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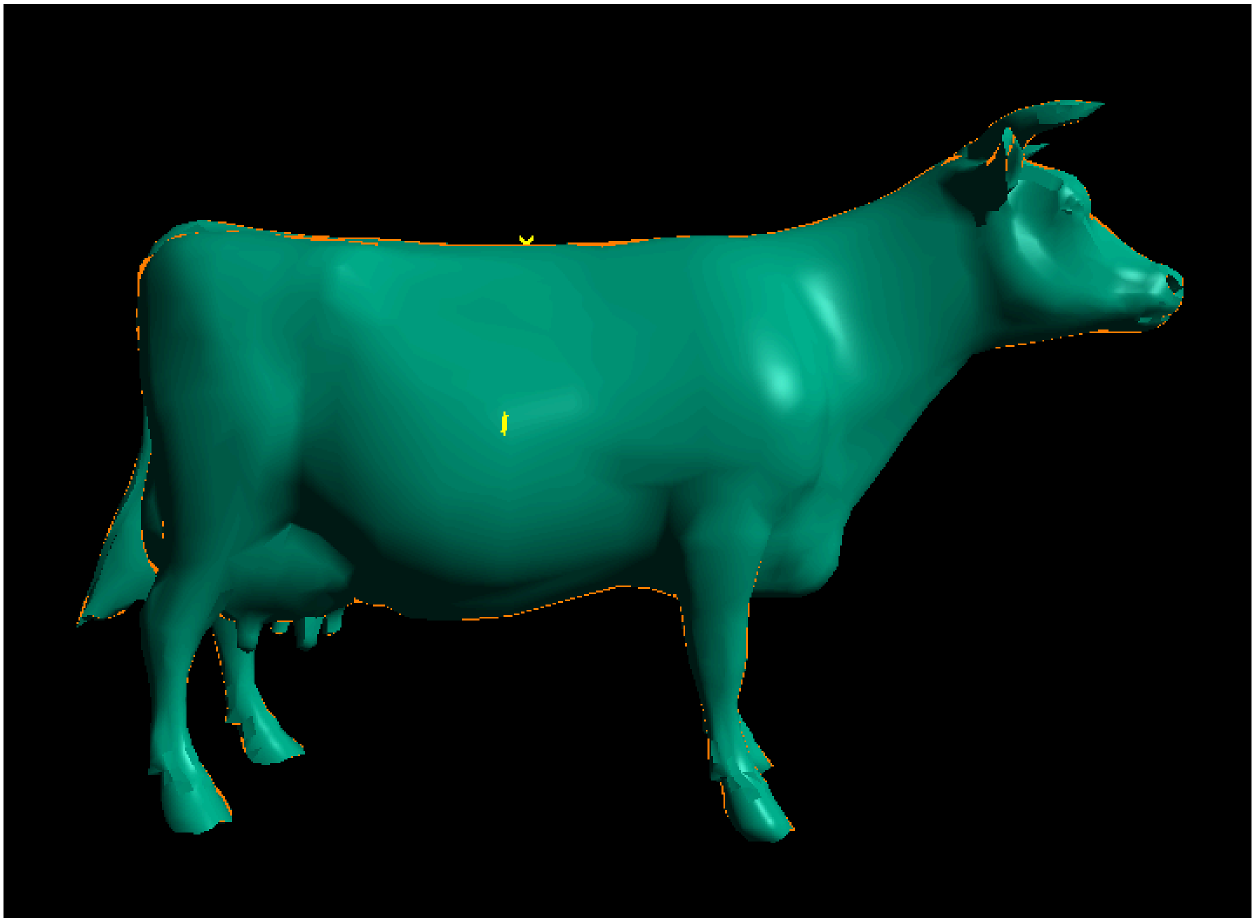
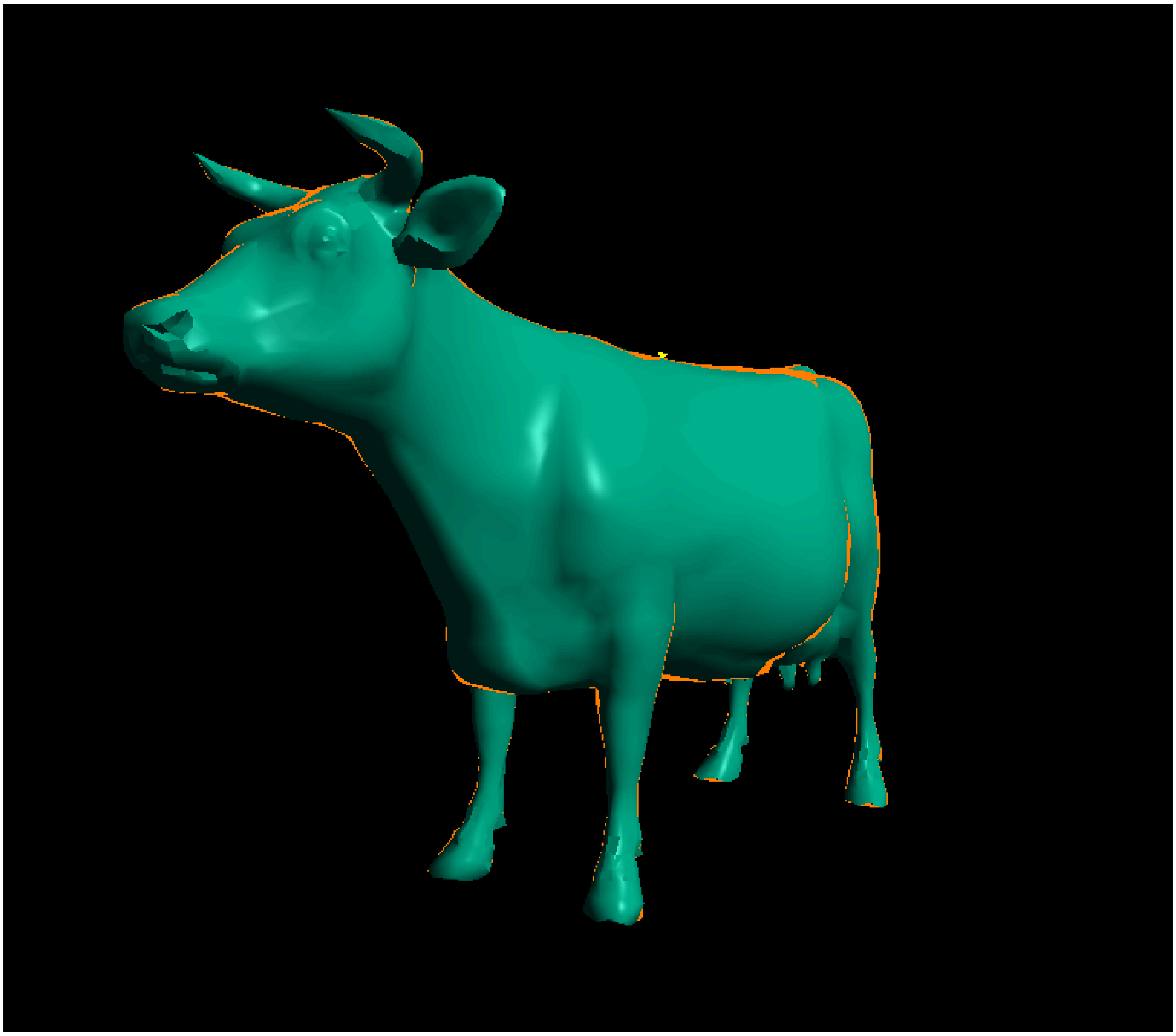
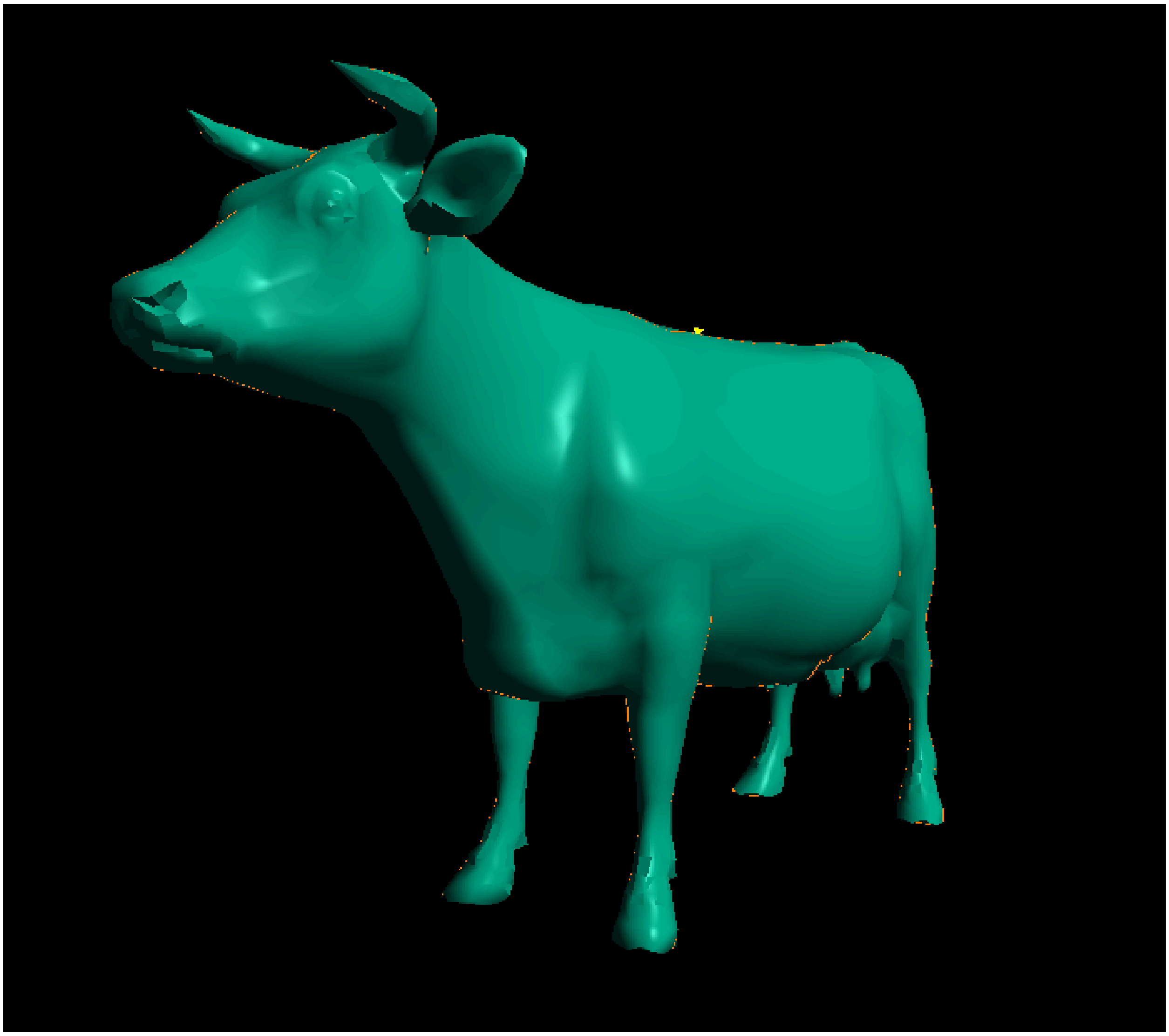
Project #7 - Shaders, II

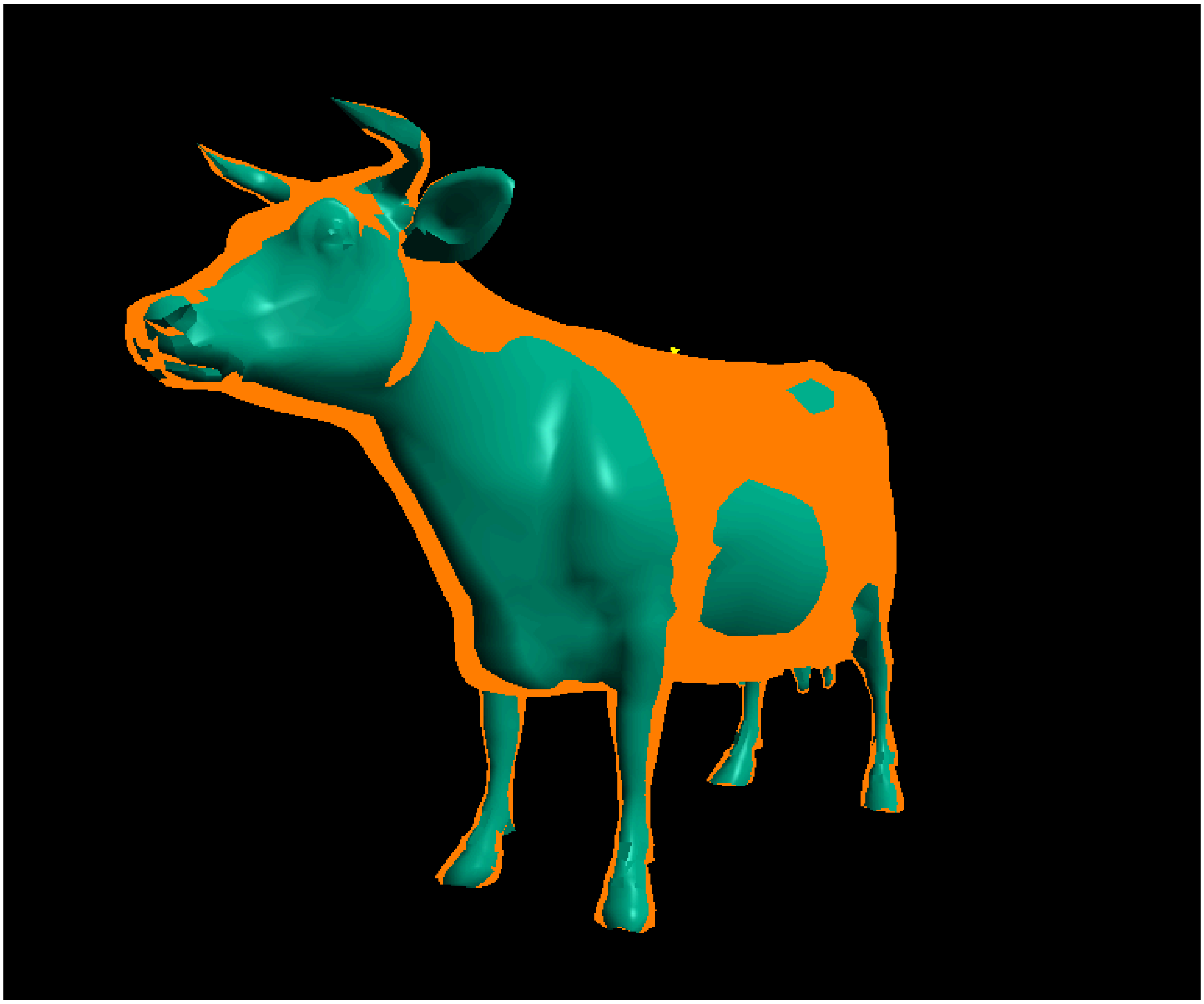
What I did:
First off, I started by adding my cow OBJ file and the required vert and frag skeleton code files into the project. I then added all of the includes I would need and declared global variables for the cow, GLSL shader program, and silhouette toggles and tolerance values. After that, I created a new display list for the cow object and loaded the OBJ model. Next, I initialized the shader in my setup code, switched the program on in the Display() function with Silh.Use(), and passed the required uniform values for rendering the lit surface, enabling silhouette mode, and setting the silhouette tolerance. Once the shader setup was done, I updated the silh.frag file so that it computed per-fragment lighting correctly and included a valid silhouette detection step. This involved normalizing the normal, light, and eye vectors, calculating ambient, diffuse, and specular terms, and adding the silhouette test based on whether the fragment's normal was nearly perpendicular to the view vector. After the shader was functioning properly, I added keybinds to turn the cow OBJ and silhouette shader on and off with keys 1 and 2, and increase and decrease the shader's tolerance with keys + and -. This results in my final display of a greenish-blue cow with an orange silhouette shader applied to it.

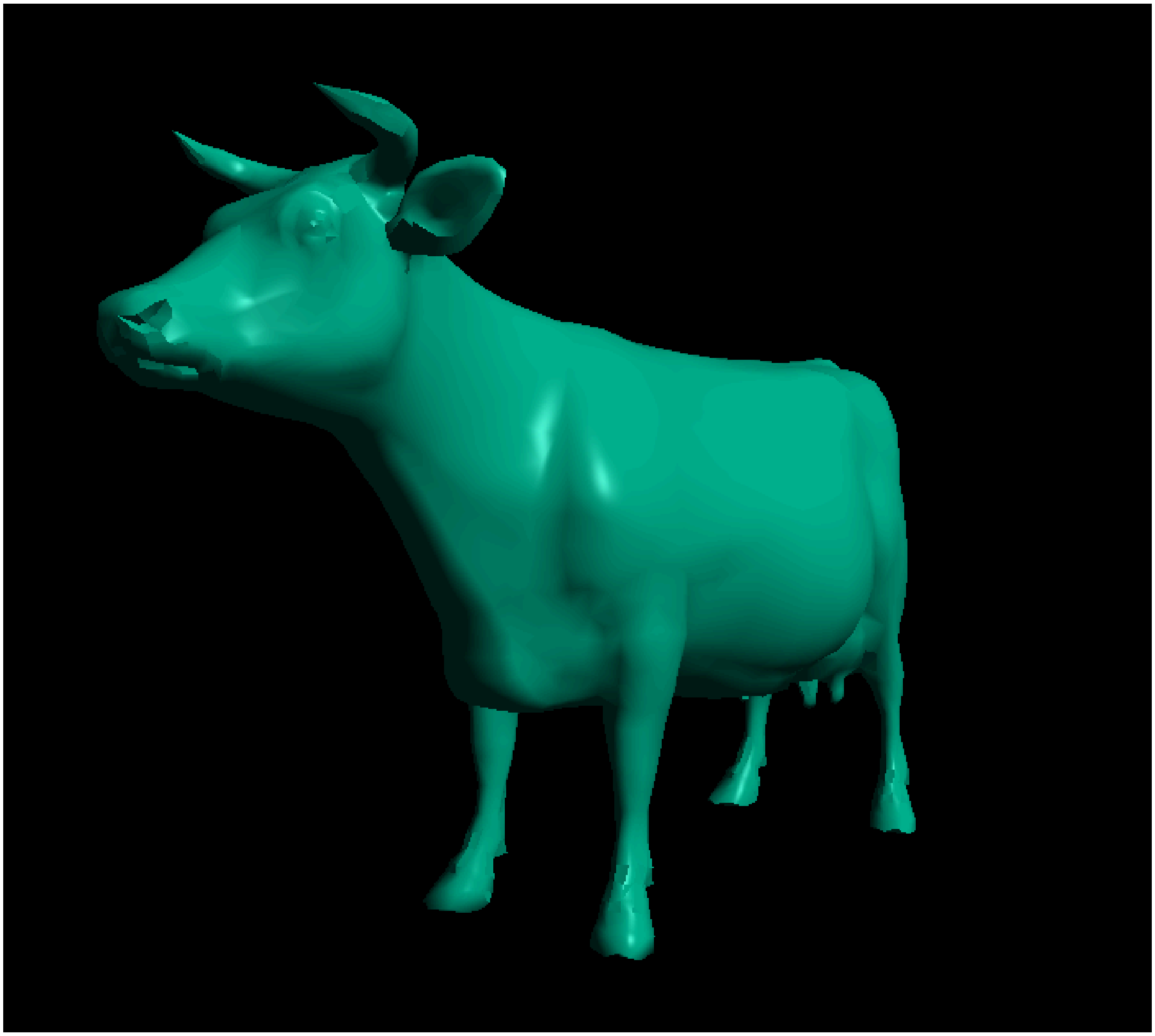
Screenshots:











What convinces you that your animation is indeed doing what you set it up to do: I know my animation is behaving exactly as intended because the rendered cow clearly responds to every component of the shader and control system I implemented. The surface shading changes dynamically based on the light direction, confirming that the per-fragment lighting calculations are working. The silhouette effect appears along the expected edges of the model, and adjusting the tolerance variable immediately changes the thickness of the outline, showing that the shader logic is also working correctly. This proves that the animation pipeline is functioning correctly and the shaders are doing what I set them up to do.

Video:
https://media.oregonstate.edu/media/t/1_178rstl0