Make it Real Design Challenge

The part we created for Make it Real Design Challenge is a regular standoff component, but instead of the standard strait design which is fairly limited in its functionality, this design will be angled at 90 degrees, adding many utility functions when combined with its strait counterpart. The primary reason we chose to create this piece above many other of our considered options, is because of the challenges we have had with space on our robot for heavy structural pieces. We had built a lift tower with a fairly great height, but we had issues with sway at its maximum stretch. Vex does make parts to handle these stress issues, but the parts they make are simply too large for the design we were using. Due to this simple problem, we had to improvise with our spacing and this lead to new problems. We figured that, if Vex made a part that could do this support job in less space, then all of our problems would be solved. Alas, our prayers came to no avail. However, we remembered the REC foundation online challenges, where we could design this miracle part and maybe someday be able to use it where we see fit. Thus, sparked the creation of the angular standoff.

When we decided to finalize on the angular standoff, we also saw to the many other uses of the piece aside from tower bracing. First of all, you can use these angular standoffs for new designs in the field of claws, if the current vex season encourages it. They can be used alone or in numbers to grip the sides of the game pieces much more effectively than regular strait standoffs. As with any piece of the robot, it also adds structure when used as a bracing. Staying within the field of claws, it also can be used to divert the direction of the piece in the context of a passive claw. Secondly, the piece would be able to be used as a sort of hook feature. When using it by itself, or connecting two, it can be used to hold rubber bands while protruding off of the side of the structure, which can be used to steady a lift tower, or in the context of "In the Zone", a steadying function for a separate mobile goal lift. Third of all, as I gave a preview to before, is the usage of is as a structural bracing in almost every part of the robot. When building a piece that relies on a separate piece for support (i.e. a lift tower), you can attach the angular standoff to the structural piece and add far more structural integrity and steadiness of function. Overall, the angular standoff has a wide variety of uses, some that we haven't even thought of ourselves yet, it is left to the builder to come up with the solutions to the problems that they face.

The program that I used to make the design was Autodesk Inventor Pro 2015. The way the angled standoff was made was that first, I made a hexagon sketch, then extruded the part to half an inch long. After that, I put a hole to the correct specifications through the entire piece the threaded the inside. Next, I revolved the end of the piece to 90 degrees and took the threading off of it. Lastly, I copied the first piece that I had made and put it on the other end of the revolution. After that I was done!

After completing this project, we learned a great many things about three-dimensional designing, especially how powerful a tool like that can be. It is capable of anything from making plastic game dice to printing rocket components. In the context of a VEX robot, we can use the 3-D design software to create exact measurements of our components and then replicate them. For engineers, architects, inventors, and a multitude of other professions can all use 3-D printers, all of which could be a future career for me. In architecture, 3-D printing could be used to make models of possible future buildings; engineers could make parts from the printers; inventors could made create their invention from a 3-D printer. Knowing how to use 3-D printers would let me do all these things if I chose one of these career paths.