Project Identification

Project Title: Human Integrated Gripping Device
Week 9: March 28, 2006
Team Report

Work Completed

The majority of the tasks for week 9 involved getting the prototype built. Phil began the week by cutting up the casing for the mechanism. With the help of Lyndon, Phil was able to cut out 4 segments of the casing of size ¼” and 9/16”. This was followed by hammering out of the aluminum inserts. These pieces were then sanded and filed to remove any excess material and smooth the edges. Though these finished products would have a downfall as they can only be used at the tips and only some of the small segments. This presents a problem in providing enough contact area and led to the development of the ring system which can be seen below in Emily’s work. Phil also worked to develop the ratchet mechanism on the index side with Emily as well as the release mechanism and ring system.

Figure 1. Casing Segment

Most of Lyndon’s worked revolved around the development of a release mechanism. Lyndon came up with several different variations. Most of the involved single locking mechanisms for each individual pawl release. Finally a suitable solution was reach when the team chose to use on the prototype was the Kevlar string and tubular casing design. The design worked by having extended tubing that would run to a fixed point outside the glove. Each pawl would have its own specific string/tube system and they would then all connect outside at the wrist. The strings then attach to a loop that would turn back toward the user into a locked position resulting in tension on the strings and release the pawls. Lyndon also helped in the index mechanics build as well as the casing and finding a overlying glove.
Emily worked on the other side of the ratchet mechanism the index finger. With the help of Lyndon and I, she was able to complete the index side mechanism by placing all the pawl, spring, ratchet and casing segments together. The mechanism is similar to the on the pinky side, the only difference being an extension to the middle joint.

Emily then worked a new idea on attaching the mechanisms directly to the glove by sewing it closely to the glove and then having steel rings on the outside of the mechanism. The rings act as contact points for the fingers by which the fingers can force closed the mechanics. A picture of the setup can be seen below:
**Project Review**

We had anticipated to have the prototype complete by the end of this week but we have not. We are well underway and have about 30% left to finish the prototype. I believe that it will be complete in the upcoming days and be testing the interface by Friday. This will allow us time all next week to make any minor adjustments to the interface for proper hand gripping.

**Future Work**

The next week as mentioned above will involve finishing up the prototype build. All we have left to complete is the pinky side attachment and the release mechanism. This can all be completed in the early part of this week and allow us to being testing the interface by Friday. Some other minor interface attachments will also be complete such as Velcro thumb attachment, grip tie, and high friction grip stops.

Table 1. Week 9 Timeline

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attach rings to pinky side</td>
<td>1 day</td>
<td>Tue 3/28/06</td>
<td>Tue 3/28/06</td>
</tr>
<tr>
<td>Attach ratchet to pinky side</td>
<td>1 day</td>
<td>Tue 3/28/06</td>
<td>Tue 3/28/06</td>
</tr>
<tr>
<td>Sew in tubing for release mechanism</td>
<td>1 day</td>
<td>Wed 3/29/06</td>
<td>Wed 3/29/06</td>
</tr>
</tbody>
</table>

**Hours Worked:**

Phil-7 hours
Emily-10 hours
Lyndon-7 hours