Traumatic Brain Injury Reducing Army Combat Helmet

Team 6
Week 4
February 17, 2009
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**Work Completed:**

The week was primarily focused on building the first outer shell using the triangle design. Figure 1 shows the pattern used to cut out the Kevlar.

![Figure 1: Kevlar Cutting Pattern](image)

My job was to cut out enough Kevlar to keep pace with Kristin and Jim, who were both applying the triangles to the shell and adding resin.

Most of the initial layers used the same triangle size. However, it seemed tedious to use this same size for the larger layers and also created a bumpy surface due the number of cutouts required for one layer. Therefore, the next layers will use a triangle that is roughly twice the size in surface area. The increase in size will not affect the quality of the layering because as the number of layers increase the grooves of the initial helmet, such as the ear protrusions, begin to lose definition, and therefore the triangles will not bend as much. In addition, less triangles will make the final surface area less bumpy and more visually appealing.
Some time was also spent planning out the holes to be drilled based on the hole apparatus of the model helmet. Once the layering has been completed, this will be one of the first acts performed on it. In addition, the wax layer underneath the first layer of the Kevlar was attempted to be removed with sandpaper. Another layer of Kevlar may be added underneath to minimize the bulk of the helmet as a whole. However, it appears that the wax layer is attached very well. If this layer is to be removed, it would add several more hours of work trying to either sandpaper or cut it out. Or it could remain since it makes a pretty solid inner layer that may be easy to work with.

**Future Work:**

More Kevlar will be stenciled and cut for layering. When the helmet is finished, holes will be drilled based on the hole locations of the original helmet. As it stands now based on the current pacing, Kevlar cutting will most likely be a weekly routine for the duration of the project simply because of the amount of work left. This includes two more prototype helmets and all of the remaining attachments.

**Hours Worked:**

Seven hours were devoted to creating two stencils, applying them onto the Kevlar, and cutting the Kevlar out. Two hours were also spent trying to sandpaper the interior of the helmet to remove the wax layer that stayed on when the helmet was removed, then matching up the drilling holes with the original helmet. The total time worked this week was 9 hours.