

Wire Management

For this year's "Make It Real" CAD Challenge, we made a wire manager to help teams better organize the cables on their robot. We think this part is a better alternative to use zip ties because they get in the way of moving around wires, and you can't modify them after you use one since they can only be cut. This makes them annoying to deal with, so we believe our part can ensure that the cable management won't interfere with the robot's movement and won't lower the team's work and maintenance. Last year, our robot had many issues with wires getting caught in chains, so we resolved to make something this year that would help with this problem. Another plus that comes with this part is a cleaner looking robot because better-managed cables improve its looks and functionality.

In terms of how our part works, using it to manage wires on the robot is straightforward. The wire manager has two holes and a ring-like extension with a small slit to push wires through. This makes it so that the wire manager can be mounted anywhere on the robot using two screws. The part can hold multiple cables, and its small profile helps it stay out of the way of other moving parts.

We designed the wire manager using Autodesk Fusion 360 (version 2.0.9313) because it is easy to use and is a powerful platform for CAD design. First, we made sketches of the part, decided on the cleanest design, and then extruded them to the right shape in Fusion. Adding a few more sketches and extruding them, we produced the final part. We then used a fillet to make the piece look better. Then, we 3D printed the wire manager using a Geeetech A10M printer.

Designing the wire manager for this CAD challenge was beneficial to us because we learned how to CAD, specifically using Fusion 360, and we get to use this handy part that keeps our robot from sabotaging itself. Learning how to use CAD is useful because CAD software can be used to make custom parts fix other problems, making designing a robot much more straightforward. By learning CAD, we could also make a robot in CAD first, which our team did this year. We spent many hours designing and improving the robot in Fusion, but the time was spent well. Having the premade CAD designs made building the actual robot come with fewer problems, and we plan to use this approach in the future for both custom parts and to create robot

designs. Examples like these prove that CAD is quite useful in the engineering field because platforms like Fusion 360 make it so that we can easily change parts to improve them. We can also design prototypes but only use the final design in our creations or products. Once we have a prototype, we can test the sizing, how it fits together, and even do stress tests for heat, mass, tension, etc., based on the context. With this data, the model can be changed to fit the task at hand better. All of these points made CAD a useful tool in both robotics and life in general.