monitor. The python application functioned properly.
2. The Robosaw mechanism was able to successfully feed the 2X4, 2X6, and 4X4.
3. All of the emergency stop buttons worked correctly and the pendant allowed the user to control advancing the saw, and performing the cut.
4. The robosaw was able to perform a cut within 0.0625 inches. This is within our threshold of 0.125 inches.
5. The RoboSaw was able to cut multiple pieces of wood and eject them out of the saw.

Conclusions:

We were able to verify that the intake mechanism works correctly like in the last test. The vision system also functioned correctly. The only times it didn't work were when the lines were too close together but this was in our requirements. We have a minimum distance that the lines need to be apart in order for the vision system to work correctly. In this test we had two extra cameras. This meant that we would identify if the wood was in front of the blade and also align the blade with the wood. For this test

we purchased a stand that had supports for the stock on both ends. Making sure they are the right height was critical. If they were too low the wood got stuck sometimes. This can be fixed by marking where the height needs to be for each type of wood. The final piece for RoboSaw is to rotate the saw if there is an angled cut. We have several prototype designs for this and should have it implemented for ECE day.