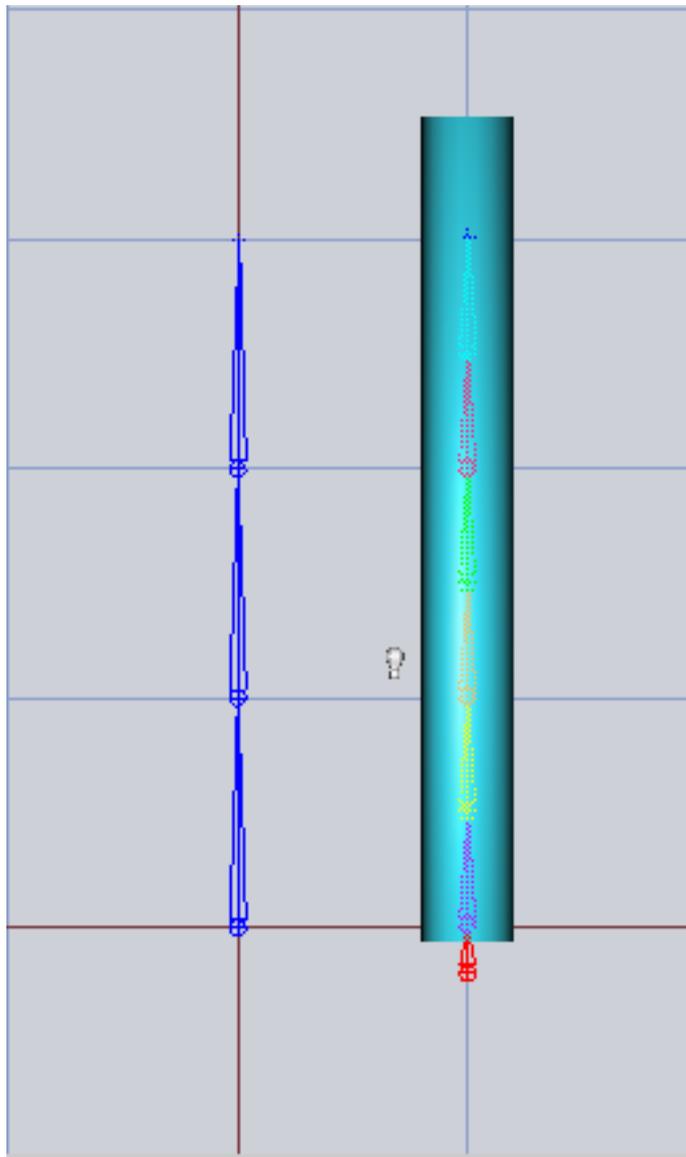


## SKINNING AND PAINT TUTORIAL

The purpose of this tutorial is to introduce you to character skinning and painted strengths.

1. Open the project, SkinningAndPaint.prj

This is a finished version of the Constraint2.prj tutorial with a cylinder added to the project.



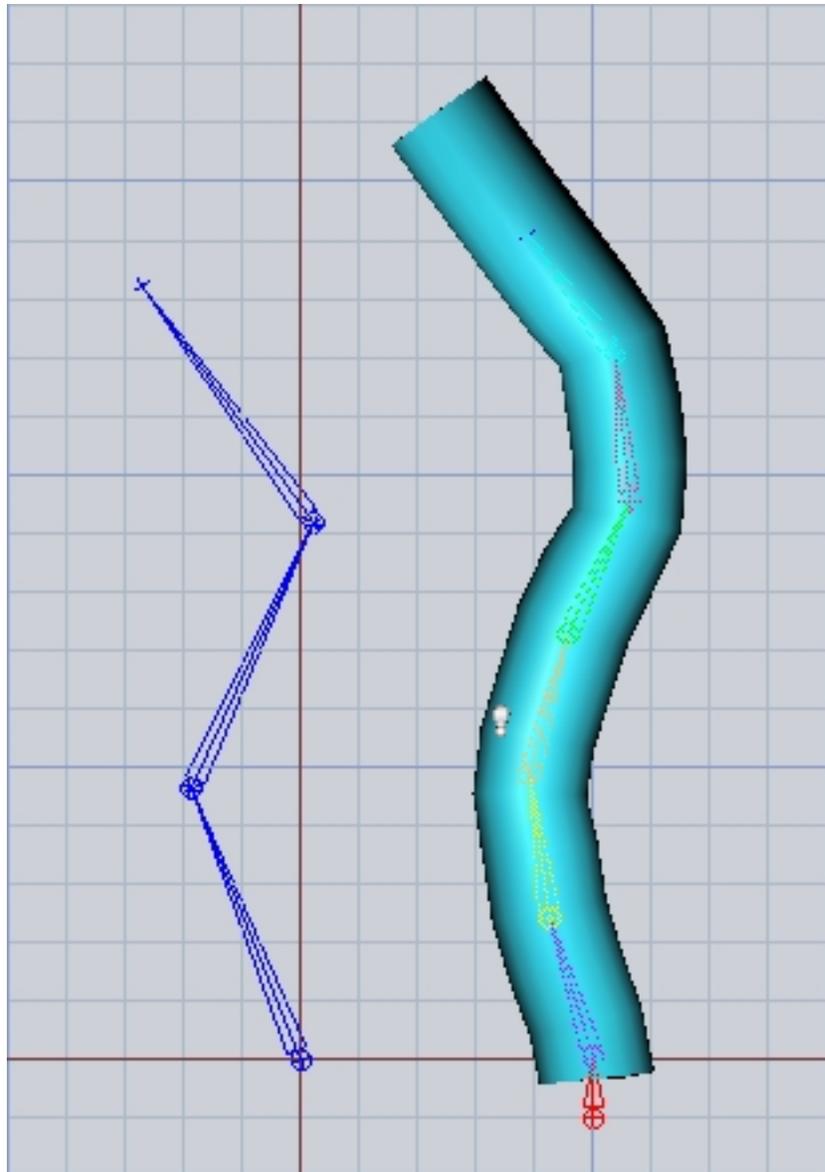
Front View with Controls, Bones, and Cylinder

The previous version of Universe and previous versions of EIAS required you to link the bones to the skin and then create a bones deformation region. Universe 4.0 has a much simpler skinning system and its much faster too. You just bind the bones to the skin with one step.

2. Select the top of the bone chain, “Bone 1”, from the Project window.
3. Choose “Bind Skin to Skeleton” from the Character menu
4. Click on the Cylinder in the Project window or a View window.
5. Hit CMD-. or esc to terminate

That’s it. The bones are now bound to the skin (cylinder).

6. Use the Low, Mid, and High Back Controls to manipulate the skin

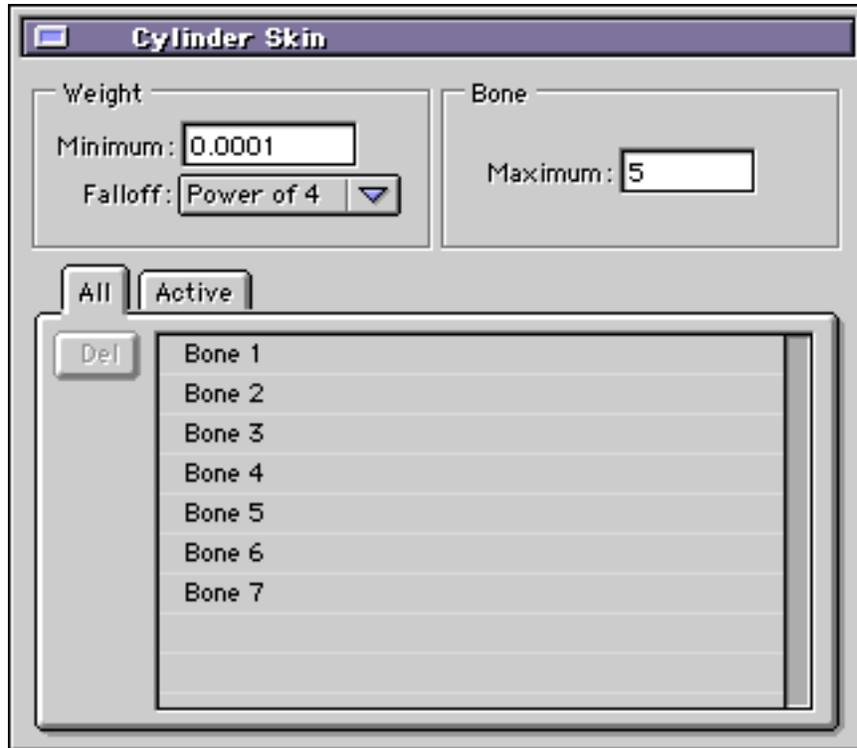


Front View with Bound Skin

When you are done playing, set the controls to a position similar to that shown above.

### **Skin Editor**

7. Select the Cylinder from the Project window or a View window and choose “Skin Editor” from the Character menu.



Skin Editor for Cylinder

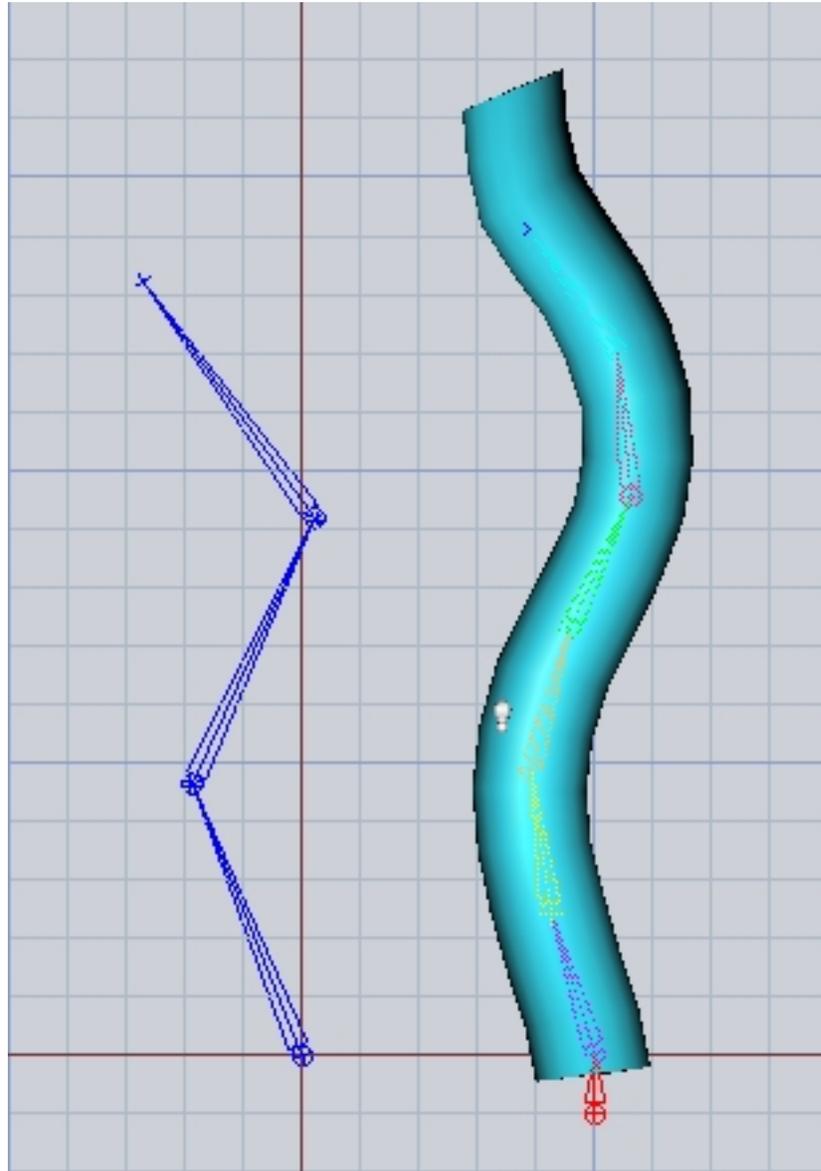
The editor has a list of bones that are bound to this skin under the All tab. The Active tab shows the same list except that bones that have their “Active” buttons turned off in their Bone Info window won’t be listed.

The Bone section of the interface has an edit box, “Maximum”. This controls the maximum number of bones that will affect any one vertex in the skin. Larger numbers give better averaging of the bones effects over the skin, but larger numbers also slow down the calculations.

The Weight section of the interface has an edit box, “Minimum”. This is the minimum strength, lower than which the bone will have no effect. Essentially this is a cut-off value that prevents the skin engine from running calculations on bones that have nearly no effect on the skin.

Falloff “tightens” or “loosens” the influence of the bones on the skin based on the distance from the bone to the skin. The lower the falloff value, the looser the influence becomes.

8. Change the Falloff from “Power of 4” to “Linear” and observe the change in the skin.



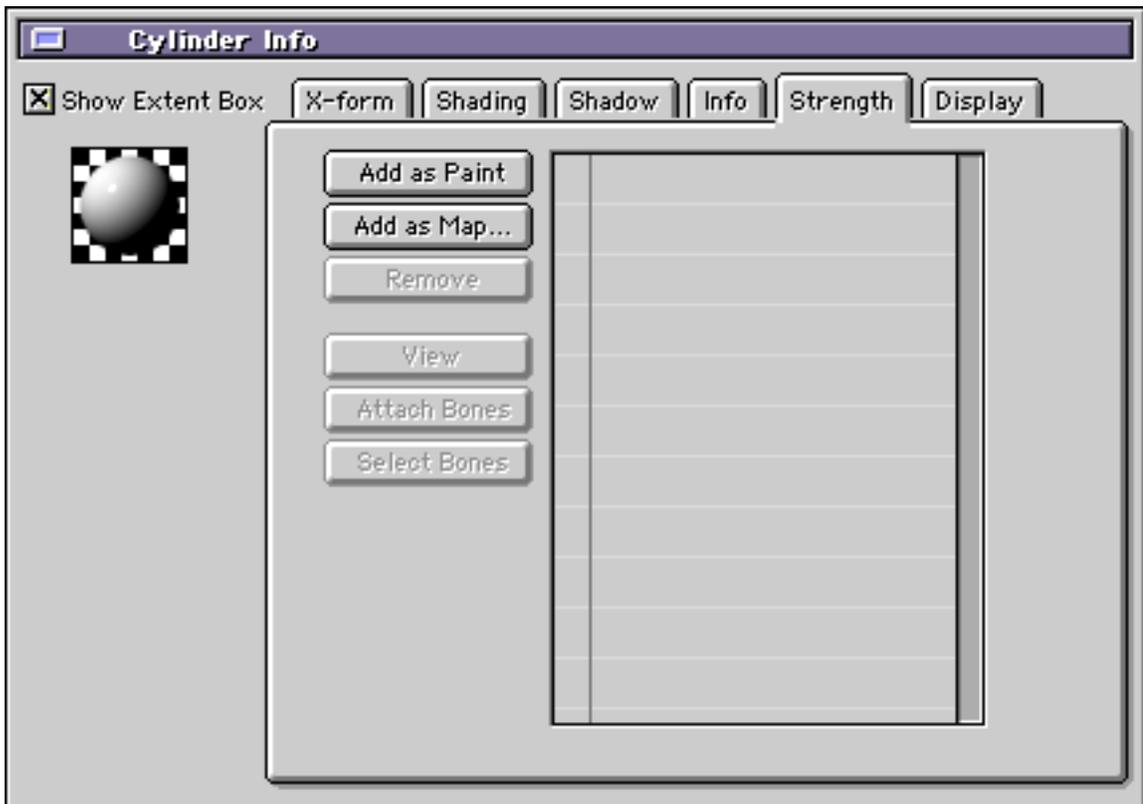
Front View: Linear bones mapping

The skin is much smoother now.

### Painted Strength Maps

Let's use the new paint tool to reduce the influence that some of the bones have over certain parts of the skin.

9. Double-click on the Cylinder group to bring up its Group Info window.
10. Click on the Strength tab to bring it forward.

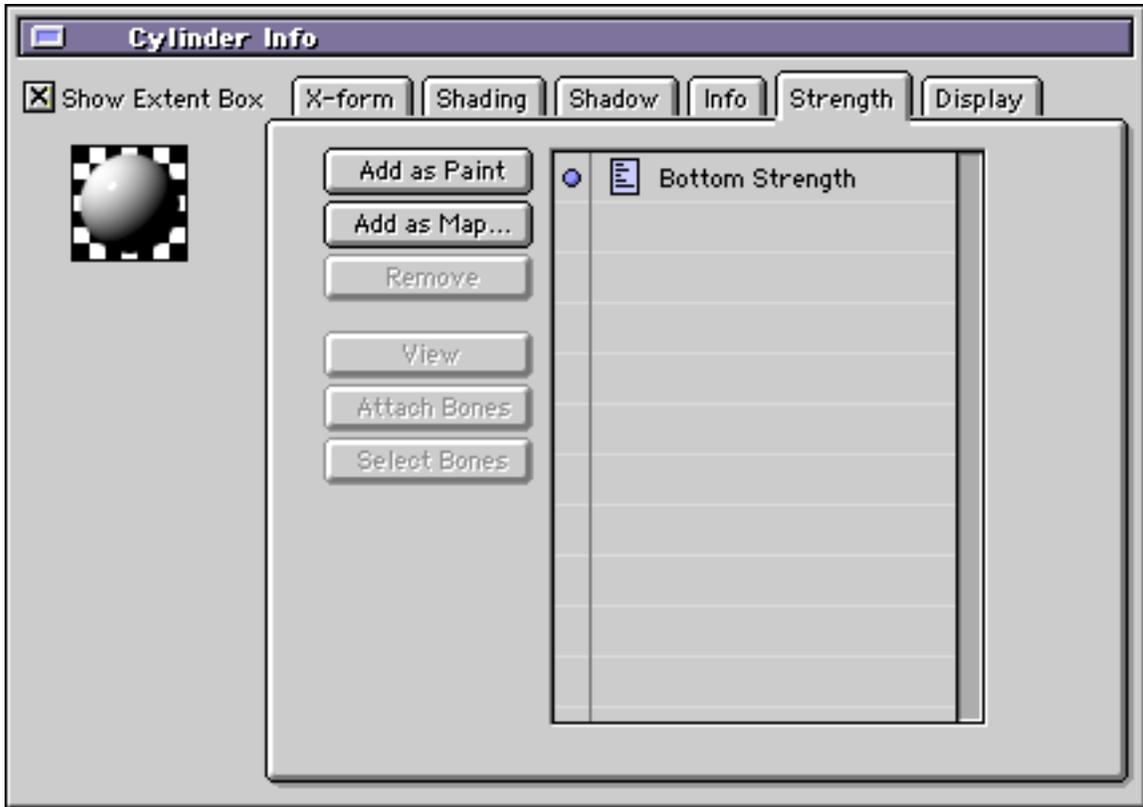


Group Info window: Strength tab

Strength maps can be added as paint or as a texture. For this tutorial, we will be using painted maps.

11. Click on the button, "Add as Paint".
12. Name the new map, "Bottom Strength"

The Strength list box now contains a new entry for the Bottom Strength paint map.



Group Info window: Strength tab

The Strength List can contain as many maps as you choose to add. Each map can be associated with any of the bones that are bound to the skin. This means you can use the maps to control which parts of the skin each bone affects.

Let's use the Bottom Strength map to keep the bones from modifying the bottom of the Cylinder

13. Go to the Project window and select Bone 1 through Bone 5.

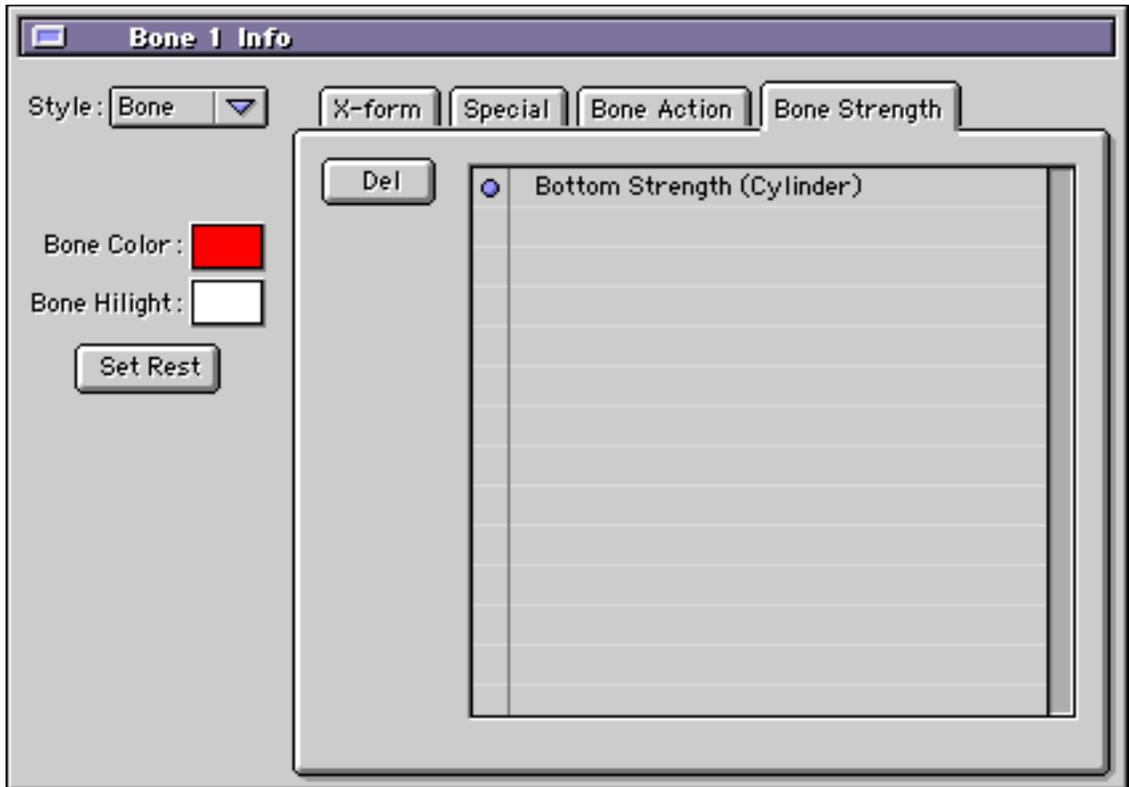
We are only going to attach the 5 nearest bones to the bottom of the Cylinder to the strength map since we know that the maximum number of bones affecting the vertices of the skin is 5 (see the paragraphs just above step 8 for more info on this).

14. Go back to the Strength tab and select "Bottom Strength".

15. Click on Attach bones.

The bones are now associated with the Bottom Strength map. There are two ways to verify this. You can click on the "Select Bones" button. This will highlight all of the bones in the project window that are associated with this strength map. Or, you

can open the Bone Info window and look in the Bone Strength tab. This tab lists all of the strength maps associated with this bone. The map name is listed and the skin name is shown after in parenthesis.

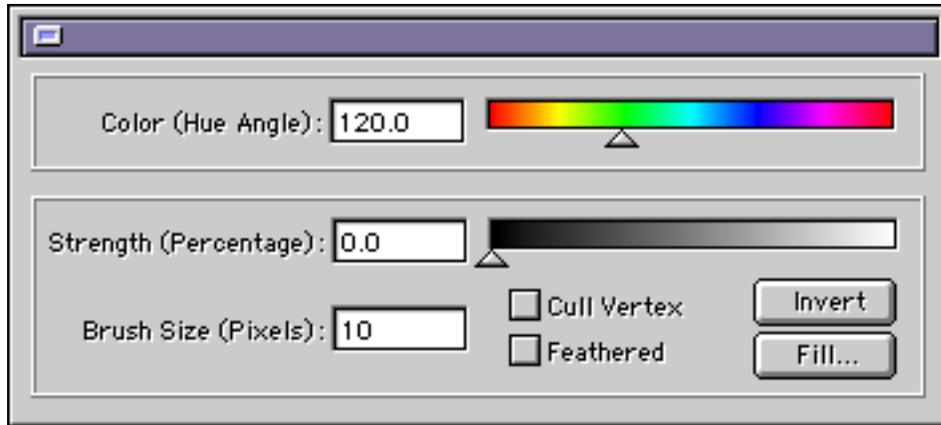


Bone Info window: Bone Strength Tab

Now that we have created a map, lets put some paint in it.

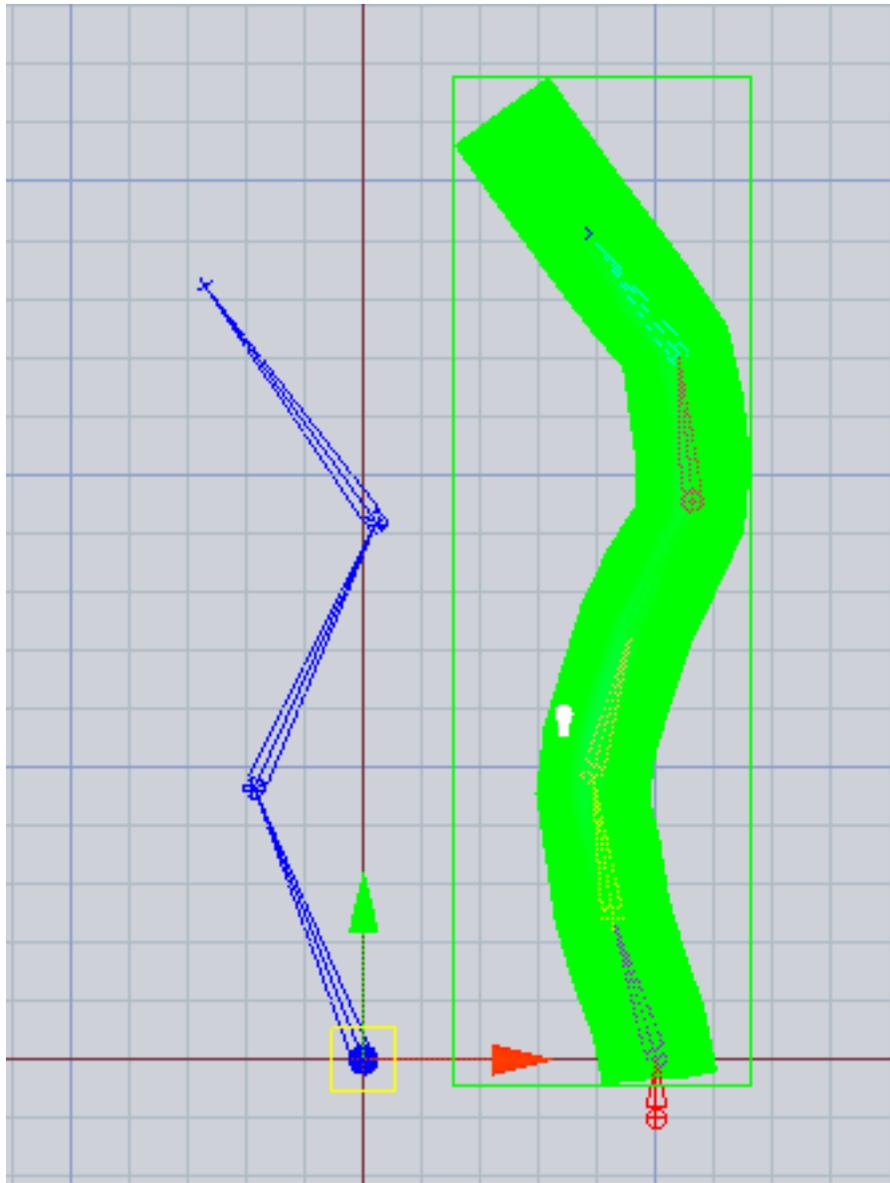
16. With the Bottom Strength map selected, click on the “View” button.

The Paint Palette pops up and the skin turns bright green.



Paint Palette

The skin is green because the default paint value is 100%. That is, the map defaults with the bones having 100% influence on the skin. The Color at the top is the hue used to indicate 100% strength. When you paint on the skin, the color will darken toward black to indicate 0% strength. The initial color chosen for 100% is just for display. Choosing red or blue instead of green won't affect anything. Pick whatever color you are most comfortable with.



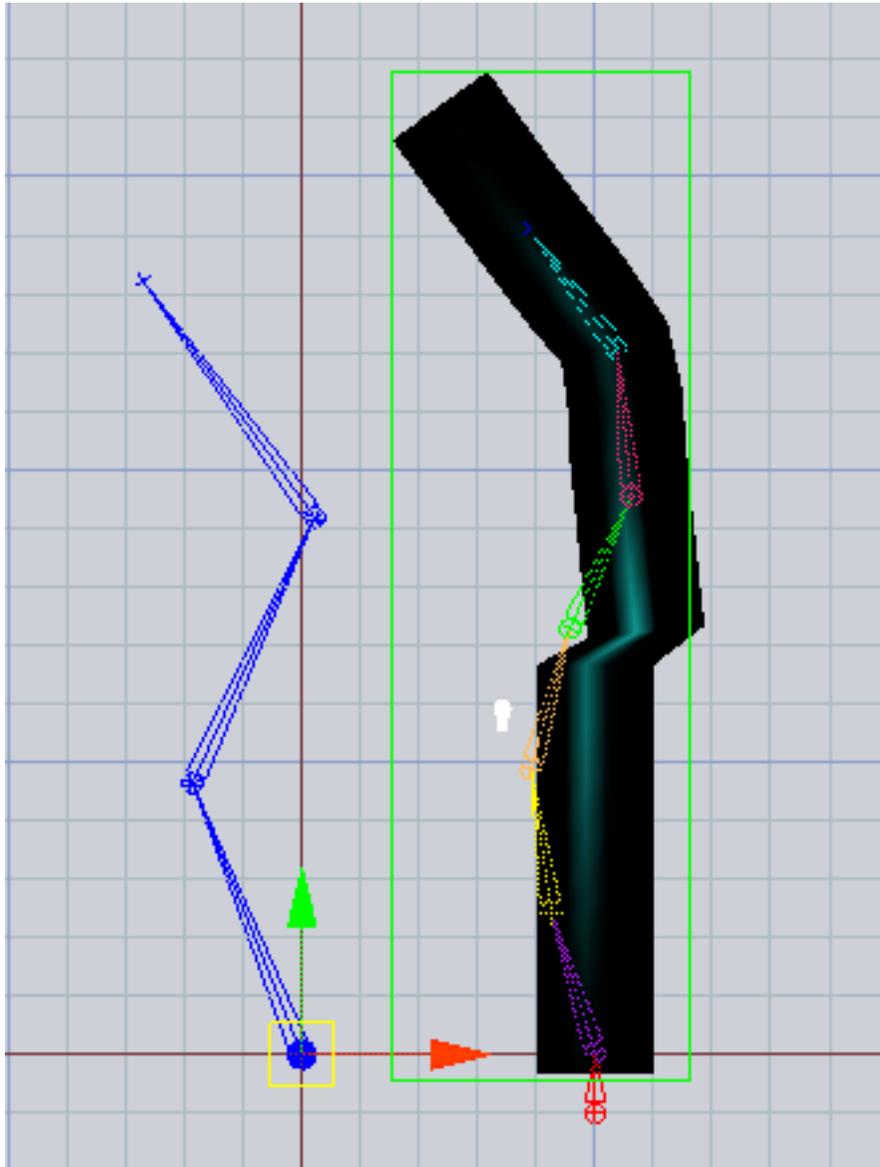
Front View: Paint Palette Open

Strength (percentage) is the actual strength the paint brush will apply. When Cull Vertex is on, you are only painting the ‘front’ of the object. The Feathered checkbox enables a falloff in strength from the center of the brush to the outer edge.

Note: you are painting the vertices of the polygons. This means that you won’t be able to achieve a ‘smooth’ painted look if you model has few polygons.

17. Click on the “Invert” button.

The Cylinder turned black, indicating that all the vertices have 0% strength with respect to the 5 bones that are attached to the map. As you can see in the view windows, the lower 5 bones no longer affect the Cylinder.



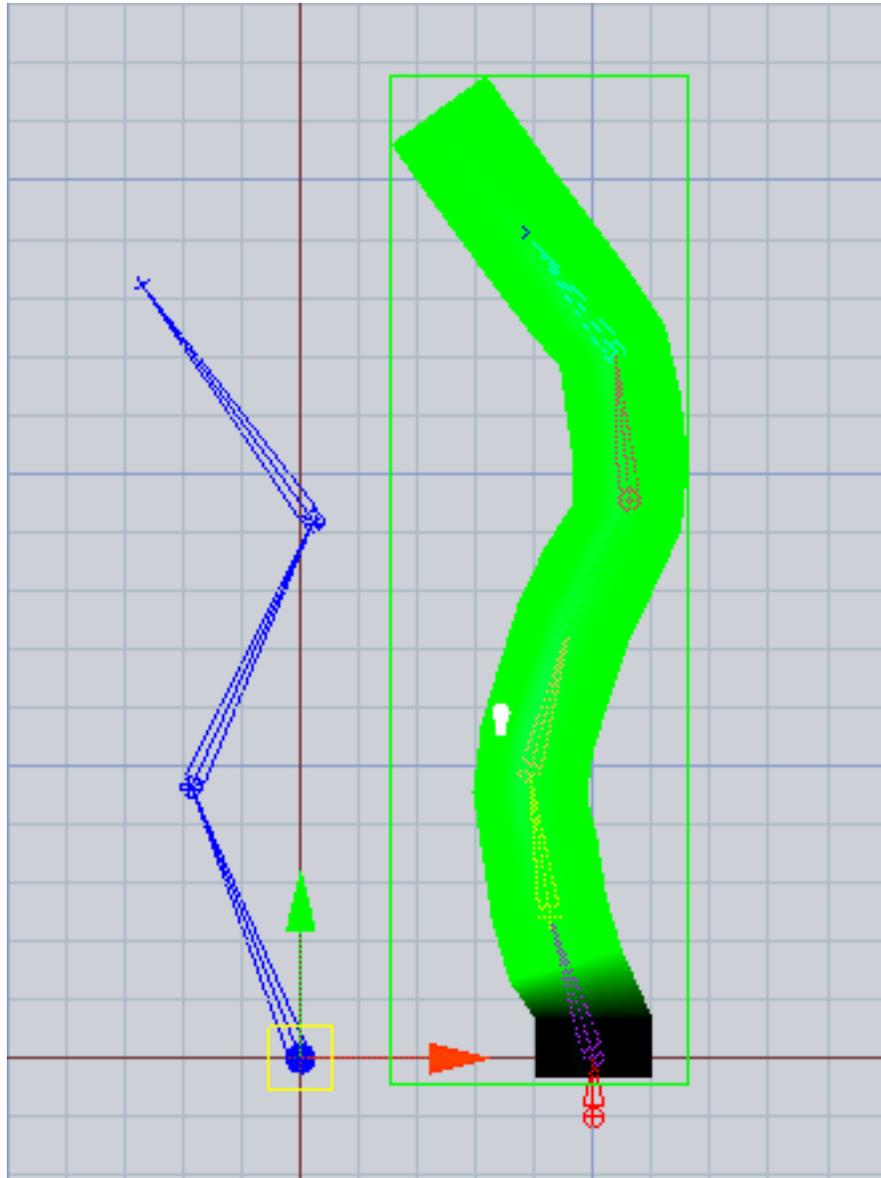
Front View: Inverted Strength

18. Click on the “Invert” button again.

The Cylinder returns to its former shape.

It’s time to actually paint on our skin.

19. Make sure the Cull Vertex checkbox is off
20. Paint across the bottom of the Cylinder just a short way up as shown below.



Front View: Bottom Painted

Notice that the polygons in the skin moved as you painted them indicating that the bones were no longer affecting them.

21. Return to normal mode by closing the Paint Palette.

The cylinder returns to its normal color and you can now play with the Back controls again to see how the paint affects the bone's influence.

Try adding a second painted map. Exclude the top of the cylinder from bone influence.

Another thing to consider is that there really isn't any reason at all to display the bones in the view windows once the painting is completed. The controllers you have build will supply the necessary 'handles'. The bones are just clutter. Go ahead and turn off their visibility checkboxes in the Project window.