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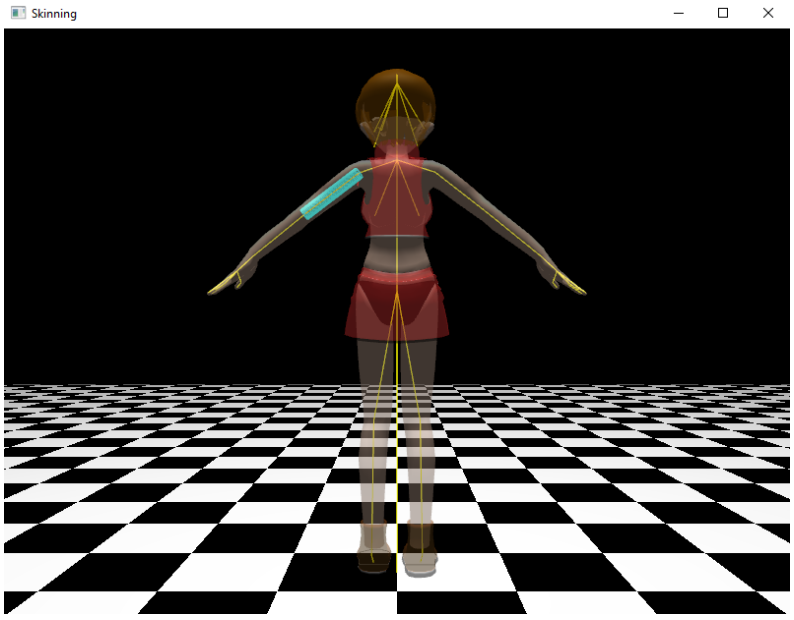
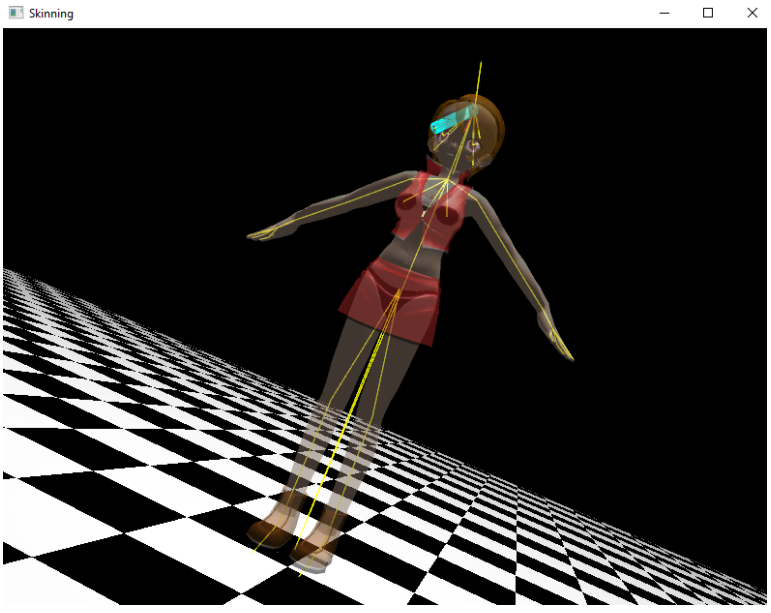
So far for assignment 4, we were able to implement the bone and joint parsing completely, and we are currently in the process of building a solution for bone picking.



We have coded everything that needed for bone picking to work, but our current implementation is very buggy, not recognizing some intersections as valid and therefore not highlighting the desired bone. We are currently in the process of debugging for the error in our intersection calculations.



So far, the most difficult part that we have had to implement is most definitely the ray cylinder intersection. As it is almost purely mathematical calculations, one small mistake in arithmetic can cause the entire code to behave incorrectly.

Implementations:

Bone Parsing - We load the joints from the pmd file and create them as bones. We also layout the bones in a tree structure to more easily create the bone's local orientation matrix.

Bone Picking - We unproject the mouse's coordinates into a ray in world coordinates and convert the ray into a specific bone's local coordinates. By doing this along with projecting onto the x-z plane, we can see if the ray intersects with the cylinder with an infinite y. Then we check within a range, specifically the length of the bone, to truly prove that there was an intersect. We do this to every bone, and in the case that the ray intersects with multiple bones, we choose the bone that is closest to the camera.