4768 A-J Make It Real CAD Engineering Challenge, Sponsored by Autodesk by Joel Ward and John Siy

For this years online challenge we have decided to develop a 3-d printed pin clip that is low cost and would save time and effort in a team's yearly build. This part and it's design would protect motor and sensor pins from bending and breaking. One variation is a sleeve that goes over a motor and motor controller connection.

We believe that motor pins breaking are one of the most occurring problems through robot construction. Breaking motor pins are a huge hassle because teams have to replace the small pins or just throw away the motor completely. Our final variation of a motor pin sleeve solves this common problem. While protecting motors from detaching from motor controllers and keeping motors safe from destruction, it is also saves a lot of money.

Our first draft of our design is a sleeve that overlaps both the motor pins and the motor controller/wire extension. However our sleeve is only applicable to two wire extensions, due to the lack of time. The sleeve is made out of plastic and comfortably goes over the motor pins. The sleeve was able to fit perfectly be we weren't able to keep the motors from getting out of the sleeve.

The final draft our design had two additional holes attached on the sides of the sleeve in order to attach the two wires together. These two holes can be accommodated with small zip-ties . These zip-ties prevent the sleeve from over extending and disconnecting, by going through the loops, and the two wires, which would be very useful in this years competition.

We developed this CAD design in 2016 Autodesk Inventor using parametric modeling. We started with the units of the pins and casing, and made rectangle slightly larger, so the connection could slide in. We then added a larger rectangle and filled in the space in between and extended it to cover the connection. We then added loops over the top using the same method with zip ties. For the single pin connector we did the same process, yet gave an ending to fully protect the pins.

From this project we learned a lot. We learned more about CAD and 3-D modelling. We also learned how to use it for real life and modern applications outside of classroom assignments. It was a great learning experience and helped expand our knowledge.