

## Animating a Robot

### 1. Project Goal:

The goal of this project was to further my understanding of rigging in OpenGL and to help me understand the basic concepts of animation.

### 2. Project Description:

Over the course of my project I learned how to create objects inside of OpenGL and then apply a node to them that would allow those objects to be fitted together in space. From there I learned the basics of OpenGL animation using glPushMatrix, load identity, and basic transformations like rotate and translate. I was able to eventually get it all working after a ton of research into the basics of OpenGL animation.

The biggest challenges I faced during this project was my lack of understanding about how rigging works and the very tedious guess and test work of proper sizing/increment of values. Since this is my first graphics class it was a doozy, but like all challenges I've faced so far I just had to do a lot of research to figure out how rigging works, standard layout and creation of rigging, how their linkage relates, what is animation in OpenGL, how do I move my items, but the item I spent the most time on researching lectures on these different ideas to further my understanding. Through a lot of this research I learned common build tactics, basic/easy to understand naming schemes, how to use nodes to link child objects with parents, moving items relative to other moments to ensure "fluidity".

### 3. Results:

Overall I was successful in most of the tasks I set out to accomplish I created some basic movements in this project it was raising hands and leaning the head forward. A slightly more complex movement where a leg is raised but below the knee keeps itself down. A complex movement of a squat that includes a bending at the elbows, knees, and hip area. I also tried to do the jump like you recommended and I got most of it. However, due to some unforeseen events with a group project in another class (2 team member did no work all semester so we had to scramble to finish) I didn't get it working how I would have liked it.

### 4. Summary/conclusion

In the end I was able to get it working and pulled a lot of concepts away like working with identity multiple identity matrix, rigging with the use of a node structure, and how hard it is to animate without key frames.

Main research material [www.khronos.org](http://www.khronos.org), [www.learnopengl.com](http://www.learnopengl.com), [www.ogldev.org](http://www.ogldev.org). I did have more but they didn't provide enough information for me to include.

I would like to add that I greatly underestimated how difficult this project would actually be. I knew that it would be hard, but spent ample amounts of time researching and learning how this works and it looks like a moving potato ... I'm glad that I did finish though. Also I'm glad you recommended jumping after doing the squat I couldn't imagine how I would have made it waltz correctly. I had set

up a few different cameras with the intent of being able to adjust the dance animation as it went but hey you can at least see the other animations better.