3D Printed Prosthetic

Challenge: I was tasked with designing a 3D printable prosthetic for a 9-year-old girl that was born with a deformity. I had to try and make the prosthetic as strong as I possibly can, as cheap as I possibly can.

Solution: Luckily for me there was a capstone group the previous year that did similar research and helped me narrow down my options. My research partner and I decided to use and modify an open source prosthetic that has already been tested and would work well for our needs.

Result: We were able to get a decently strong product by simply increasing the prints resolution, increasing the infill to 100% and tightening the tolerances of the design.

My Contribution: During the first year and a half of the project I did everything pretty much by my self with a little help here and there from my research advisor. In that time, I tested many different 3D printed infill structures, a resin infill, and coating the outside with carbon fiber. I designed and machined a compression chamber to better bond the test specimen and the carbon fiber. About halfway through the research project, I was allowed to bring in some help. As soon as I had a research partner, I took the roll as the lead and was able to delegate some of the responsibilities. I still conducted tests, 3D printed everything that needed 3D printing, and constantly communicated with the family about their expectations.