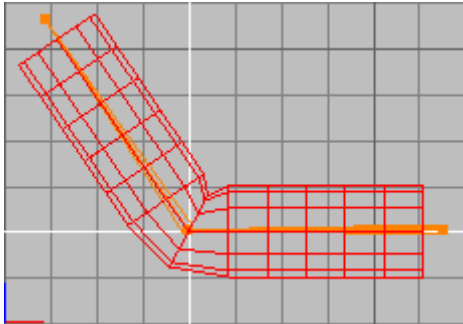


The Process of Creating Skin

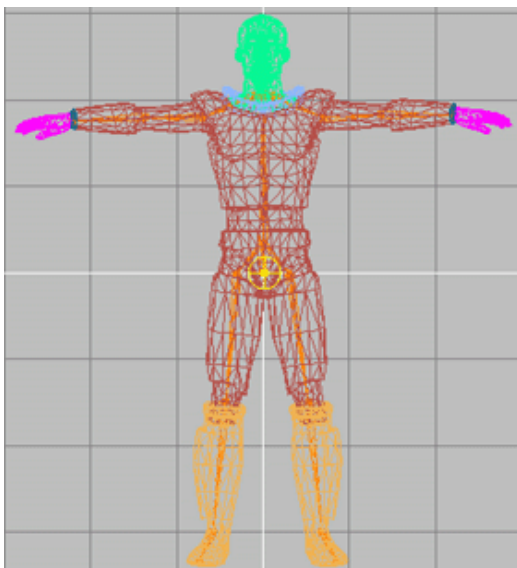
Prometheus explains the process of creating a skin for your model

GENERAL



Skins are solid meshes that have other objects -usually bones- controlling their vertices. Each vertex is 'linked' to a bone and has a 'weight' value which is the amount of influence. Values are between 0-1. They can be used for any model but in this tutorial we'll focus on 3D games characters. There are two kinds of models: segmented and solid meshes. The segmented characters consist of many objects that define different parts of the character's body(head,arms,legs etc.) and are joined together via a hierarchy, they render faster but there are drawbacks. The seams always get to show themselves no matter how hard someone tries to hide them. Solid mesh characters on the other hand need more calculations but the joints bend smoothly and realistically. There are some issues you should pay attention to when designing the model and placing the bones. Put extra detail(more triangles) at the areas of the model that flex, such as knees, elbows so that deformation is smooth. Also be careful when placing the bones. Always keep the detail and skeleton's number of bones to the range of movements your character performs. The skeleton can be build with any object but using bones is widely used. Bones are simple objects that don't contain any geometry but pos,rot,scale information and are linked together via a hierarchy. A simple human skeleton should have: head, shoulders, upper arms, forearms, hands, spine(2-3 bones should do), pelvis, thighs, calves, feet ones. Extra bones can be added -weapons, maybe-. Give the bones descriptive names: Bone_Head, Bone_LeftForearm etc. A good idea is to use the model as a guide to build the skeleton. You may also have some already made skeletons that only need fitting.

SKINS-SKELETONS IN LIGHTRAY3D



Let's see now how to deal with skins,skeletons in LR3D.First, here are some rules that will help you control skins easier:

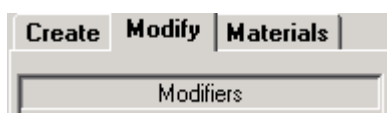
A)Make sure that the model is ready to be transformed into a skin mesh.This means geometry needs no more changes,materials are all set,uv mapping is correct.You can always convert skins back to meshes for further modifications -versions up to 1.3.2 don't support verts,faces,edges editing for skins- and then replace skin's geometry.

B)Use frame 0 for posing the model and skeleton.This will be the pose frame -idle- that you should never animate.It will be used each time you'll need to rearrange,change the model or the skeleton.If you already have a skeleton animated(including frame 0) you can set the pose(ver.>=1.3.2 only) with 'Set Pose At Current Time' button.This will have the verts recalculated relative to the parent bones that control them.

C)Put the bones correctly so that the skin joints deform the mesh smoothly.Expiriment with weights and rotate/move bones to see the resulting deformation before continuing with the other bones.

Step 1

Converting Mesh to Skin



Having the model ready:Select mesh.Go to control panel's Modify tab dialog.



A 'EditMesh' dialog will appear or be there.Click on it when the cursor turns into a wide open hand and drag up-down to see all the controls.At the bottom there's a button named 'Convert To Skin'.Press it.You'll be asked if you want the mesh deleted.It's a good idea to keep the mesh as a copy, so you can always replace a skin's geometry if it needs modifying.If you delete mesh you can always re-convert back to mesh via the 'EditSkin' dialog's 'Convert To Mesh' button.Now you have a skin.

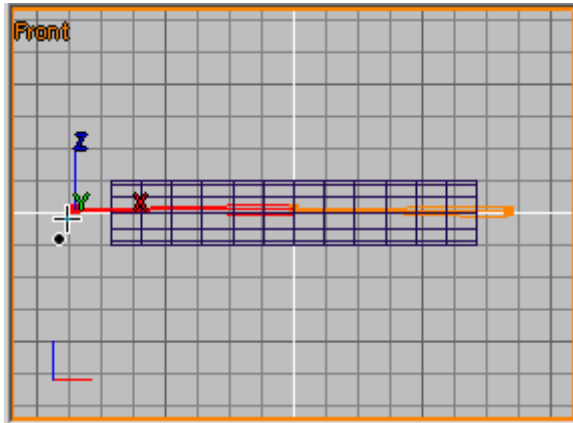
Step 2

Creating the skeleton

[img:6f74895e

85]<http://www.sxcreations.com/Tutorial/Images/skin5.gif>[img:6f74895e85]

Go to control panel's Create tab dialog. Select 'Bones' category from the drop-down list. In the list below select 'Bone'. Press the 'Create' button to get in 'create mode'.



Start clicking in active view to create bones. When done just press again the 'Create' button or click a toolbar button or change the tab dialog and you'll get out of 'create mode'. The bones you've created will be linked. If you need unlinked ones, just press 'Create' for each or unlink them.

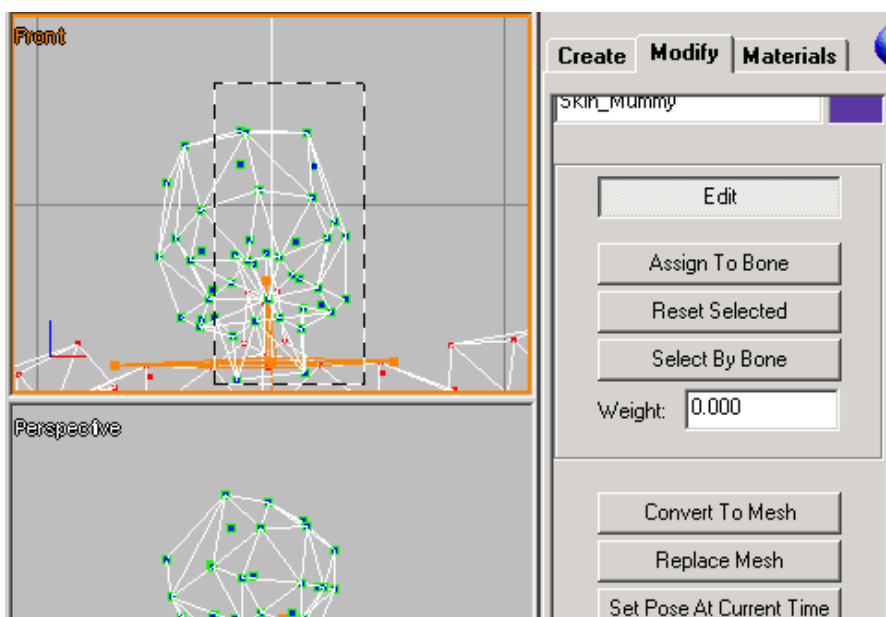
Step 3

Fitting the skeleton

Having a skeleton ready: Move, Rotate to fit the bones to the model joints (elbows, head, torso etc.). NOTE: Try not to SCALE (use Move tool along bone axis) and use Rotate instead of Position where possible.

Step 4

Assigning verts to bones



Having the skin selected: Go to control panel's Modify tab dialog. A 'EditSkin' dialog appears or already there. Press the 'Edit' button. Start top-bottom or bottom-top. Select head's vertices and now press 'Assign To Bone' button. Now you can either click in active view and select bone or do it via the scene-list dialog (see Menu->Tools/Scene List OR toolbar's Scene List button). Now press again the 'Assign To Bone' button to return in 'edit mode' and set the weights. If you want different weights -once a bone assigned- you can select only the vertices you need and change weight. If you want to see which verts are assigned to a bone just press 'Select By Bone' button. The 'Reset Selected' button will have the selected vertices reset, no bone and zero weighted. NOTE: The weight field will be blank if selected verts have different weight values. Also the colors will help you with the weight value: Red=1 - Blue=0 - inbetween values are interpolated. Blue verts are also called 'rigid' ones. Do the same with other parts of the model. You can always check if everything's ok before continuing by selecting the bone and rotate/move to see how the verts are deformed. If too 'wide' rotations don't seem right have in mind that you should only be interested in the motion your character will perform. Will he run, bend over, jump etc.? If you're not satisfied go back in 'EditSkin' change weight values OR rearrange bones but first you'll have to unlink all verts that are controlled by this bone. Weight values will be lost though! A workaround is to set all weight values to 1, make sure the bone is positioned correctly and then set the weights.

LAST NOTE: Try to always work at frame 0 when editing skins.

Edit Skin(v1.3.4)

CreateModifyMaterials

Skin2

Edit

DeleteInvalidate

AttachDetach

Set Weight

Assign To Bone

Add Bone

Remove Bone

Select By Bone

Reset Selected

Normalize Weights

Bind Skin

Convert To Mesh

Replace Mesh

Set Pose At Current Time

Update Skin Mesh

EditSkin

Must have Edit pressed in order to edit vertices and use some of the operations below.

Delete: Delete selected vertices.

Invalidate: Invalidates unused tex verts, degenerated faces and clears 'em.

Attach: Mesh or another skin.

Detach: Works for selected vertices.

Bones List: Bones used for selected vertex/vertices(multi-weighted).

Weight value: Between 0.0-1.0

Assign selected verts to a bone. Existing bones will be replaced.

Add bones(multi-weighted verts). Must manually set weight value.

Remove selected bone(s) (selected in Bones List above).

Pick a bone(from scene list) and the vertices it controls(if any) will be selected.

Resets selected vertices' weights, removes bones.

Normalize: All weight values sum for each vertex must not exceed 1.
i.e bone1(1.0) + bone2(1.0)=2.0 -> bone1(0.5) + bone2(0.5)=1.0

Tries to auto-assign vertices to nearest bones. Results may vary depending on the model's initial pose and bones placement.

Convert into a mesh object.

Replace Mesh:
If this skin object was converted into a mesh for modifying you can replace geometry(verts, faces, tex verts) provided that num of verts and faces remain the same.

Set Pose: Updates skin vertices xyz data.

Update Skin Mesh: Updates vertices offsets relative to bones.

Creating a skin object out of a mesh(converting)

NOTE:

Before converting mesh models into skins make sure the models need no more modifications else will be hard to edit 'em, especially if vertices/faces are deleted.

For each mesh:

Select mesh and go to Modify/EditMesh.Scroll down and find 'Convert To Skin' button.Press it.

A dialog window will ask if you want old mesh object deleted.If you dont need it press Yes.

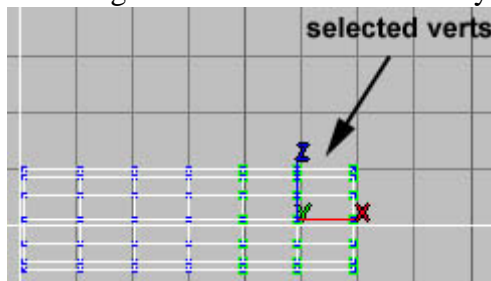


Assigning vertices to bones:

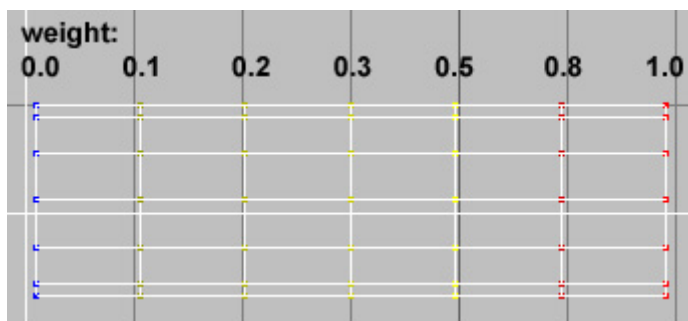
Select skin and go to Modify/EditSkin.Press the 'Edit' button.Select vertices, and press 'Assign To Bone'.

Now select a bone by directly clicking on it in a viewport OR use the SceneList.

The weight value will be set to 1.0 by default(existing bones,if any, will be removed).



Vertex weight colors:



Adding Bones(multi-weights)

Same as assigning but use 'Add Bone' button and set weight value manually.

Weights sum must not exceed 1.0. Use 'Normalize Weights'.

Editing Skin

The only way is to convert it back into a mesh.But weight data will be lost.

That's why you must have the model ready before making it a skin.

If you dont mess around with vertices/faces (add or delete 'em) you can use 'Replace Mesh' operation.

Prometheus