

Using Physique to Create Clothing for Better Bodies

Part I – A Pair of Shoes

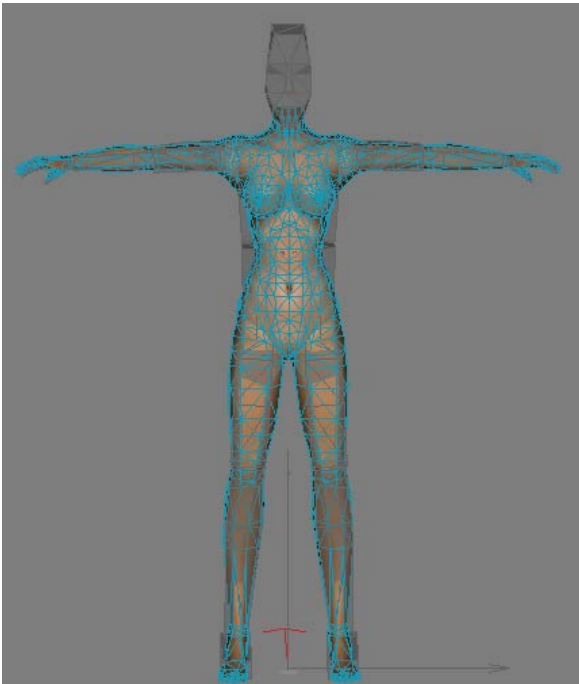
This tutorial will explain how to use Physique to create a pair of shoes that is compatible with Better Bodies. You will need the following:

- 3D Studio Max 4 or 5 with Character Studio
- The .MAX files of the Better Bodies models
- The vertex weighting diagrams
- A model of one of the shoes you want to make

The last three should be available with this document.

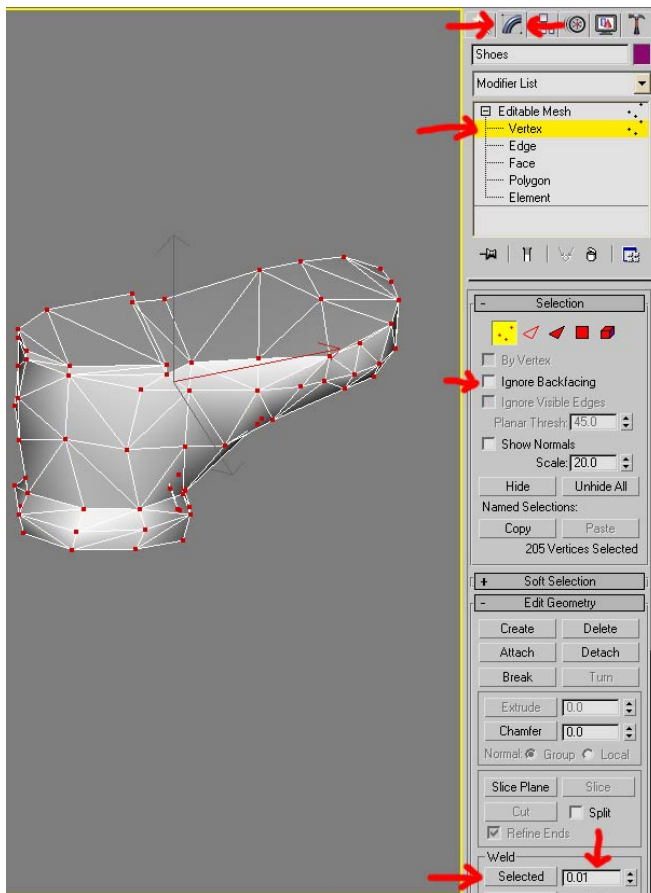
Now it's time to get started.

First, load up either the male or female Better Bodies mesh in 3D Studio Max. You should see the body along with a sort of skeleton poking out of the body at different places, like so:



Don't worry if your body is white or you get a missing texture error. That's not important. The skeleton determines how the body is animated. In order to move the body, the skeleton is animated, and then the animations are applied to the body. However, 3D Studio Max first needs to know which parts of the body correspond to which bones of the skeleton. This is done through the process of vertex weighting, also called physiquing or skinning. This tutorial will teach you the basics of vertex weighting.

Now, let's import that shoe. Go to file->import and find the shoe.3ds file that came with this tutorial.

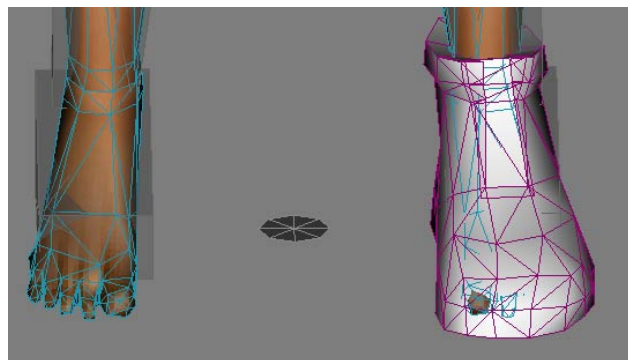


Whenever you import a 3DS file, it almost always breaks the mesh up into several pieces. In order to undo this, you need to do the following. First, select your mesh. Then click the modifiers tab, then open up the "Editable Mesh" modifier and select "Vertex." Make sure "Ignore Backfacing" is unchecked and drag a box around your mesh. Now, down where it says "Weld," change the value next to the "Selected" button to the smallest non-zero value that you can, then click "Selected." This should make your mesh all one piece again.

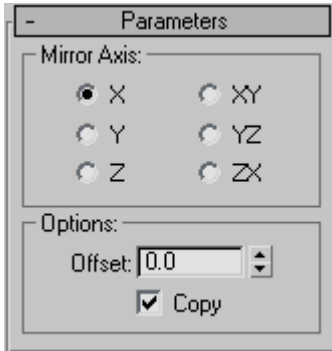
Now you need to orient the shoe to where it's going to be relative to the body. If the shoe is already in the right place, you don't need to worry about this. If not, keep all the vertices selected and use the transform tools, shown on the right, to scale and move the shoe until you have it right where you want it on the foot. You can type in values directly by clicking on any of these buttons, then right clicking on them to bring up the window for typing in values. The tools are, from left to right, move, rotate, and scale.



Your shoe should now be on one of the feet. It doesn't matter if it is the right foot or the left foot. You can apply the texture at any time. If you are using a DDS texture, you will need to download the Max DDS plugin from nVidia's website.

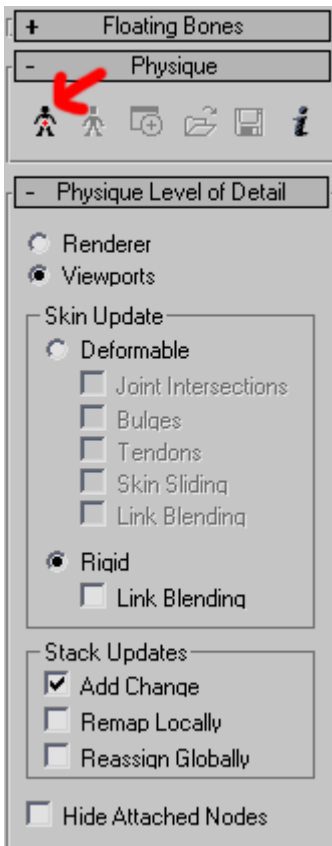
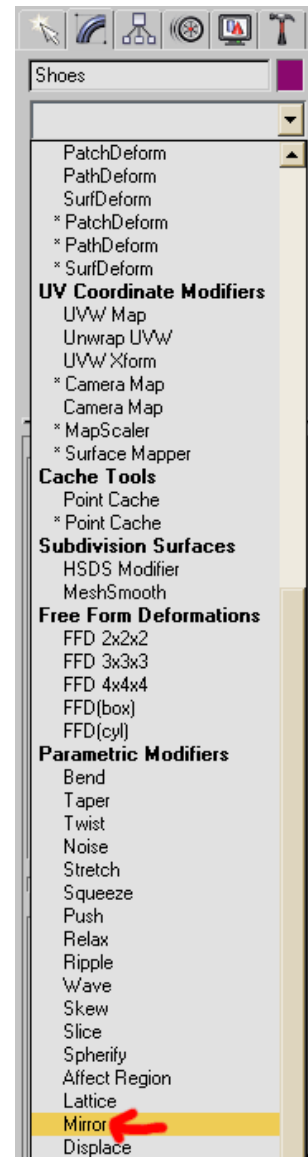


Now it's time to put the shoe on the other foot. With the shoe selected, click on the modifiers tab and find "Mirror" under the pull-down menu. Make sure that under "Mirror Parameters" you check "X-axis" and "Copy" like so:




Now you have a shoe on each foot. Now, right click on one of the shoes and choose "Convert to => Editable Mesh" from the pop-up menu.

The next step is to apply Physique to the shoes. Under the modifier pull-down menu, you should also be able to find Physique. It should be near the bottom. If you can't find Physique, you probably don't have Character Studio installed.

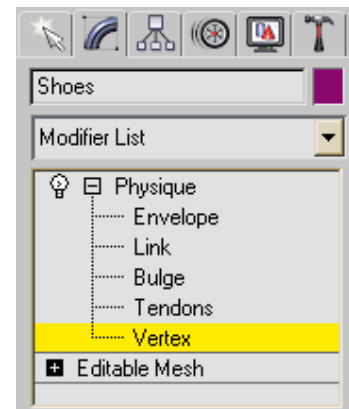


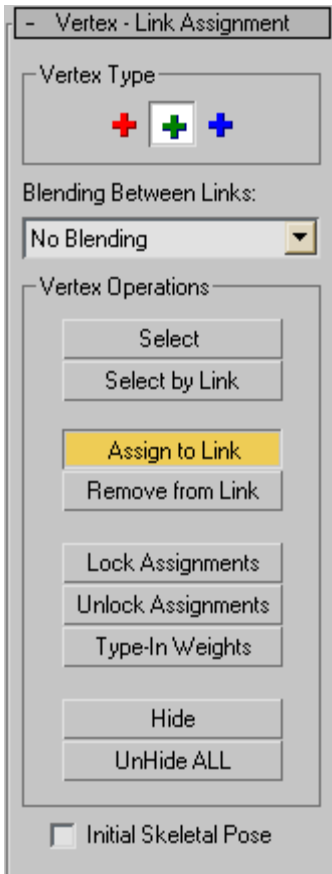
Once you assign Physique, set the options to look like the ones to the left, and then click on the "Attach to Node" button, as indicated.

You want to attach it to the "Bip01" node. The easiest way to do this is to use the "Select by Name" button, which looks like this:  Find the "Bip01" object, and choose "Pick." When the options window pops up, make sure to select "Rigid" not "Deformable", set the blending to "No Blending" and uncheck the "Create Envelopes" box, then click "Initialize."

on the mesh.

Now, open up the Physique modifier and click on the "Vertex" submodifier. You should now see little white + signs highlighting each vertex

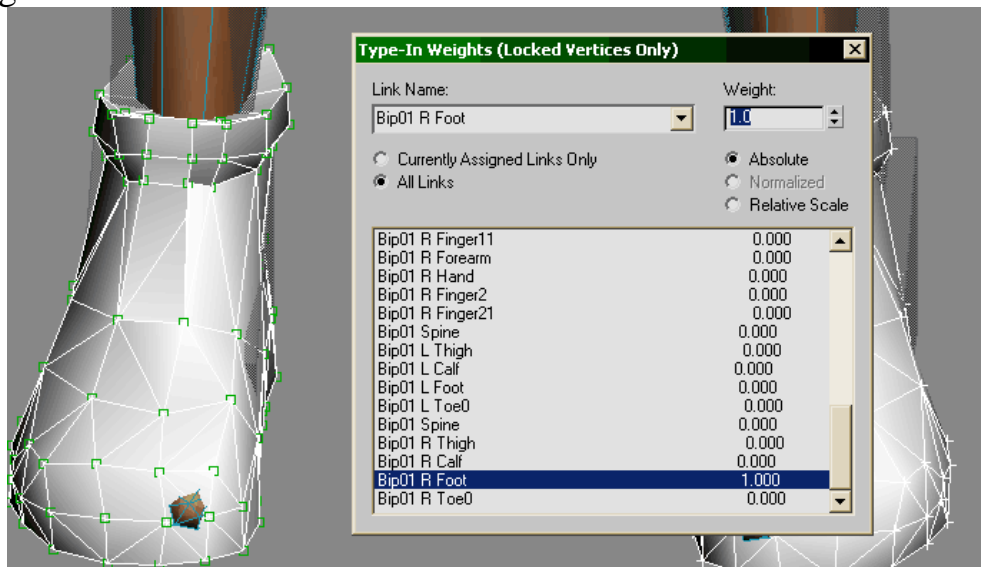




Now, choose “Assign to Link” from the buttons below the modifier window. Click the green + button. Make sure that “No Blending” is selected and click the “Select” button again. See the picture on the right. This modifier tends to reset itself every time you save and load, so make sure to check it.

Now select all the vertices on the right foot. They should all be blue. Click the “Lock Assignments” button, then the “Type-In Weights” button from below the modifier window. Another window will now pop up, similar to the one below. Select “All Links” so that all of your link choices are visible. Now scroll down the list until you see “Bip01 R Foot.” This is the right foot bone, which is what you want the right foot of your model to move with. Click on it, then in the “Weight” window, type “1”. The vertices on your mesh should now turn light green. If any of them are red, you did something wrong. This goes for any other clothing items too.


Do the same thing for the left foot, but obviously don’t use the right foot bone, use the “Bip01 L Foot” bone. You can assign vertices to more than one bone. To do this, you type in numbers for each of the various bones corresponding to how much you want the vertices you have selected to move with each bone. If a vertex is weighted to more than one bone it will turn dark green.




Now, when you are done, change the name of the mesh under the modifier tab to “Right Foot.” This is the name you want to give all shoes. Now click on the hierarchy tab. Both the hierarchy tab and



the place where you type in the name of your mesh are shown in the picture to the right. Under the hierarchy tab, click the “Affect Pivot Only” button. This should show you the precise location of your pivot. Make sure it is at the point 0, 0, 0 and that the red arrow is pointing left, the green arrow is pointing backwards, and the blue arrow is pointing up, relative to the person.

Now delete all the meshes from the original body. Those were just for reference. You should be left with just a pair of shoes and a skeleton. Now, with your shoes selected, click the link button. It looks like this:  Now

click the “Select by Name” button again. It looks like this:  Choose “Bip01” from the list that pops up and click “Link” on the bottom.

Now go to “File -> Export” and select “TES Exporter” as the file type. When you export, make sure to check the “Export Vertex Weights” box and uncheck the “Exclude Duplicate Z-Buffers” box. Save it as whatever you like. You can use NifTexture or some comparable utility to change the name of the texture later.

When you create your object in the construction set, make sure to make it a “Shoes” object, not “Pants,” “Shirt” or anything else. Also make sure that you only assign this mesh to the “**Right Foot**” slot. **DO NOT** assign **ANYTHING** to the left foot slot. If you are familiar with the basics of making items in the construction set, this tutorial should have everything you need to know. If not, I recommend downloading our tutorial videos at:

- <http://tfo.rh.rit.edu/p/gladius.avi>
- http://tfo.rh.rit.edu/p/uv_high.avi
- http://tfo.rh.rit.edu/p/tex_high.avi
- http://tfo.rh.rit.edu/p/exporting_1high.avi
- http://tfo.rh.rit.edu/p/exporting2_high.avi

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