Identity
Assisted Leg Holding Device For Medical Procedures
Week # 2 (January 26th - February 2nd 2008)
Kade Etter

Work Completed
Since the last report, work has been completed on a simple, small scale prototype to further our understanding of the antigravity mechanism proposed in Dr. Rahman’s papers. The team met on Saturday the 26th at Mansfield Supply and purchased items to build a general prototype which can be seen below in Figure 2.1:

Figure 2.1: A small prototype.
While the prototype uses a clamp as the base, the location of the spring, as well as the wire used in place of the rope allows for a general testing and increased understanding of an antigravity mechanism. The prototype has not been used in an actual weighted situation however since the main goal was simply to understand the relationship of the spring and the rope in relation to the weight (which we applied using our fingers). The two springs which were bought from Mansfield Supply did not come with their associated spring constants so Jenny and I used the Ticius Olsen machine to determine the force (lbs.) placed on the spring at given lengths. The spring equation $F = -kx$, where $x$ is the distance stretched to determine the spring constant. Figure 2.2, shown below, is a photo of the testing set up.
In addition to working on the prototype, I also took care of ordering the leg and foot stirrups required for our design. By talking to the sales representative for the used medical supply company Scientific Liquidators, the company price matched two single stirrups to the price their website set for a pair. Additionally, our budget had assumed a price of $375 for the leg stirrups, however again the price was lowered to $175. This meant a combined savings of $200 from our original budget estimates. This money should be useful if a mistake is made later on and a part needs to be replaced.

Following the completion of the prototype, the team was able to come up with some primitive ideas on how to use an antigravity mechanism given the additional constraints of our project. We shared these results with Dr. Enderle during an informal meeting on Wednesday. At this time, we also inquired about the range of force that could be required of the practitioner. Also, Dr. Enderle indicated that a locking mechanism could be used to ensure that the leg device stayed at the required level once it was positioned properly.

**Future Work**

In the next week, all the group members will individually come up with ideas to shape our new design from the knowledge we have gained building our prototype. I will complete a new budget excel file and update the new excel sheet as we complete orders to have a more precise idea of where our budget stands. I have also been tasked with making decisions about what we will be using to serve as the medical table. We have several options as to how to proceed, one is to order an actual table from a medical supply company, to order half a used medical table, or buy an old desk and use that in place of a medical table. We will be meeting as a team at the surplus sale at UConn. this should allow us to purchase an old metal desk to act as the medical table. This will allow use to spend more money on retrofitting the table to our needs then buying an actual medical table which seems like a waste. Finally, the team will review our timeline and update it as required for our new design.

**Project Review**

Work on the project as begun to pick up as more and more of the individual pieces have started to come together. Upon reviewing our timeline and budget, the teams has a better idea of the
direction of the project and the work the needs to be completed. Upon completion of the antigravity design, the actual building will begin. Below is a four week timeline that maps out individual components that need to happen within a given week to keep the project on schedule.

Week 4
- Math calculations for the weights of body parts
- Sliding connections with pin for support bar
- Order springs at known constants
- Table shopping
- Receive stirrup pieces

Week 5
- Retro fit table, attach bars, bearings
- Retro fit stirrup pieces
- Design a mechanism for adjusting the cord length

Week 6
- Mount springs
- Install small parts
- Test linear bearings

Week 7
- Attach foot/leg support devices to mounting bars
- Test cord movement and spring
- Test overall force required to move support bar

Hours Worked
Hours spent on project between January 26 and February 2 2008, Week 2: 15