CSC 240 Computer Graphics
Day 15: Hierarchical Models

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Midterm

Mean grade = 80
Standard Deviation = 12
Median = 82

$80 \pm 2 = B$
$68 \pm 2 = C$
$90+ = A$

At most 1/10 of the total course grade
Q. When you’re using hierarchical models, what counts as the origin? (For example, if you’re rotating a virtual object and all of its subparts, what point will it rotate around?)

A. Each Object3D has its own coordinate system, with origin at the position of that object. A child object rotates around its parent’s origin.

Q. What is a mesh?

A. Roughly, a visible object. Visible surfaces are created by polygon meshes. We made a simple one for our pyramid lab.
Q. In the coding demo, where is the location of lhip and rhip and how does three.js determine where to put virtual objects if you don’t specify the location?
A. Position defaults to (0,0,0) unless otherwise specified

Q. I’m a bit confused on how lhip and rhip are rotating around the correct point (since it doesn’t seem like we defined where they are in relation to body)
A. Lhip and Rhip are located at their parent’s origin

Q. Can you explain why adding lhip and rhip fixed the center rotation on the legs?
A. If we rotate around the body origin, the legs scissor
Q. Why is rotations another reason for having a virtual object in the scene?
A. As seen on the previous slide, having virtual hip objects allowed the legs to rotate properly.

Q. What do you mean by virtual object (Is that just a hierarchical object)?
A. A virtual object is one that has no visible pieces (i.e., no mesh)

Q. Why are rotations applied before translations?
A. Three.js has a fixed order that it uses.

Q. How do we use the cos and sin with the y rotation as a counter? Can you explain how this works?
A. `body.rotation.y` increases steadily over time. So it functions as a counter.
Your Questions
Lab 8: Robot Arm