Make It Real CAD Engineering Challenge Sponsored by Autodesk

Wire Management

By Trevor Gittes Taplin

Wires are an integral part of vex, and robotics in general, allowing for centralized control of decentralized parts. With wires though, there is always the dreaded challenge of cable management--a challenge of trying to cable tie, hot glue, and will into place the unruly wires draping your robot like jungle vines. That daunting task was one I saw needed some smoothing out. So, I designed a wire clip to simplify the job.

The clip consists of a base with a similar design to a flat bearing, and two top loops that secure the wires. The space in the top loop allows the wires to be run perpendicular to the clip. The clip opens using the flexibility of plastic, allowing the wires to be put inside. It uses the “springiness” of plastic to close and stay closed. The clip can be attached using any attachment onto any structural component, given the clip uses standard sizes. In its application it could be attached at intervals to the side of a chassis that makes up the structure of an arm with a claw. The motor wire from the claw would be run down through the clips to the microcontroller. The clips are large enough that the wires can slide freely through them, but secure enough that they cannot come out of the clips.

I used Fusion 360 version 2.0.3800. First, I drew a side view of the clip’s loop on the right plane. Then, I extruded the loop out to the desired length. Next, I drew on the bottom of the loop and extrude-cut a rectangle that would become the gap in the middle of the clip. Finally, I drew the base on the same sketch as the gap and extruded it away from the loop.

This project taught me the importance of CAD software. I learned how valuable a skill it is to be able to design parts on a computer. It allows you to visualize your part and to test it before making it. I plan to have a career in mechanical engineering, so being able to use CAD software will prove helpful in my job. It will also be necessary since all careers are leaning towards the use of computers. Before I have a job though, CAD software can help in any club that uses mechanical parts. It can allow for rapid prototyping and make it easier to build mechanisms and machines. All in all, this project has shown me what my future as an inventor might look like.