Strain Relief

I have encountered many issues with wires on my robot. The brain connector is fragile. When the download cable is slightly pulled it puts strain on the brain connector. If the brain connector breaks, then you have to get a new brain which is expensive. Another problem is that the smart wires get tangled with the wheels. Also, sometimes the wires will fall out of the robot making it to big in the starting position. The wires are a problem.

I built a strain relief to fix the wire problems specifically to protect the brain from breaking. This piece would be put right next to the robot brain to hold the download cable in place using friction. It also can fit various sizes of wire including a smartwire for wire management. For example it can prevent the wires from getting in the wheels. Lastly, the strain relief can help keep the robot legal by holding the smart wires back. The strain relief fixes all of the wire issues.

I used the Tinkercad web interface from December 2018 to make the piece. It was designed to look like an open alligator clip with a flat bottom. I then made a rounded edge on the back which adds support for a flimsy top. The top was designed on an incline to fit various sizes of wire with teeth to grab the wire. The back is smooth for a smart wire. The top has through holes

for the cap pins. The pinholes were spaced to be able to snap into a vexiq beam. Then I made a recessed spot in the pinholes for the top of the cap pin making it smooth to push the wire in.

To build the piece in Tickercad, I first took a rectangle shape and I cut a cylinder in half and then I grouped it at an end of the rectangle. Second, I took some triangles and spaced them to make small teeth which clamps the wires. After I constructed the teeth, I attached a thin rectangle to the teeth. Third, I cut out a hole big enough for the cap of a cap pin in the top. Fourth, I used a smaller hole and put it for the pin part of the cap pin spaced for the vex iq beam. Lastly, I drew a small rectangle and put it at the back for the smart wires. I then 3D printed the piece and made many iterations to perfect the design.

In doing this project, I've learned several things about CAD. CAD is very cool! I enjoy drawing stuff on the computer and 3D printing it. I will definitely use CAD in the future because I am currently building custom boxes for projects at home. Also, CAD software can help my team by making custom parts to help our robot. Currently they are only decorations but I look forward to building bigger parts in the future. I will continue to use CAD in building robots, in doing future projects and in my career. CAD has taught me several important things and it has been fun to learn.