Project 2 Prototype Evaluation

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Answer the following questions about your prototype

Lectures

Which elements of your final design worked well?

One element that worked well from reports that I read from my other team members was that the main structure of the leg was very sturdy. I learned that during testing, our main leg piece was able to withstand the high jump tests and sustain only minimal compression/warping from the increase forced being applied.

Which elements of your final design did not work as well?

One element that did not work well was our makeshift foot solution to the rest of our leg. We also had struggled with climbing stairs with the leg due to our design being stiff and without freedom of rotation around the knee joint like a real leg. So while our leg design was structurally stable, it was not mobile or allowed the same amount of rotation.

Which additional aspects of function (turning, bending, climbing, additional load) or quality (comfort, support, removability) did you choose to optimize?

We optimized additional load and support the most. This includes choices such as adding internal structure to our main leg and using both friction and hot glue to create a tight seal for the piece when it slides it. We also accounted for user comfort by adding sponges to the knee area for where the user would rest their weight. This way, the user wouldn't feel uncomfortable with their knee pushing into the support structure that was only made of hot glue, board, and duct tape.

Describe the methods you used to optimize the aspects of function or quality that you selected.

In order to optimize the strength of the leg to support additional load we added internal structures that took away force from being forced straight down onto the sides of the leg. By adding a middle support beam, we were able to distribute the load a lot easier. We also added side supports that slotted into the main beam to further enforce it.

Do you think you were successful at improving the aspects of function or quality that you selected? Why or why not?

I think that our support function in the leg was very effective. One way that can prove this is that we had originally built the leg to support me, however, I was not able to attend the live testing and the group had to quickly pass the leg to the next person in order to conduct the test.

How could you further improve your design?

One way we could improve our overall design is to include things such as rotation at the knee for easier walking functions. Another way that we could have improved the foot was to use more board material or buy another board in order to have a dedicated foot structure. The problem was that we did not portion off enough board to have both a strong leg and stable foot.

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