



# Manuel

## **Thomas4d Rigging tools Version 2**

*Helps creation Solid Character rigs in Minutes by Editing the Skelegon provided in the content and make weights Maps as per name conversions then save in modeler and once loaded into Lightwave Layout,*

*The Scripts will create a professional Character Rigs in Seconds.*

*I hope you enjoy this release and if you would like to see any improvements  
Email me Peter Thomas at [t4d@thomas4d.com](mailto:t4d@thomas4d.com)  
happy to answer any Questions and Add features to the next release.*

## **Changes in Version 2**

- ◆ *New skelegon layout works better with IKBooster.*
- ◆ *Less weight maps Faster weight map creation.*
- ◆ *Updated Control Objects rigger*
- ◆ *New Bone Control object Rig, Works better with Selection Sets & Keying.*
- ◆ *Completely updated Quad Rigger, Bone Controls, Better joint controls.*
- ◆ *Rotation Limits Options on all Rigs.*
- ◆ *Control rig and bone rig are interchangeable*
- ◆ *Advanced Rigger for high polygon characters*
- ◆ *New advanced Fk Arm Setup single object control*

## **Installing the Plug-ins**

Unzip the plug-ins zip file to where you load to load the content  
C: or my documents or where ever you work from

Copy the plug-ins directory to the lightwave plug-in directory  
now open lightwave and

### **in Lightwave 8**

goto the Utilites Tab at the top under plug-ins click  
add plug-ins button find where you copied the plugin to in the lightwave directory and  
select ALL the plugin the directory DONE you have install all the tools

Now add these plugin to your interface

Again in Lightwave 8 got to Edit ( Topleft) Edit menu layout  
open the plug ins Command on the left and find and select the T4D plug ins and add  
them to the interface where you want them to be

### **In Lightwave 7.5**

to the Layout button ( TopLeft ) Select plugins then Add plug ins  
find where you copied the plugin to in the lightwave directory and select ALL the plugin  
the directory DONE you have install all the tools

Now add these plugin to your interface

Again in Lightwave 7.5 got to Layout ( Topleft) then the Interface button  
then Edit Menu Layout Button  
open the plug ins Command on the left and find and select the T4D plug ins and add  
them to the interface where you want them to be

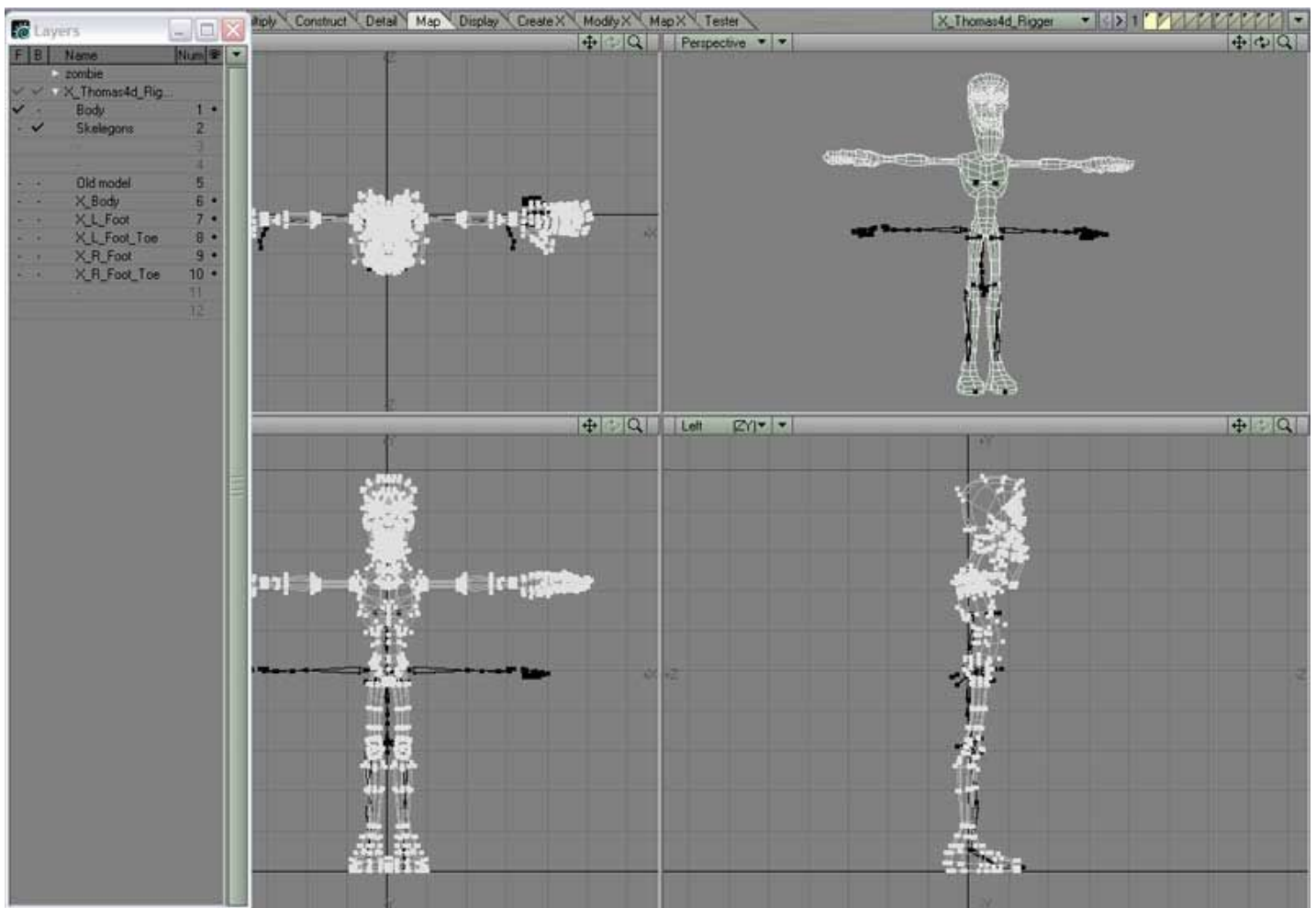
# **Guide to Creating Rig with T4d Rigging Tools**

## **Step 1**

*Load your Character into modeler and load up one of the T4D\_Rigger.lwo From the content Directory, Copy layer 1 in the T4D\_Rigger.lwo file to the 5<sup>th</sup> layer ( This will keep the naming conversions for the weight maps in the file ) and copy Your character to layer 1 in the T4D\_Rigger.lwo.*

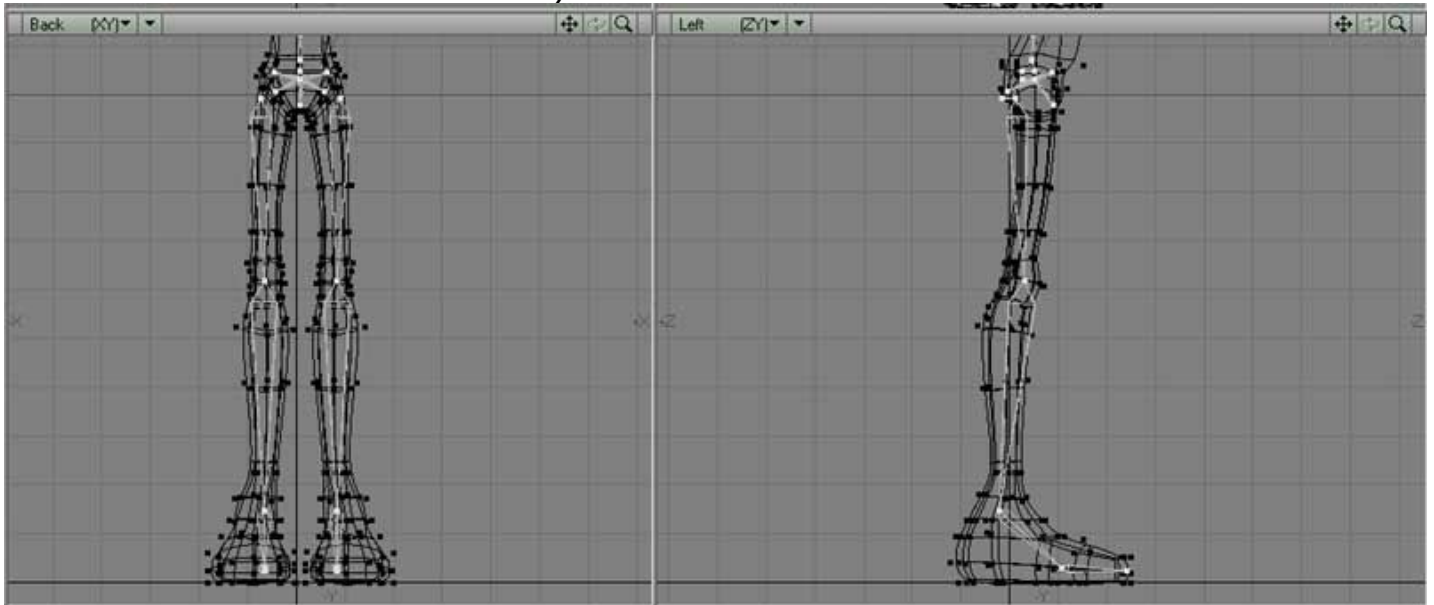
## **Step 2**

*Edit the skelegons in layer 2 to suit your character Be sure to keep the knees and elbows bent ( Helps IK ) and shoudler Bones straight in a T shape ( helps if your going to uses Rotation limits )*

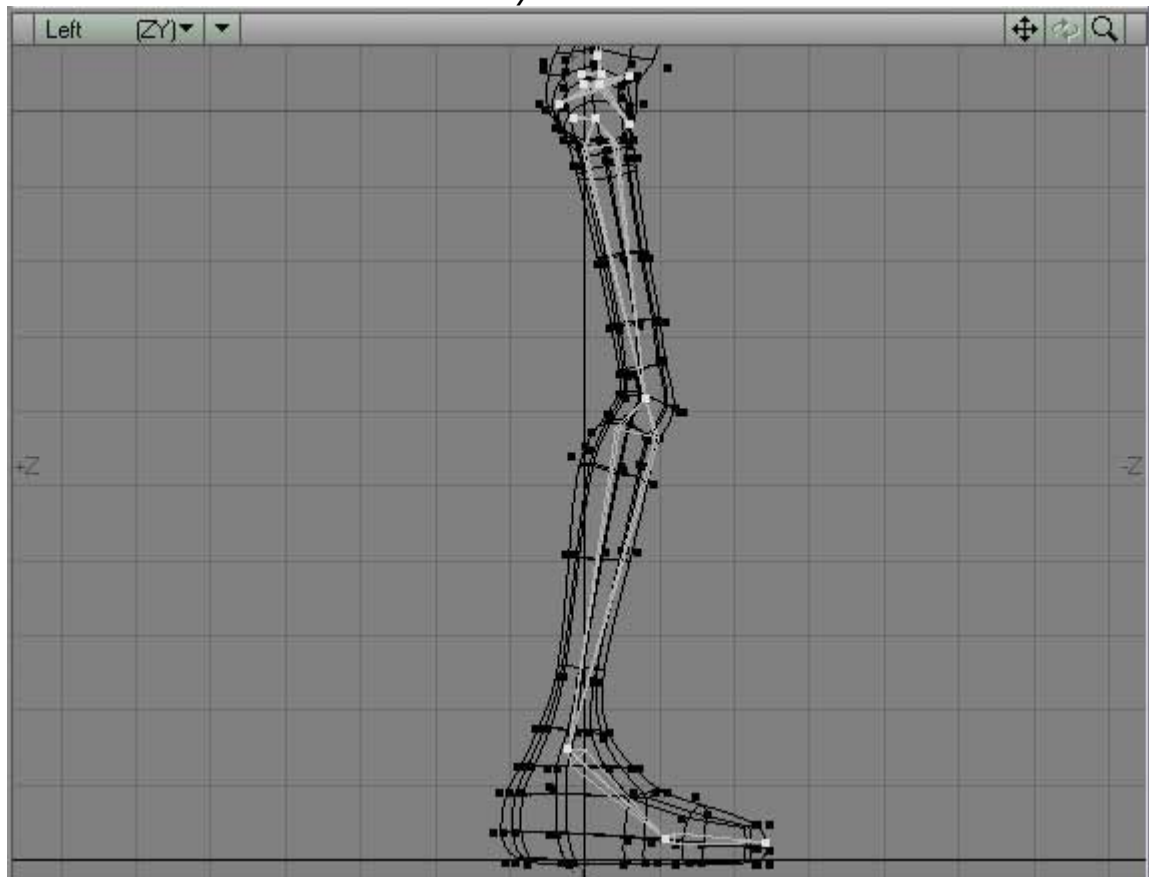


*Load your character in and rescale the Skelegons to fit your characters*

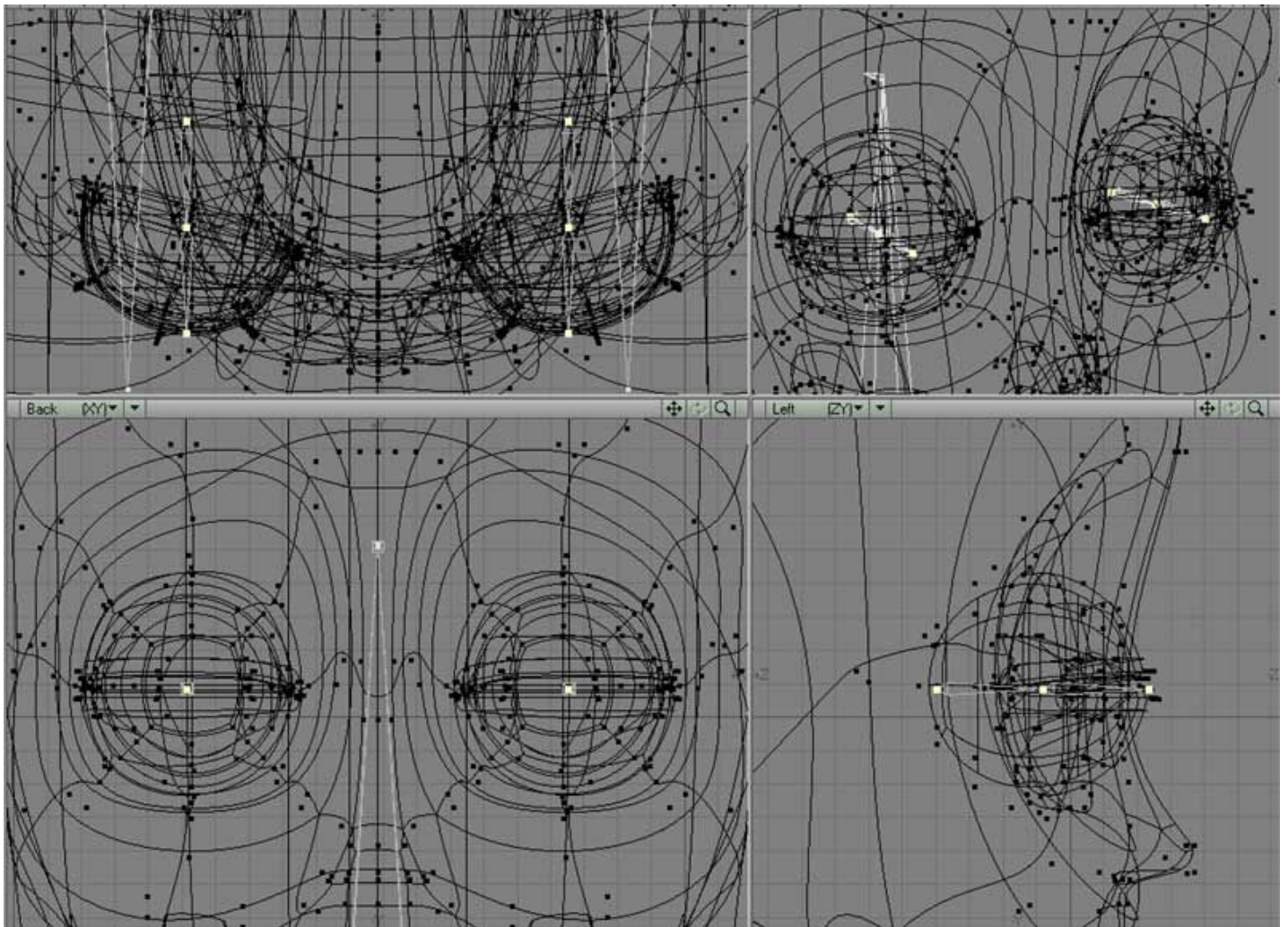
*Make sure you Bend the knee and elbows*



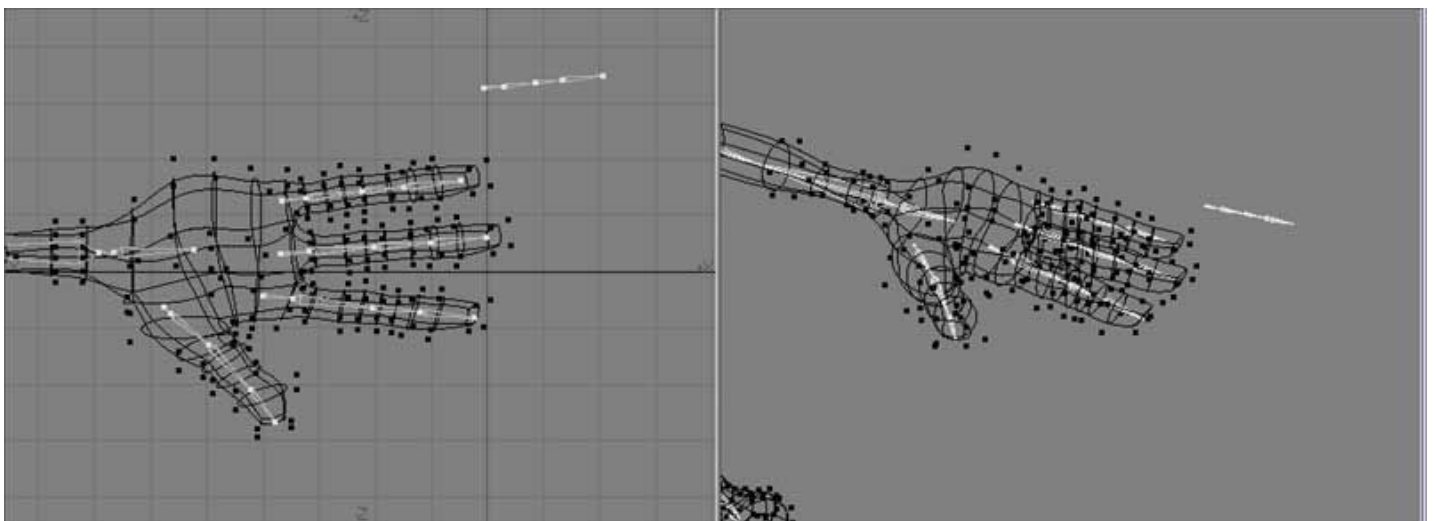
*So they look like this.*



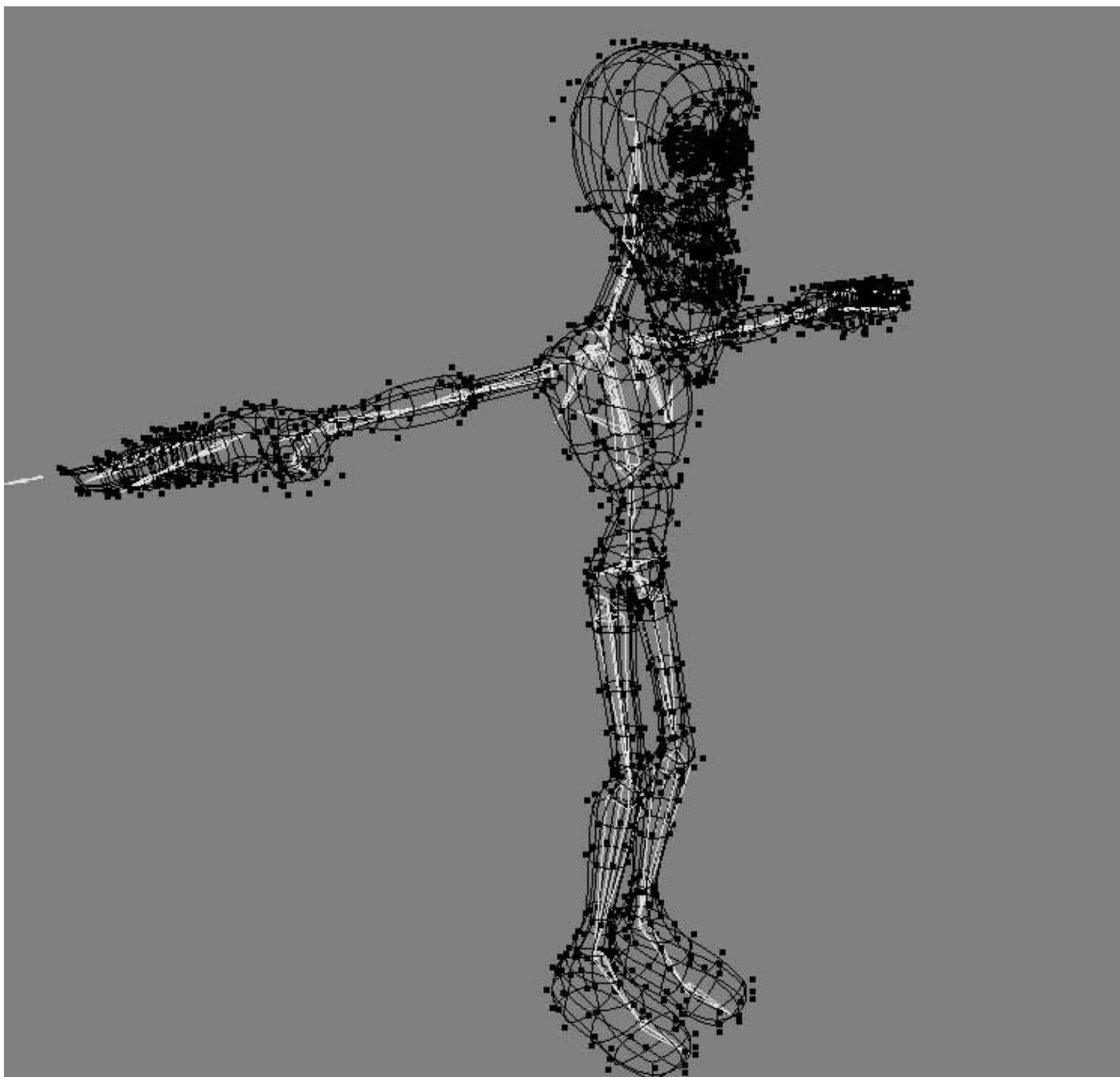
*Select the eye bone and move them into place as per picture below  
This is important due the the eye targeting rig get setup from these bones*



*If you character on has 3 finger mover the extra over out of the way and dele After you run the plugin in layout*

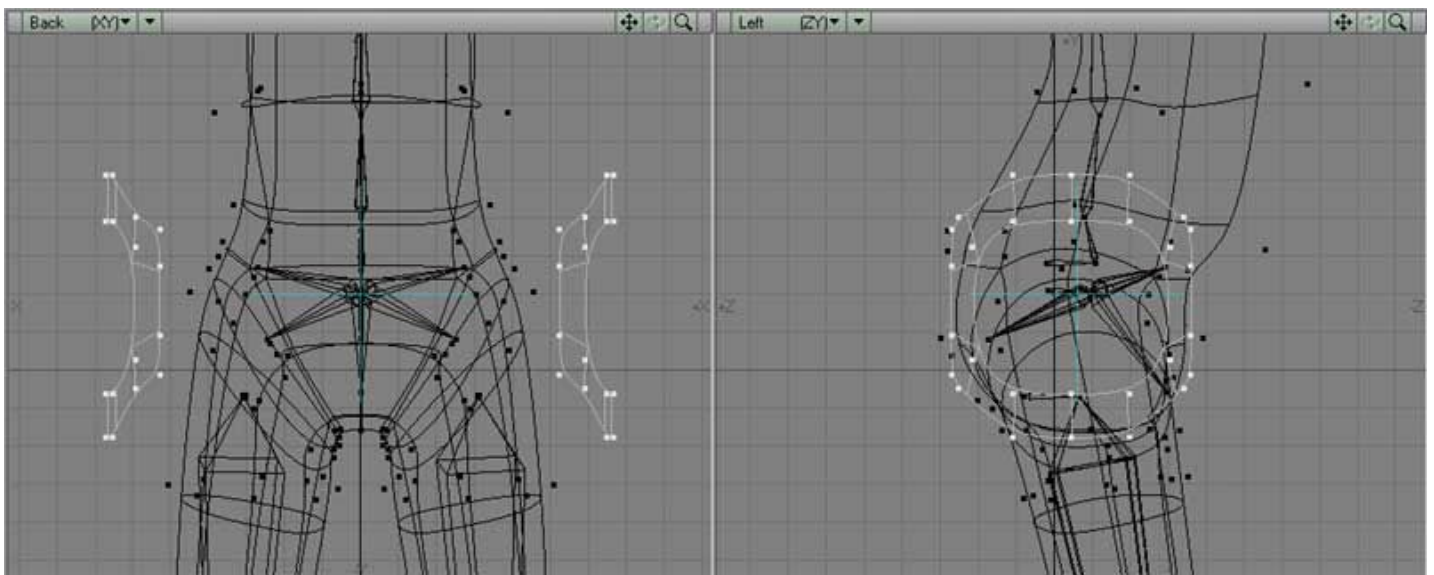


*now make sure all you bones fit in your character as per picture below  
It doesn't matter if you bone aren't perfect it's best when you run the plugin in Layout  
if you see any errors just go back to modeler edit the skelegon that are wrong, save  
and go back to layout reload and run plugins again.*

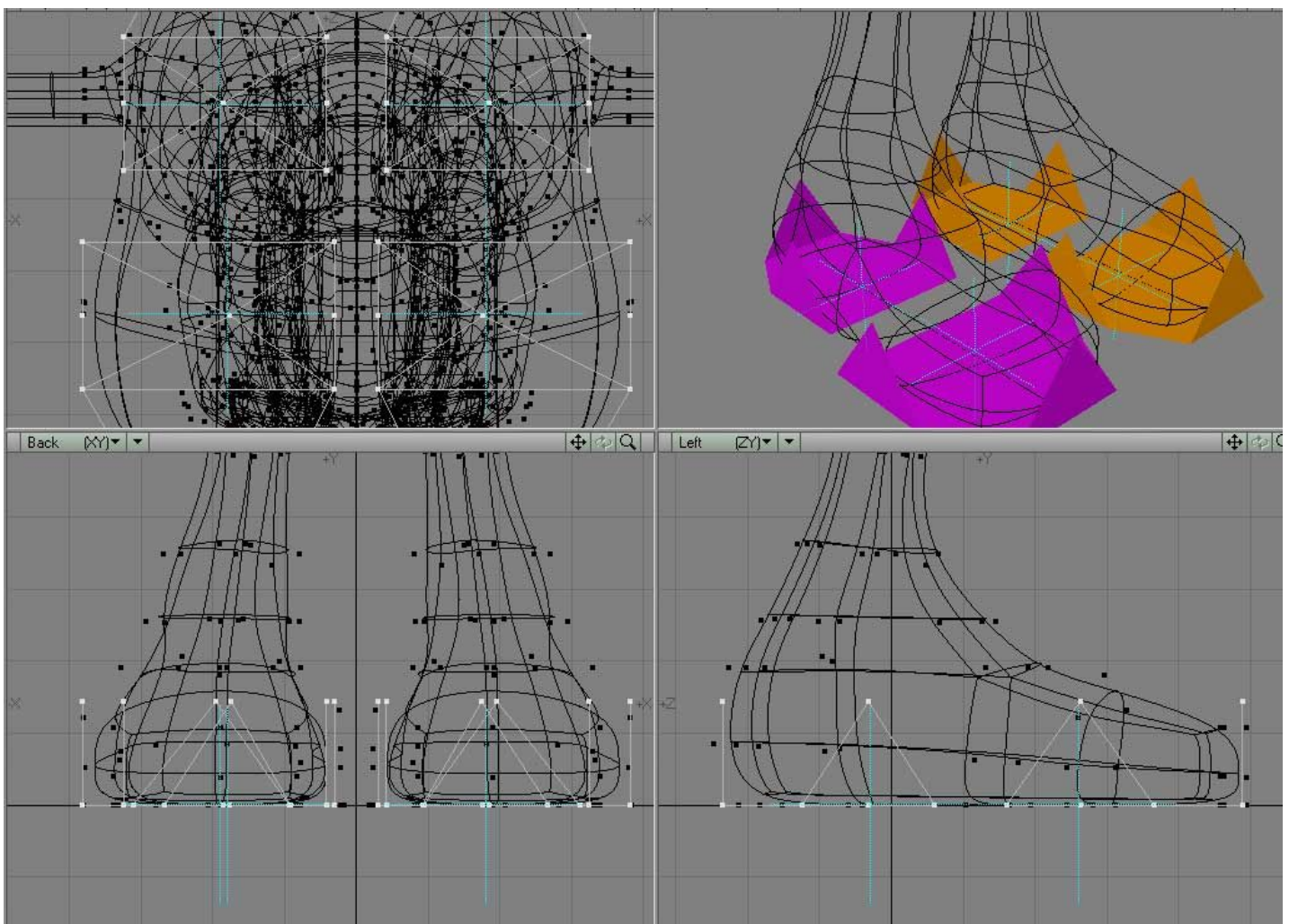


*If your using the now move the hip bone or the hip object in to place*

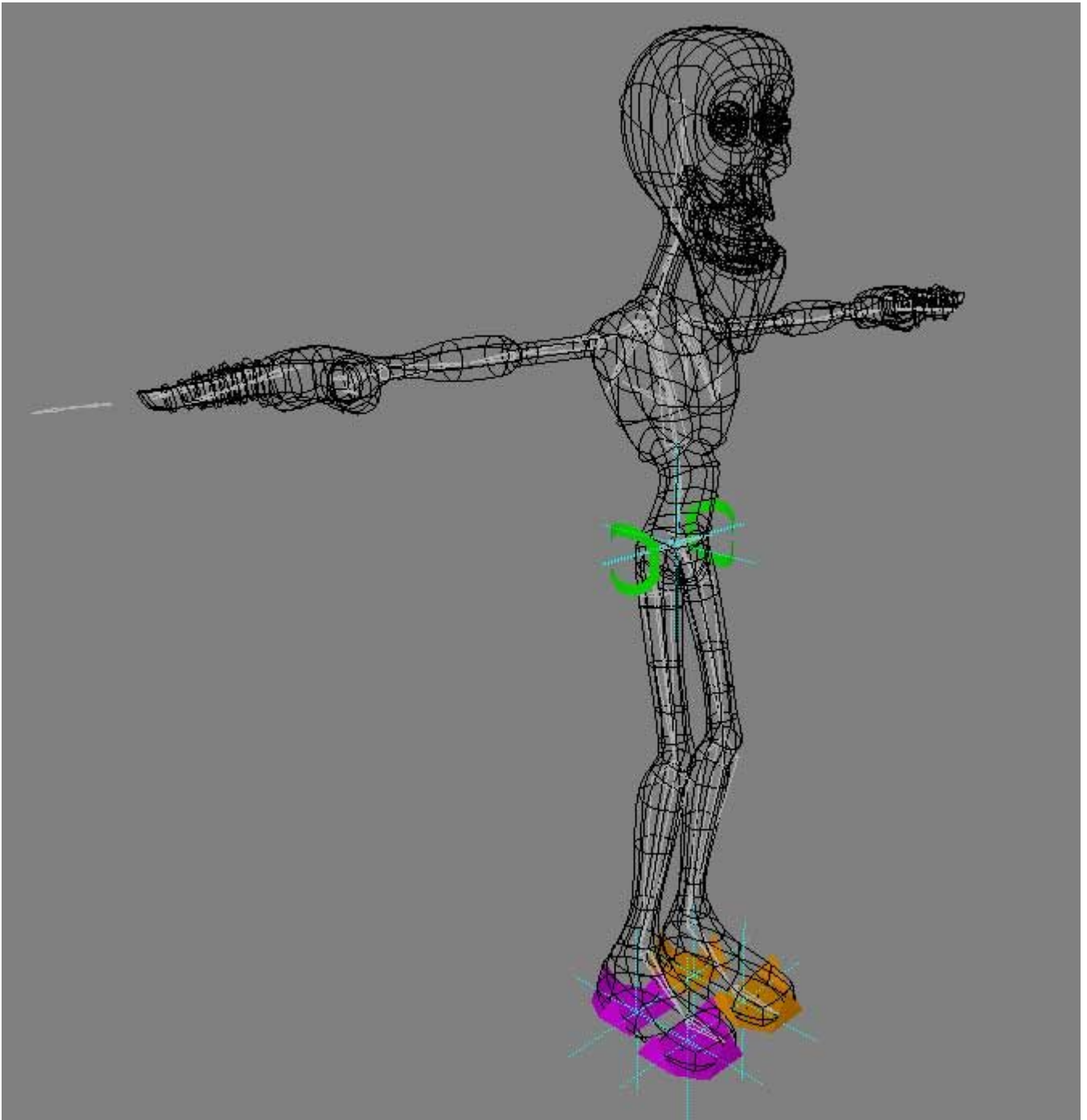
*If you using Object rigger Make sure you uses Pivot point in Modeler and place the pivot point in the center of each object*



*now do the same for the feet agin if your using the bone setup just move the feet bone into position If using the object rigger move them into place AND set the pivot points for each layer*



*That it your done save file and goto Layout =)*



### Step 3 Creating weight maps



As per List shown to the Left,  
( Names in red are only used for Facual Bone Rig )

Using these names the Plugins will assign which Weightmap each bone will effect in the Charcter Rig You can in Uses your own Weightmaps Names But you will have to assign them yourself in Layout Or if in Lightwave 8 you can Assign Weight maps to Bones in Modeler. When creating Weightmaps selections always overlaps weight maps by 1 or 2 rows of polygons, Overlapping weightmaps Gives nice Joint Deformations Also Fi's Blurweight map plugin is Great for softening weight maps falloff Get it Here at Fi's Junk Box <http://cgi.f23.aacafe.ne.jp/~fisjunk/plugin/plugin.php>

For high polygon characters ) Eg Poser Characters where the overlap can be hard overlapping is Still Very important. It's a good idea to create more then one Weightmap for each section. Then once in layout you can test the different Weight maps and even have different weight amps for each bone This is specially useful for the hip/Leg area Changing the Weightmaps & Bone Strenghtand placment of Crouch, L&R\_Bum and L&R\_Pelvis bones fixes Most Hip are problems.

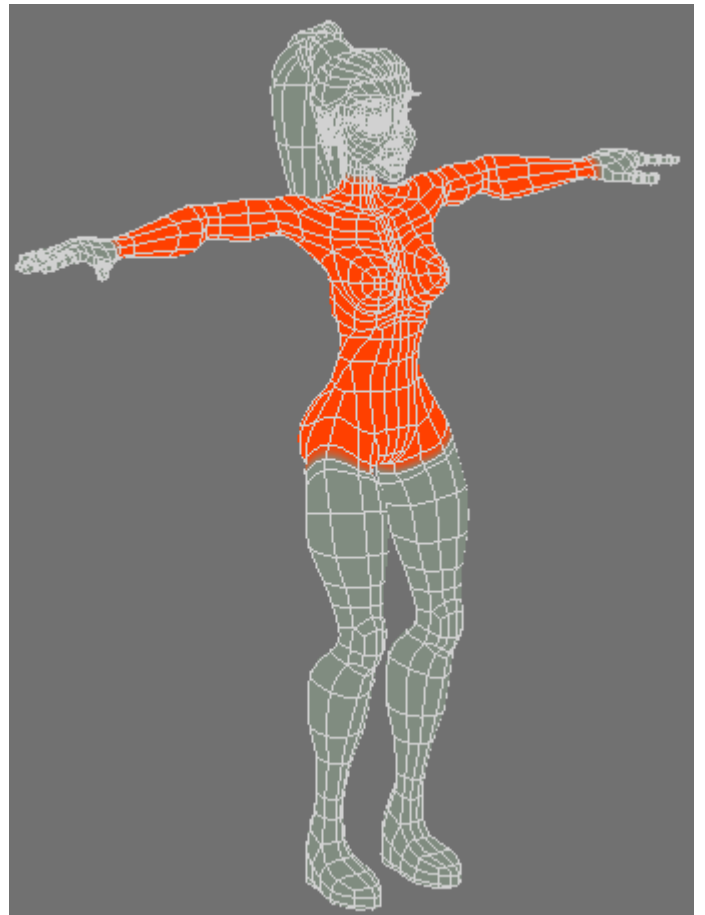
### Step 4

Copy Skelegons from layer 2 ( and layer 3 if using Facual bone rig ) to layer 1  
IF using Control Object Rig place Control objects making sure to check the Pivot Points  
If Using Bone Rig Place control bones in correct postion eg where you want to pivot to be in layout Save and Open layout run script and You have create you first T4D Rig.

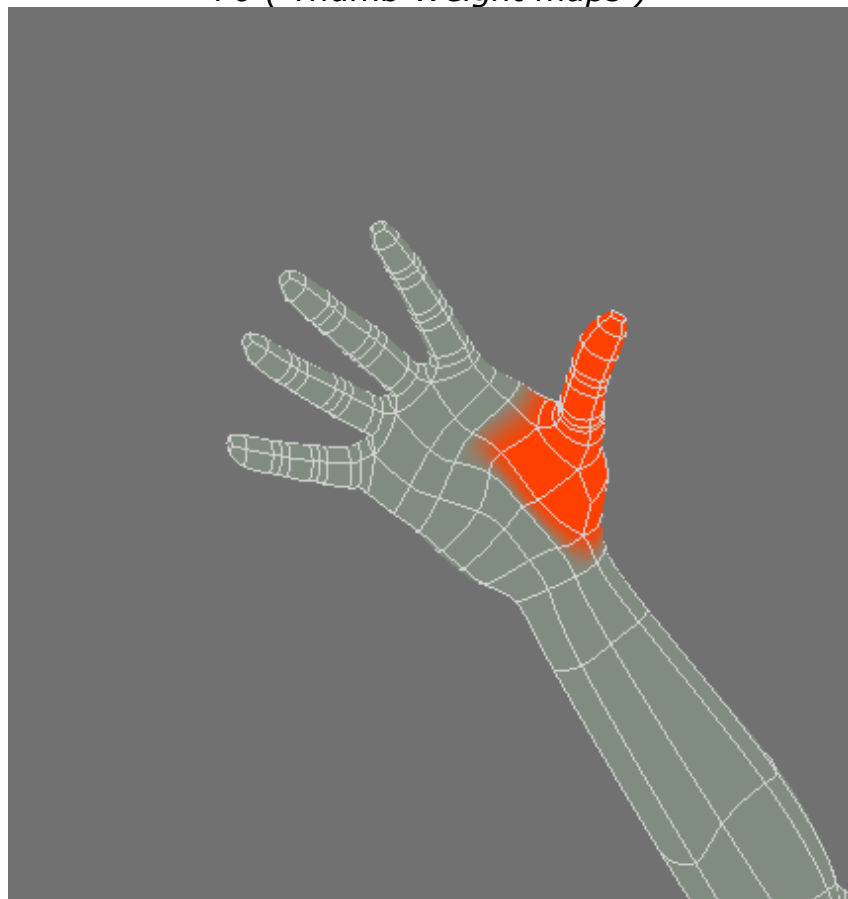
Following is a Detailed list of weight maps Used in the Thomas4d Rigging Tools  
17 weight are need for aThomas4d Rig, Facual Bone weights and Hair weight maps are not needed for a complete rig.

## Body Weightmap

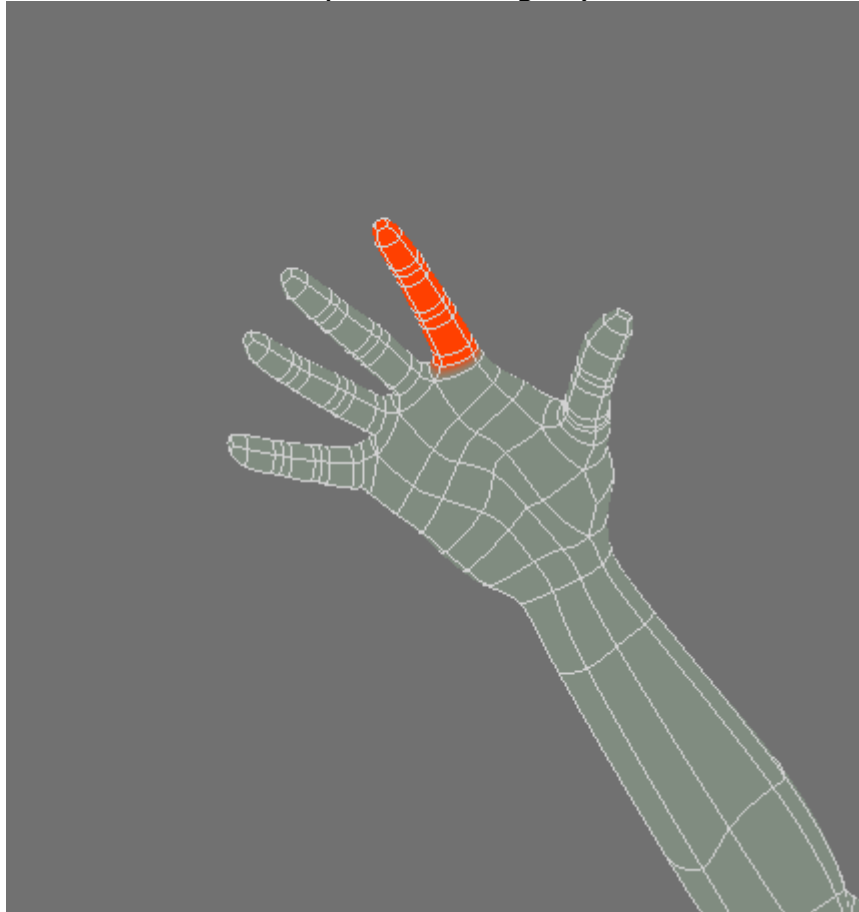
Select all hip, chest and arms polygons and create weight **w** key



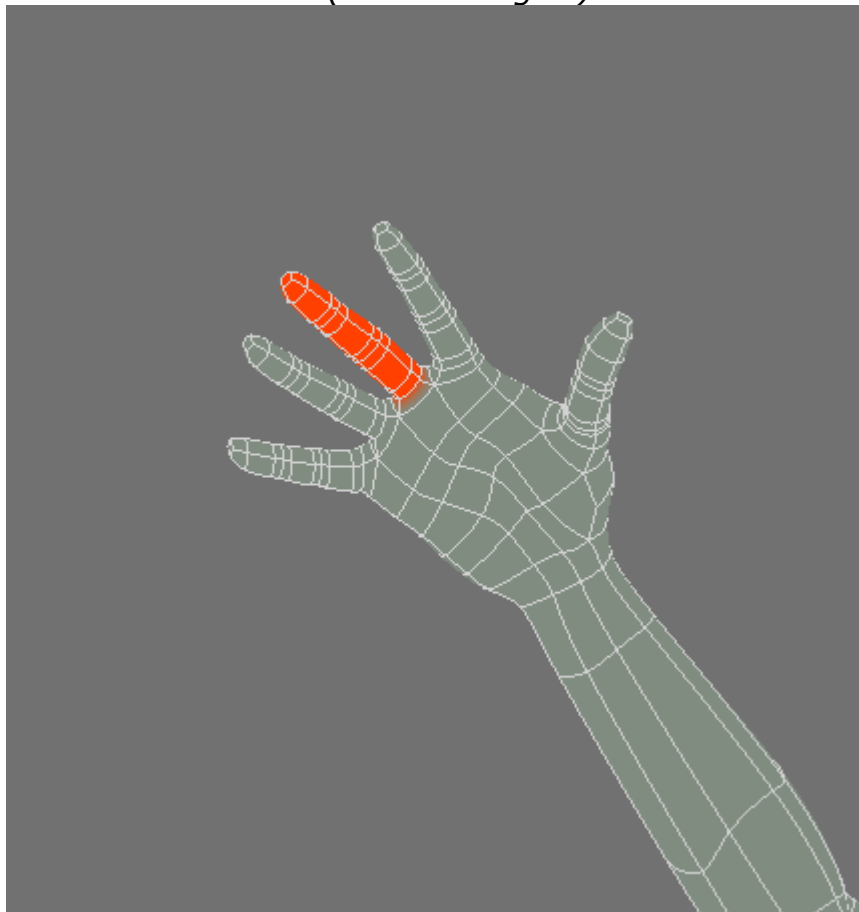
## F0 ( Thumb Weight maps )



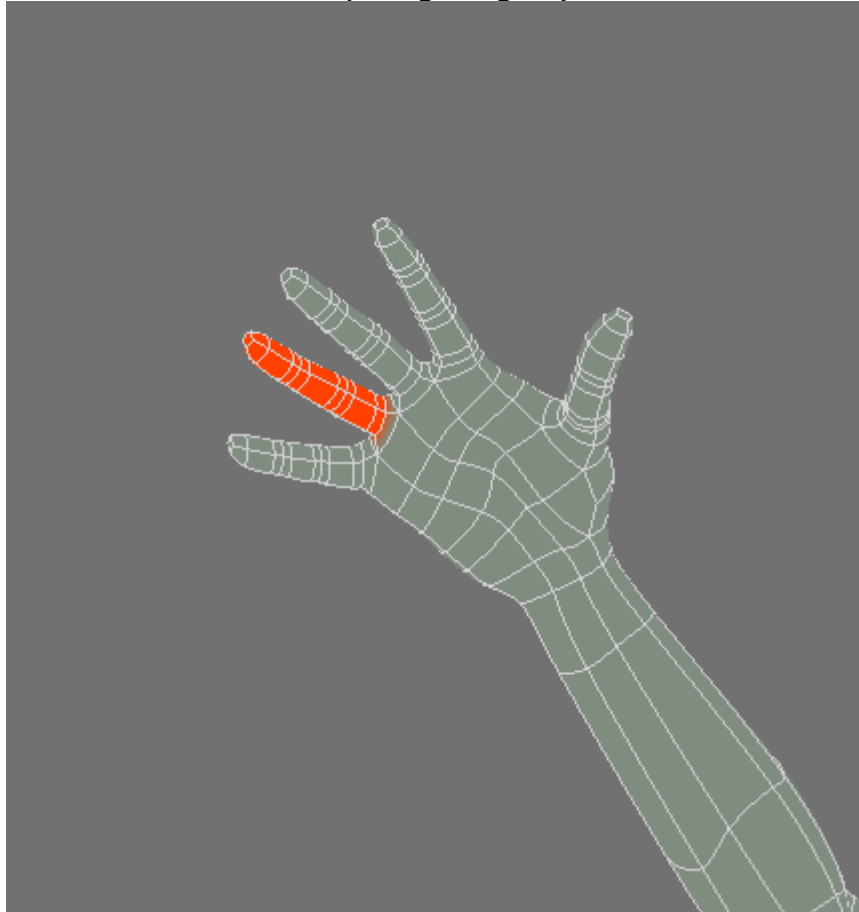
*F1 ( Pointer Finger )*



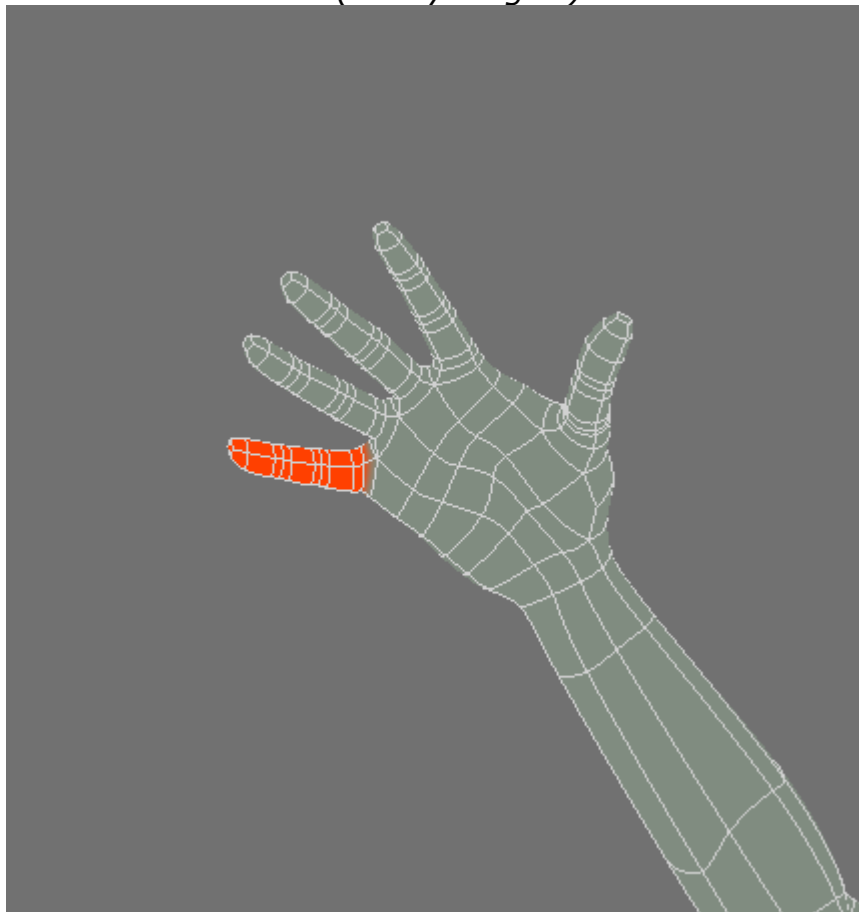
*F2 ( Middle Finger )*



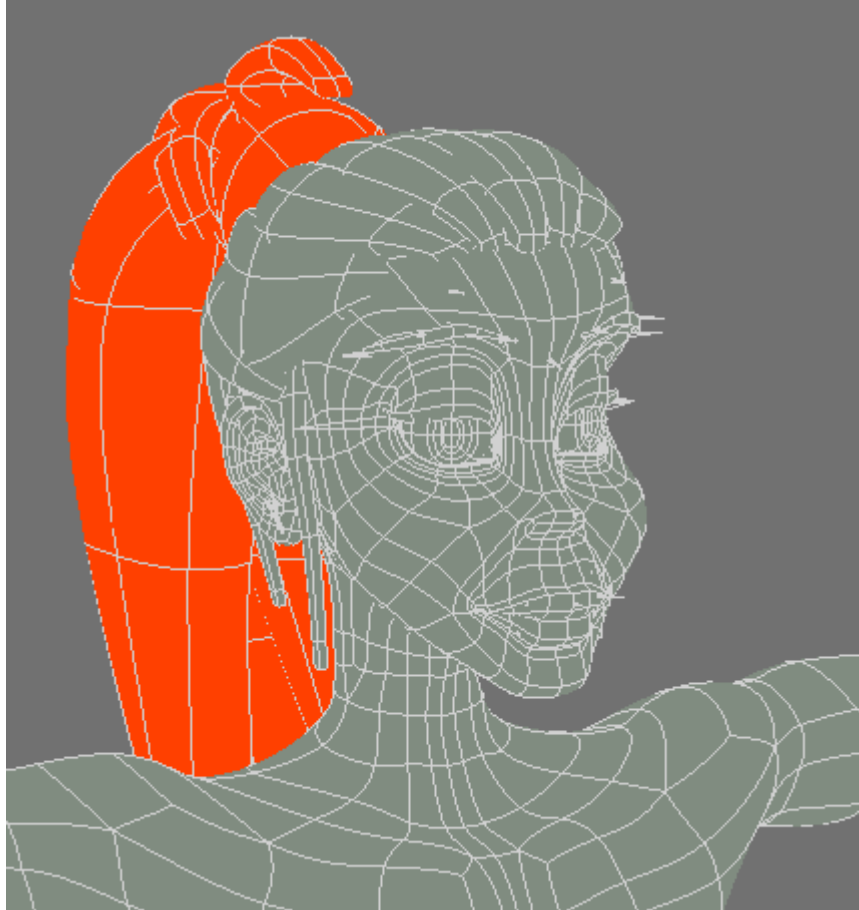
*F3 ( Ring Finger )*



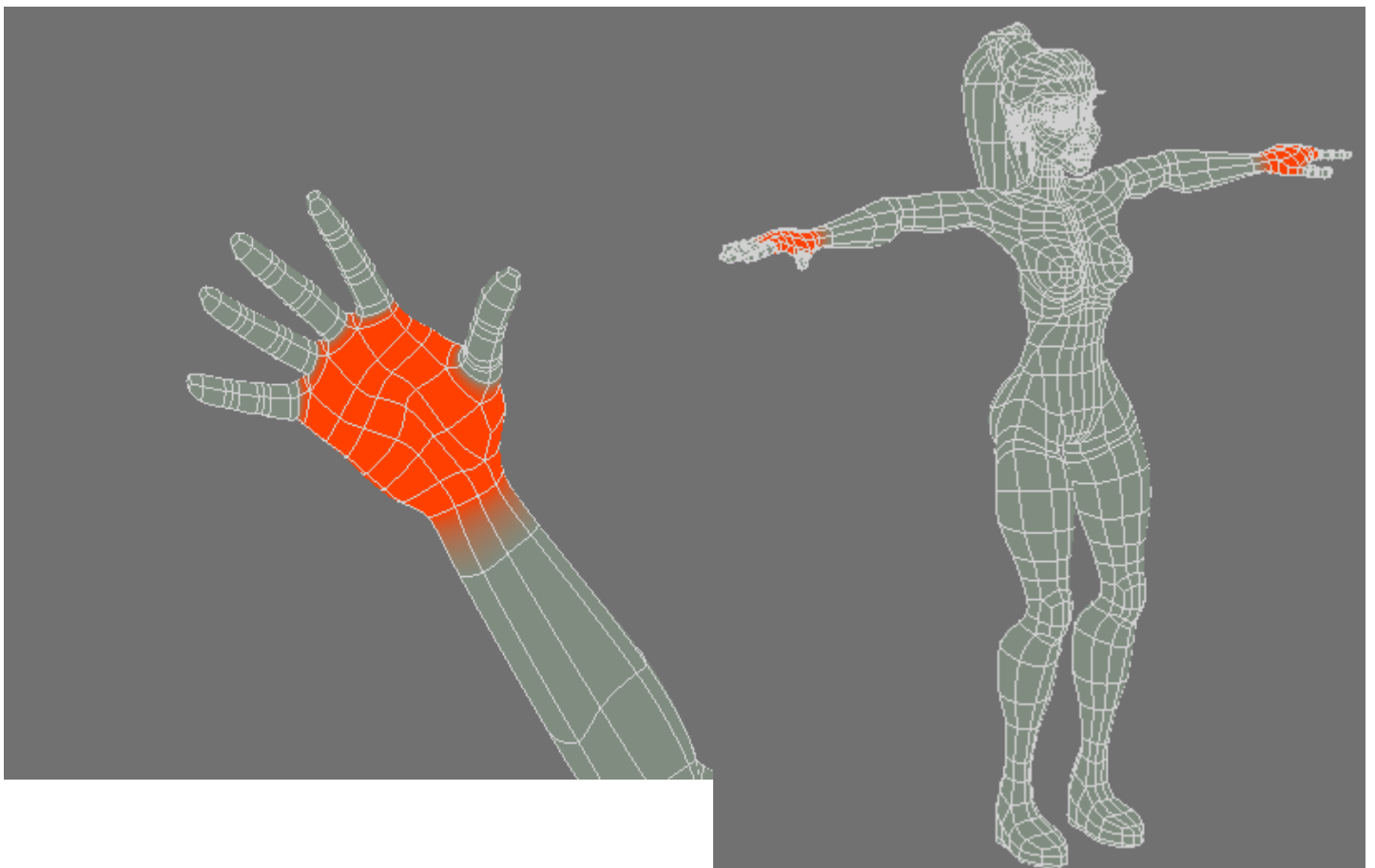
*F4 ( Pinky Finger )*



*Hair ( Or Can be used for Hat ) Tip Not need in most cases*

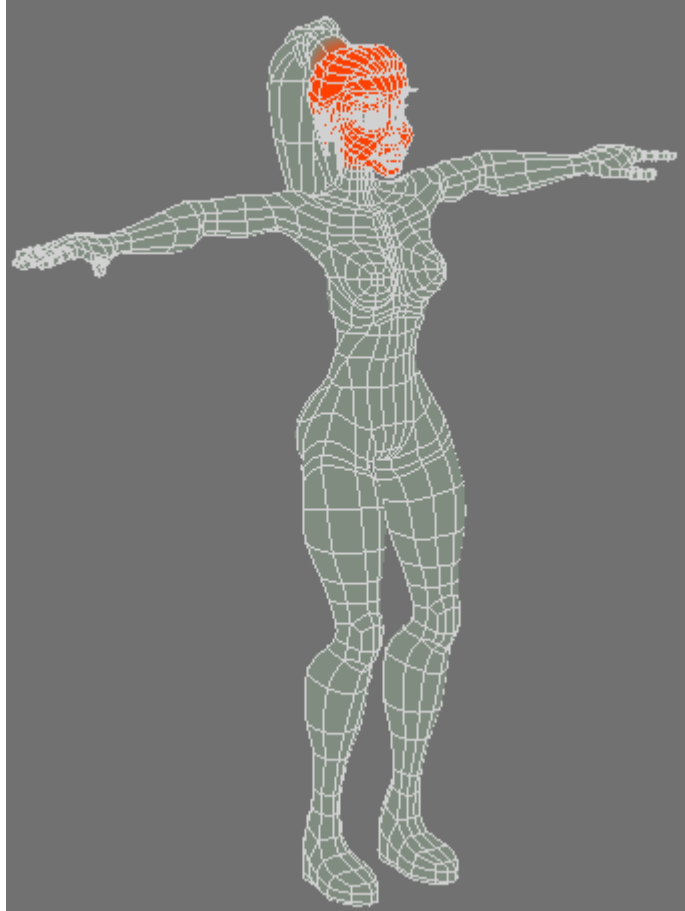


*Hands*

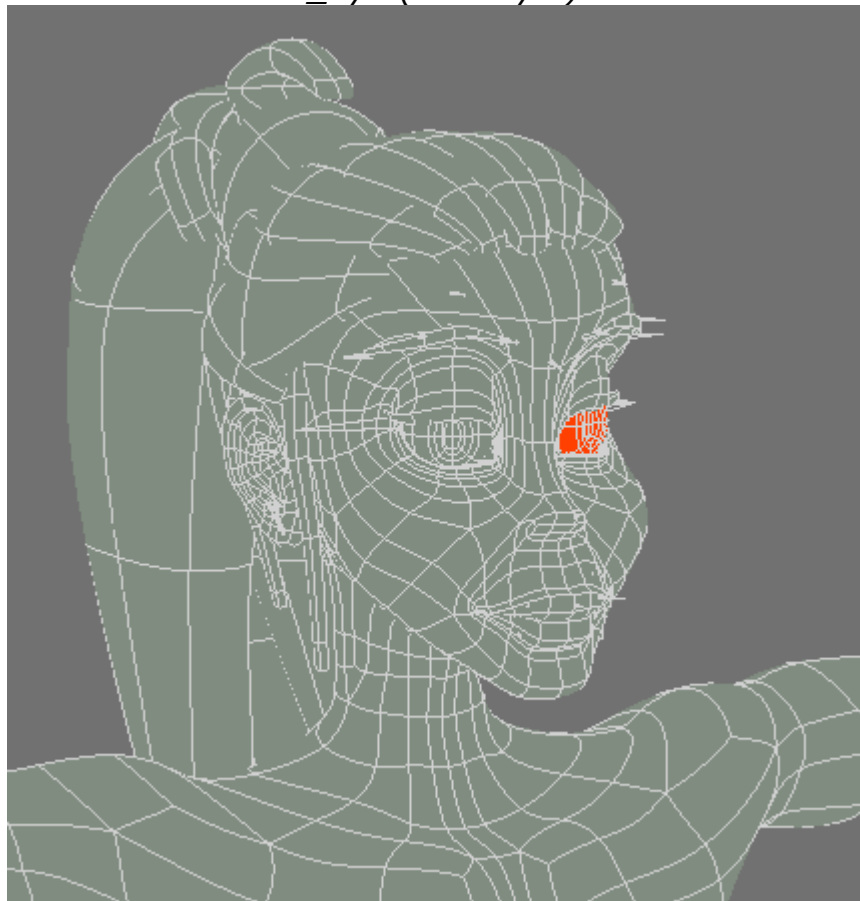


## Head

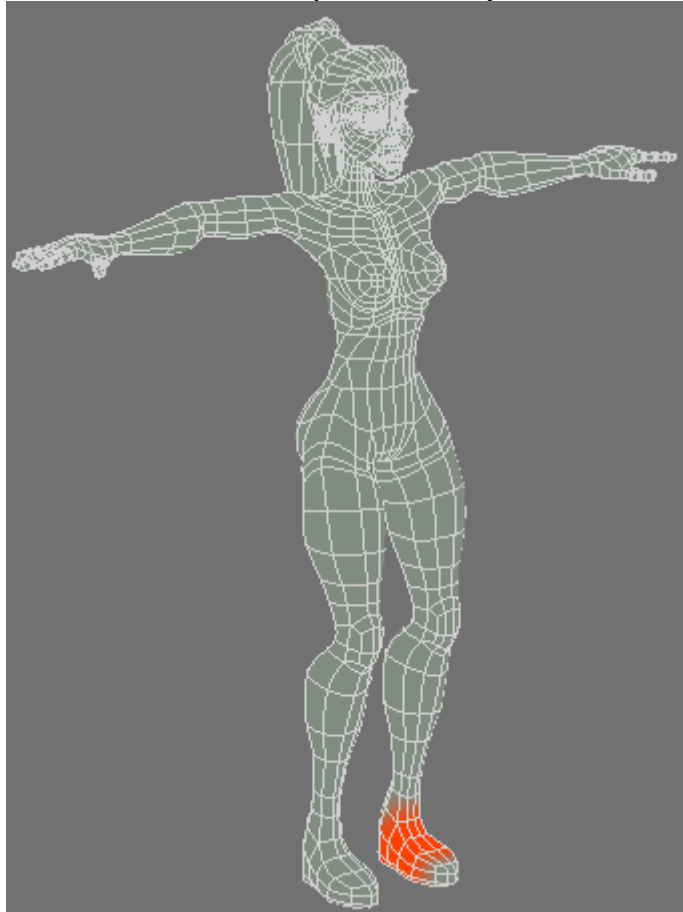
*Tip - Best copy eyes to another layer make the weight maps then copy back to layer 1*



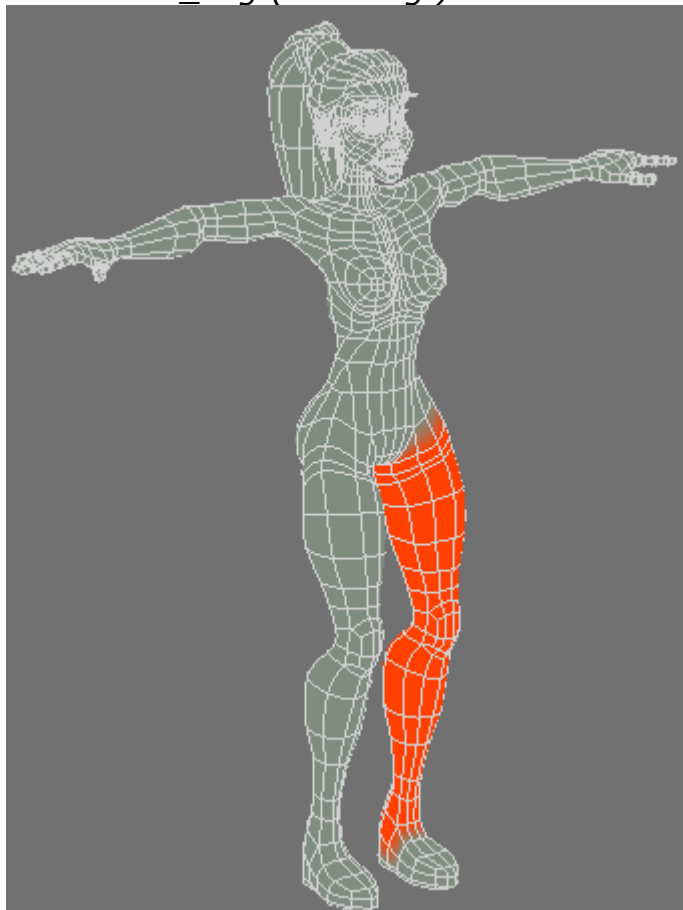
*L\_Eye ( Left Eye )*



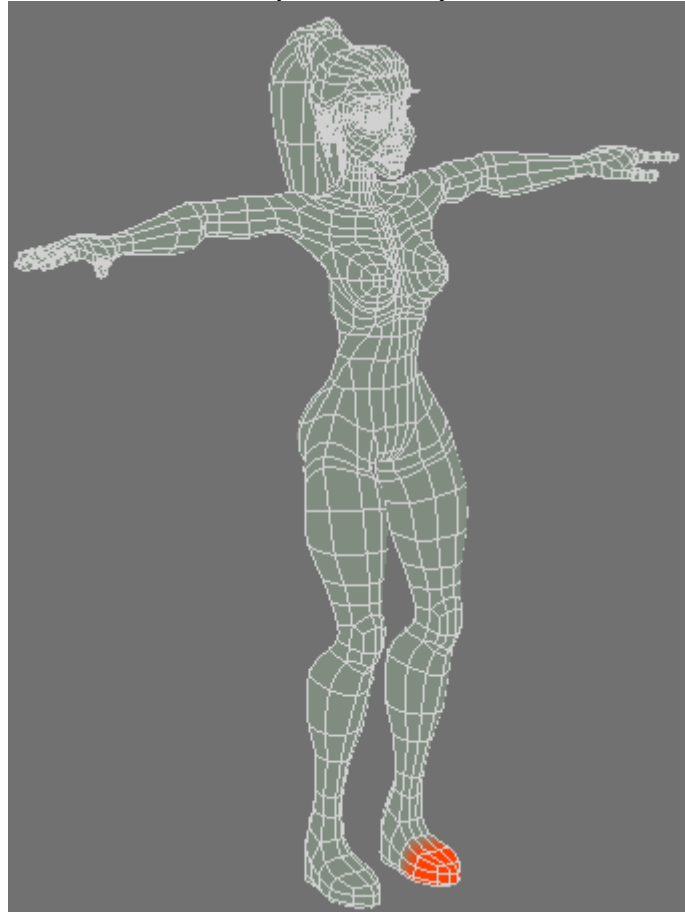
*L\_Foot ( Left Foot )*



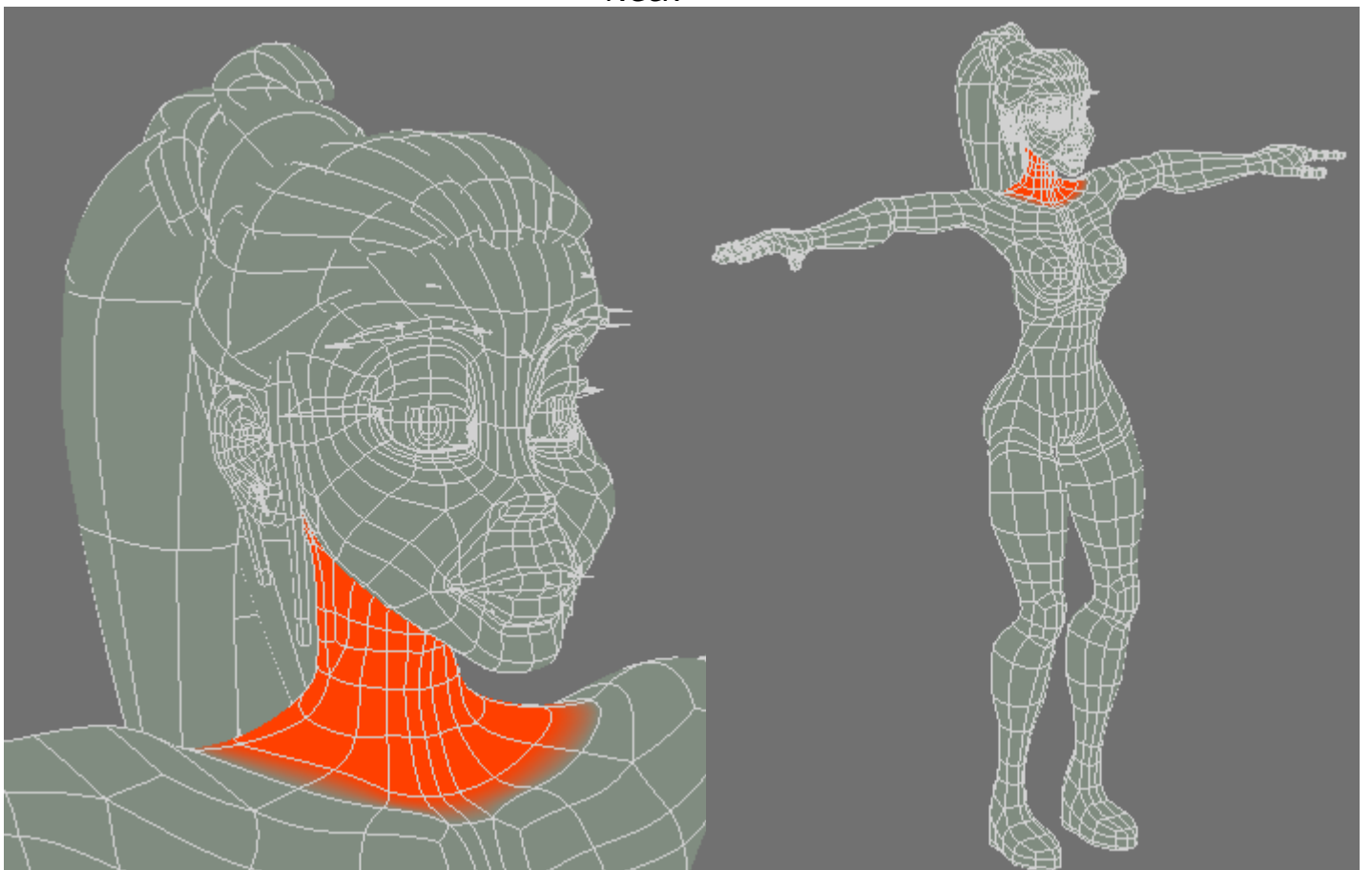
*L\_Leg ( Left Leg )*



*L\_Toe ( Left Toe )*

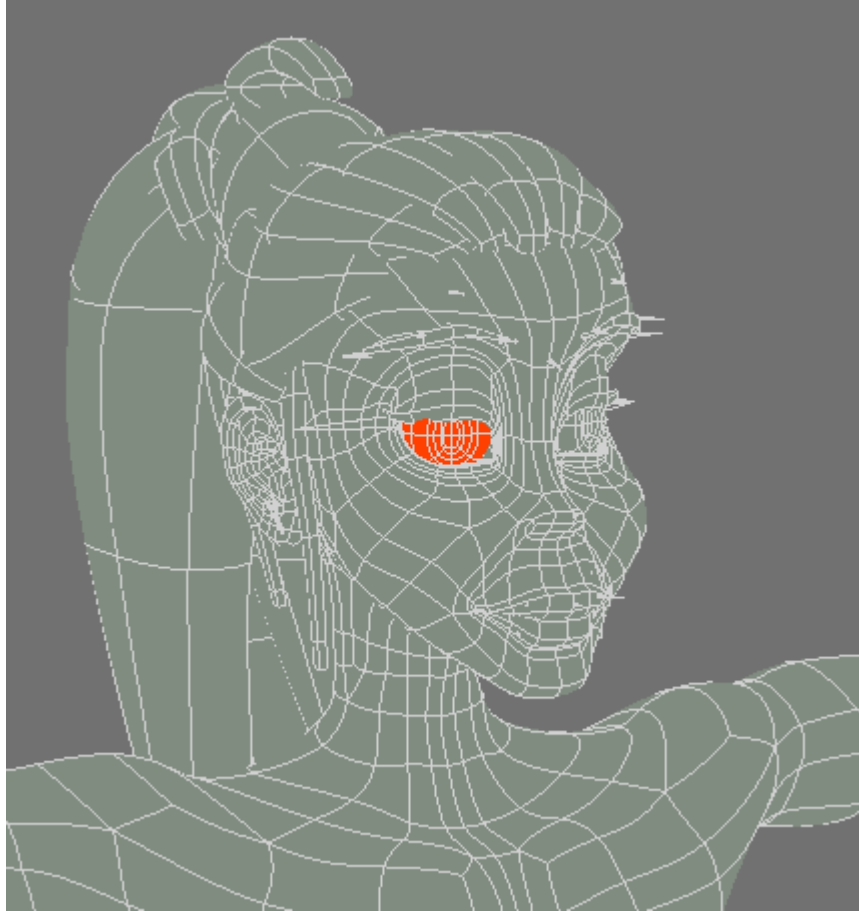


*Neck*

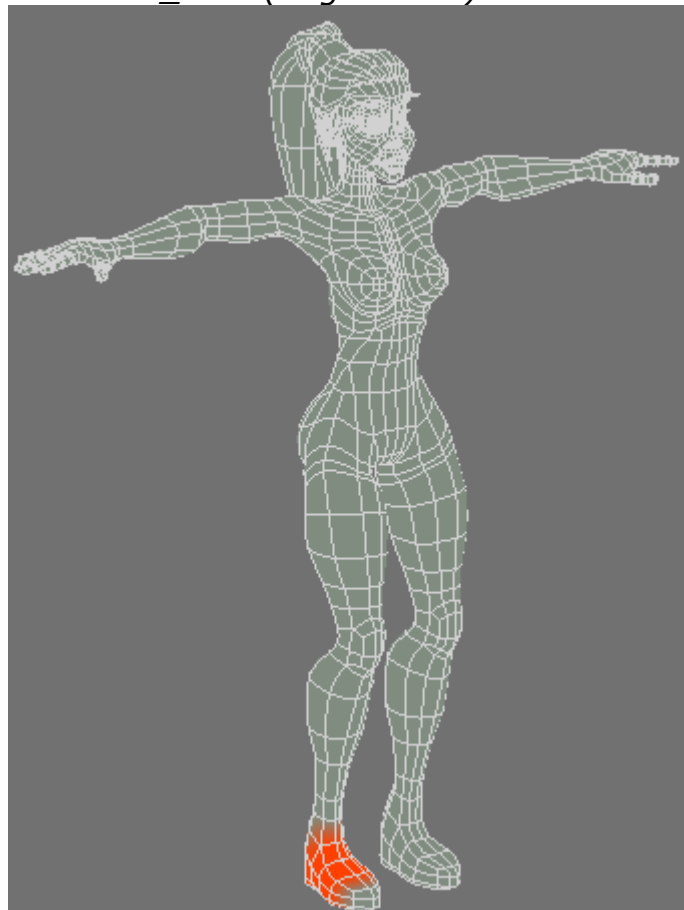


*R\_Eye ( Right Eye )*

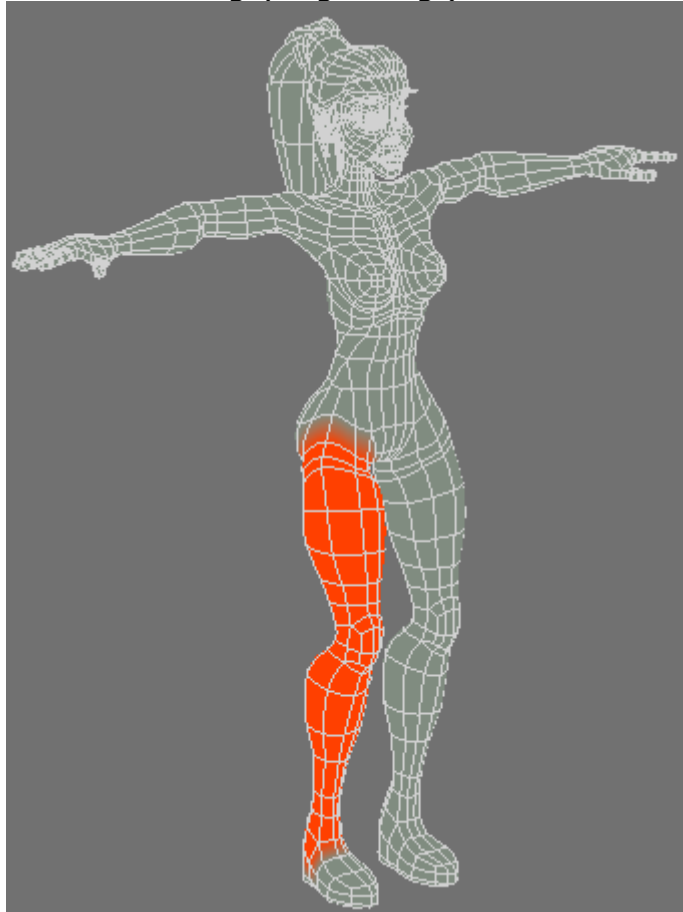
*Tip - Best copy eye to another layer make the weight maps then copy back to layer 1*



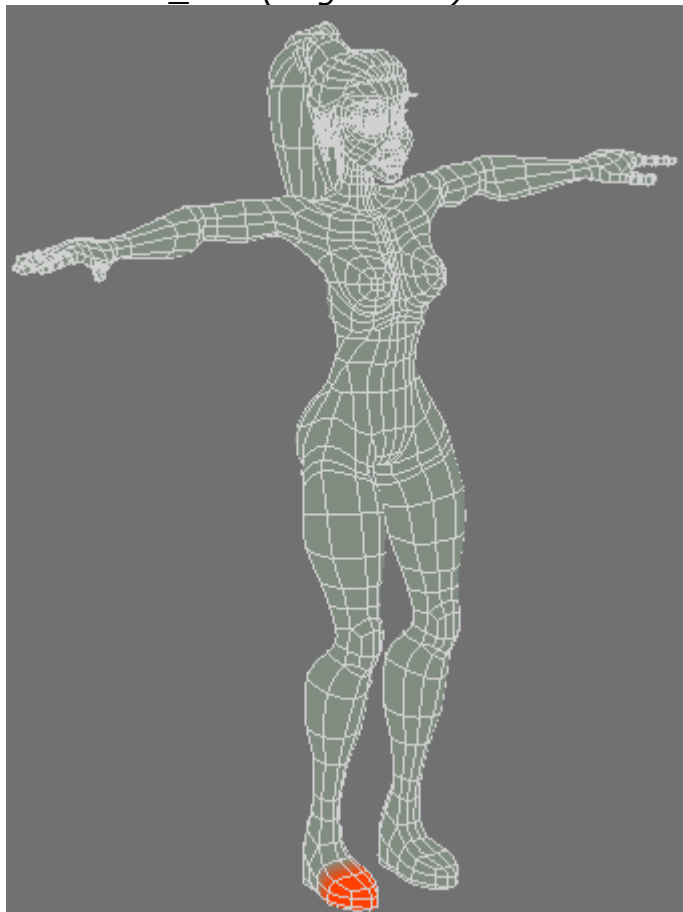
*R\_Foot ( Right Foot )*



*R\_Leg ( Right Leg )*



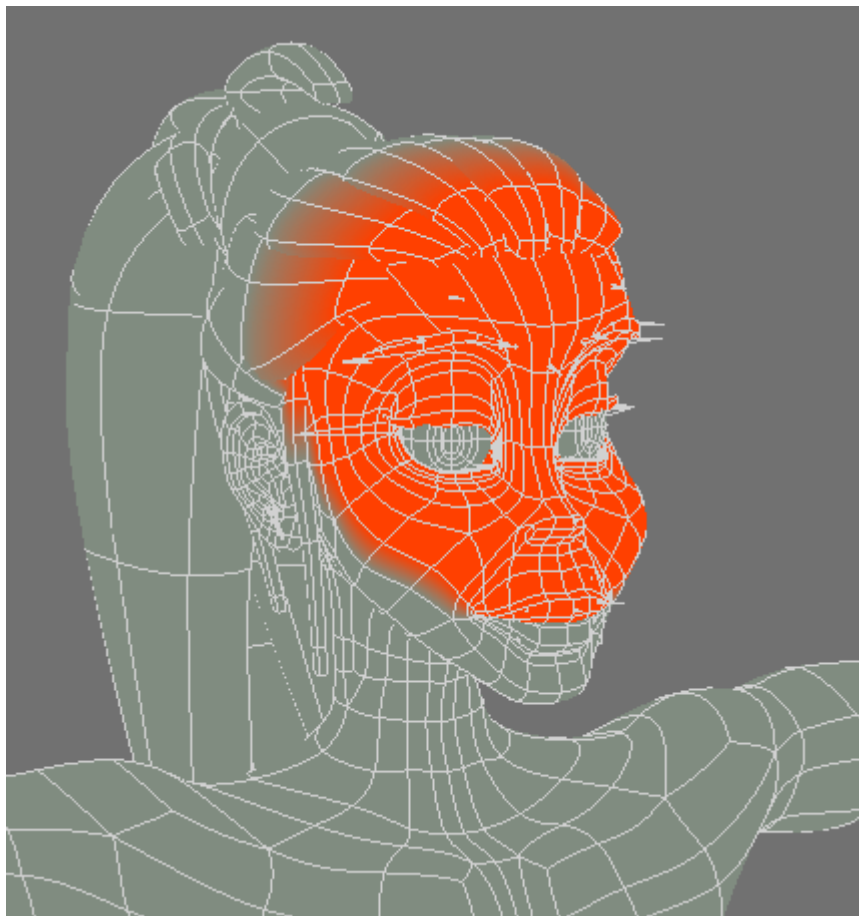
*R\_Toe ( Right Toe )*



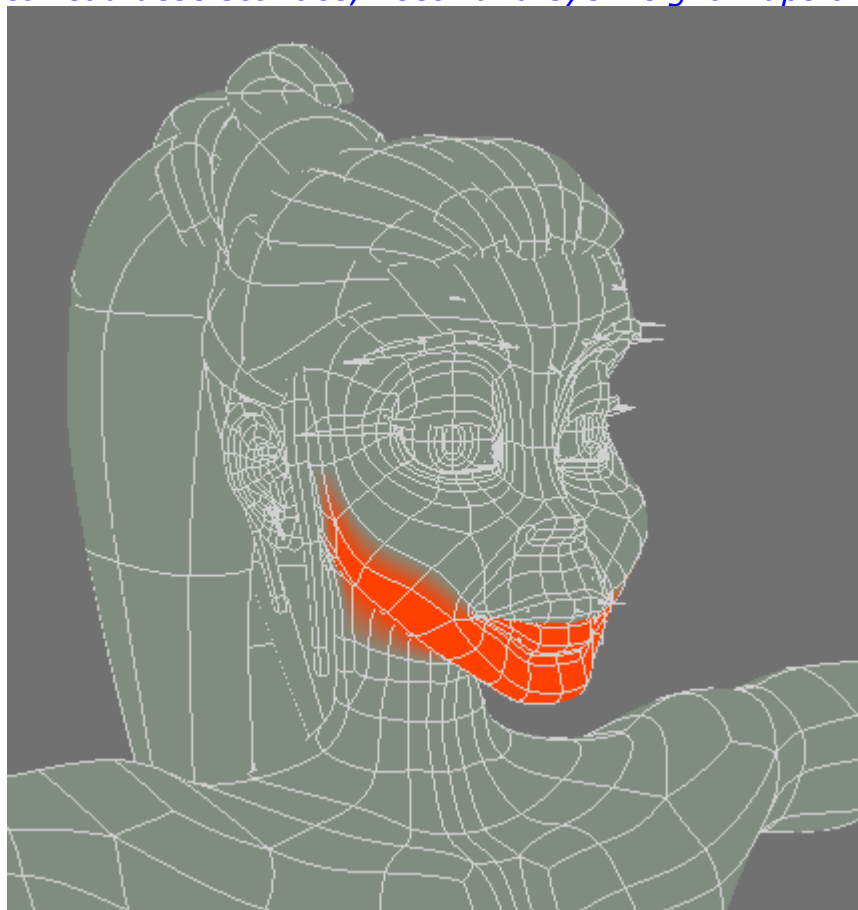
## ***Facual Bone Weight Maps***

*As per the body rig, edit the bones in layer 3 of the content so the bones fill you character. Boned Facual rigs are used to edit/finetune Endomorphs when animating OR if you want a quick Facual rig for a Background character without the need to spend time making all thoses Endomorphs Bone Facual are very usefull*

*Face*



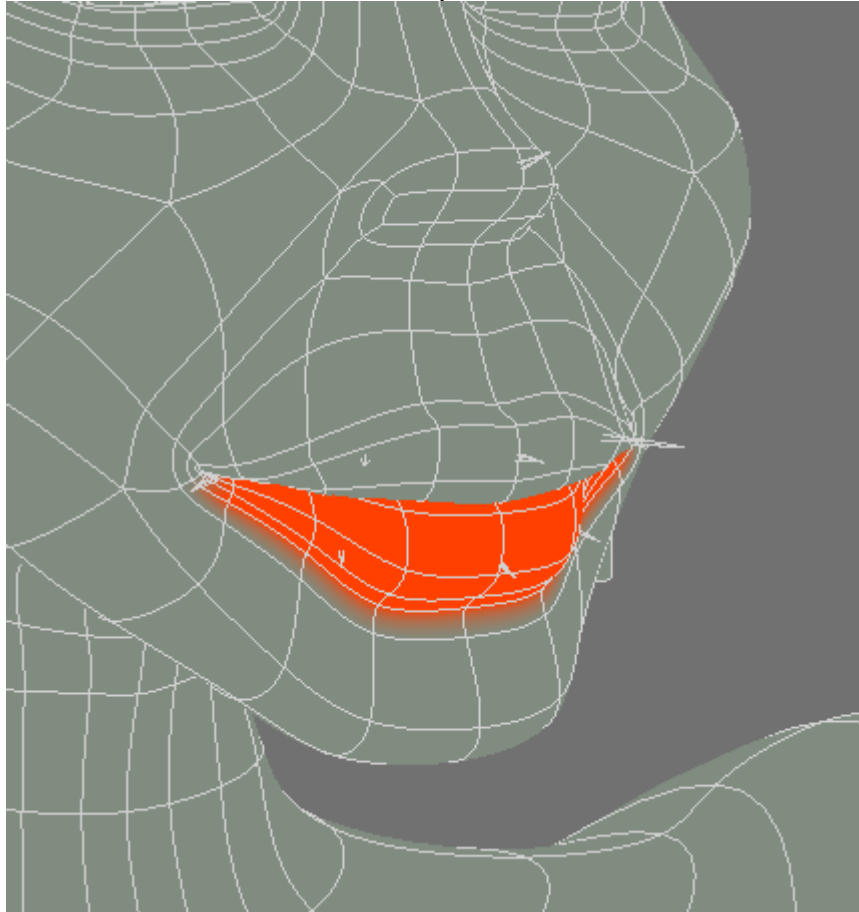
*Jaw Tip - Select head deselect Face, Teeth and eye weight maps then create*



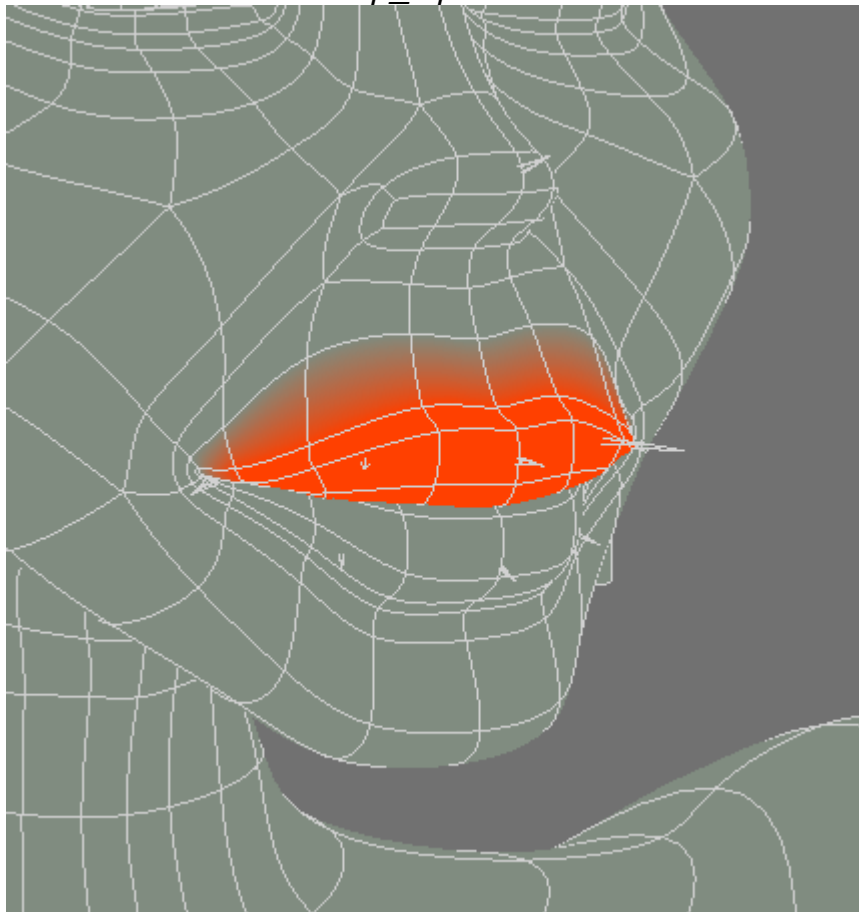
*Lip Edge*



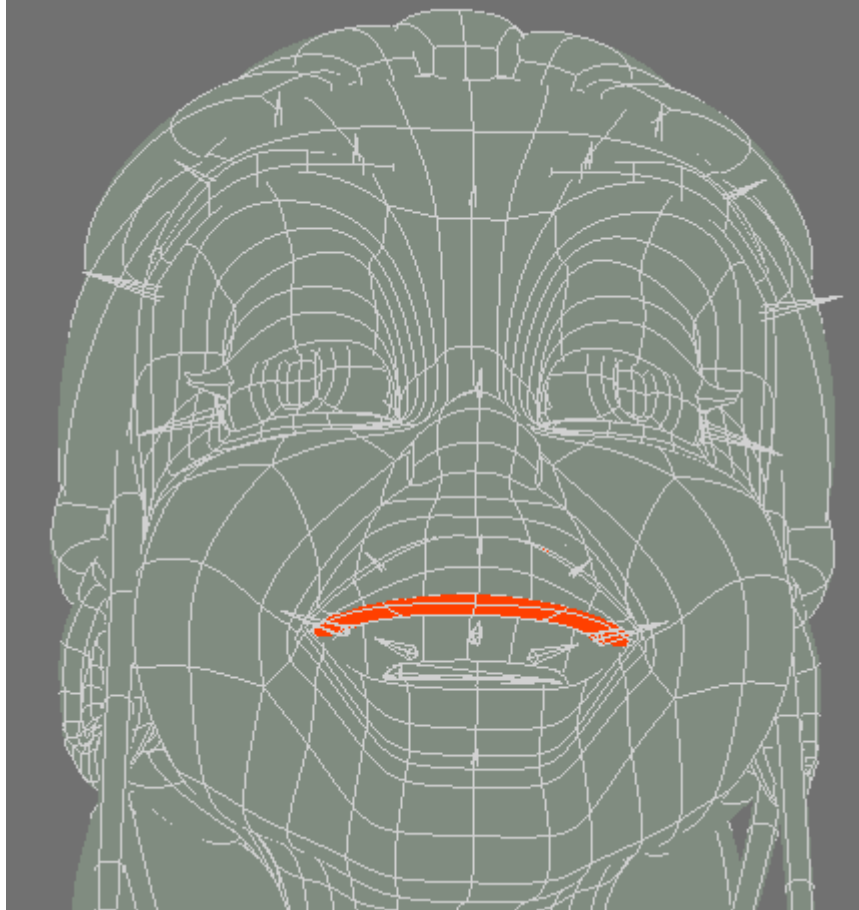
*Low\_Lip*



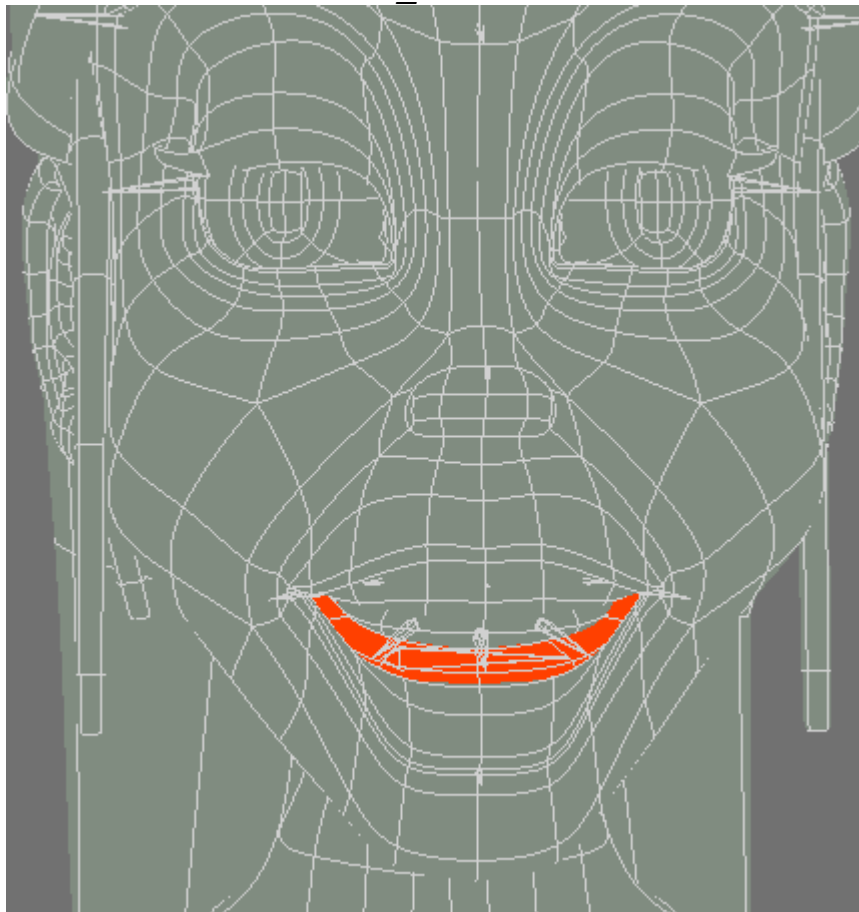
*Top\_Lip*



*Teeth\_Up*



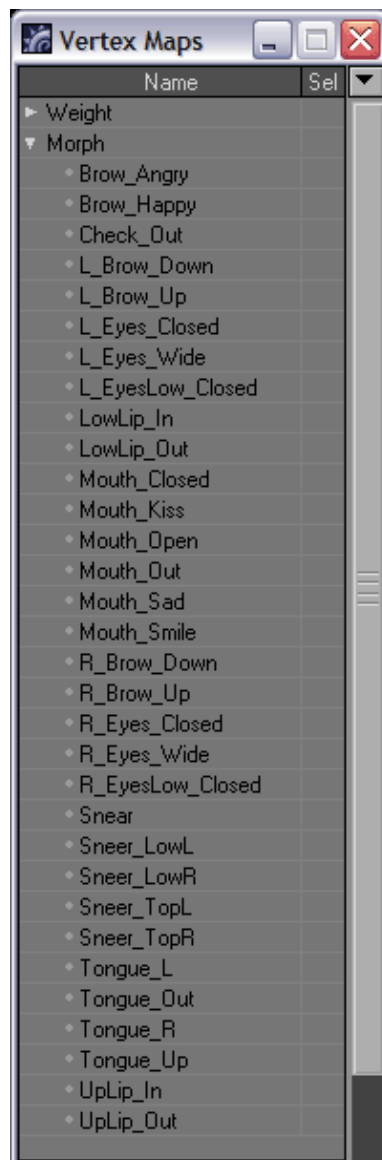
*Teeth\_Low*



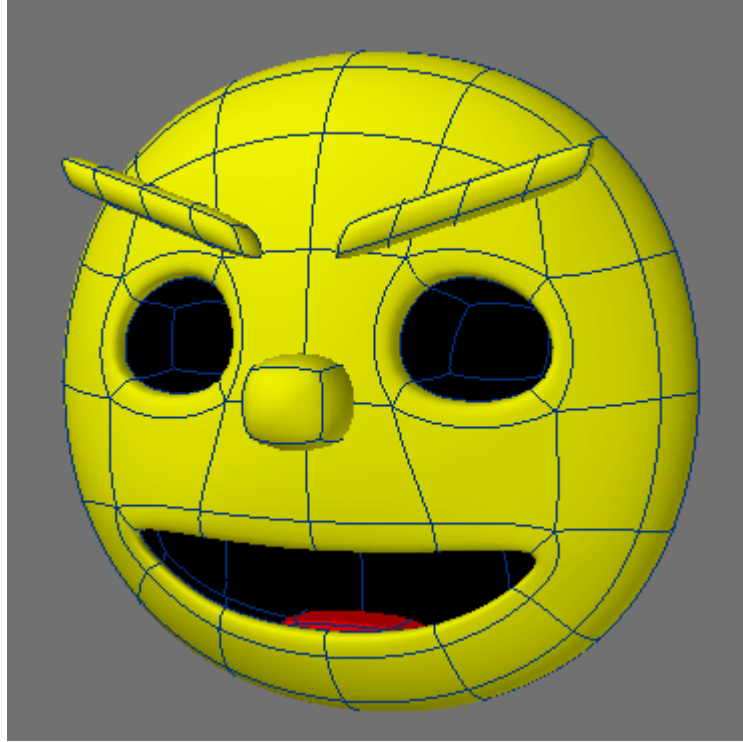
# Joystick Facial Rigging

Joystick Facial Rig are a great way to control lot of endomorphs with minimum Keyframes. This method has only just started to be used by 3D artists to animate facial expressions, A great book Covering joystick facial rigs and Facial animation in general is Jason Osipa's *Stop Staring From* Sybex publishing this setup is a mix of a lot of ideas from that book but taking advantage of some lightwave Workflow methods

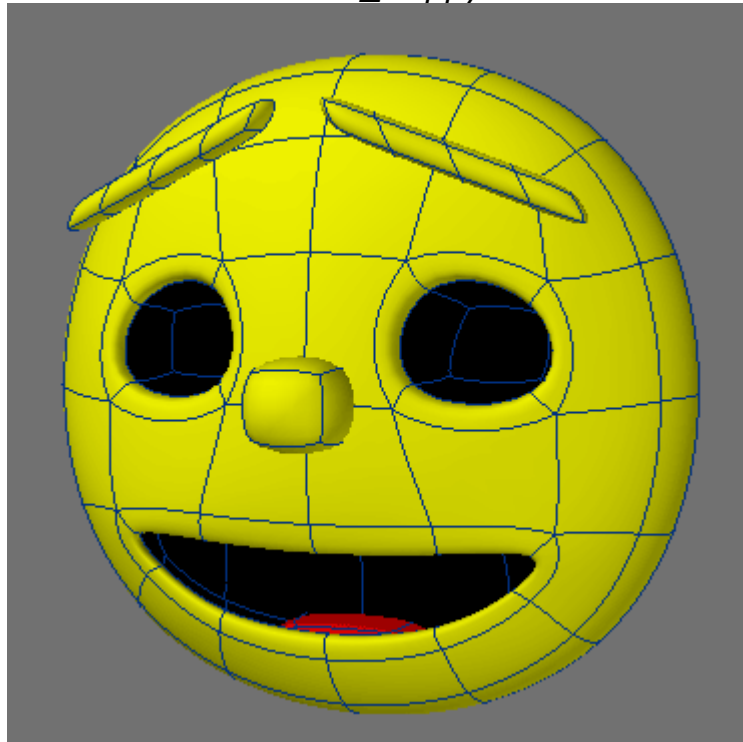
Here's a list of the basic Endomorphs Needed to create a good working Facial Joystick rig in Lightwave. Extra Joysticks can easily be added Base scene is included in the content as well as an Expression Library include all 4 way & 8 way joystick expression needed to create your own Facial rigs



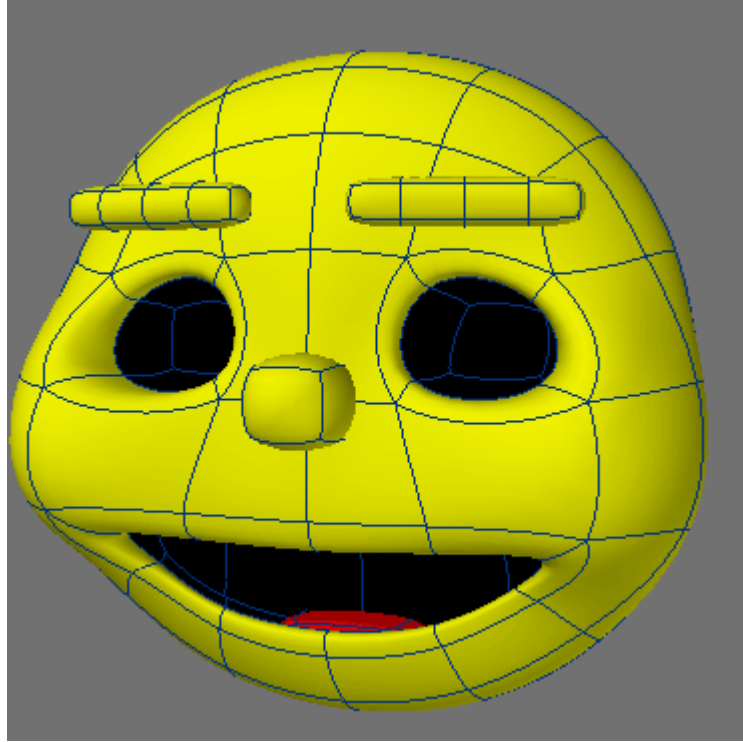
*Brows\_Angry*



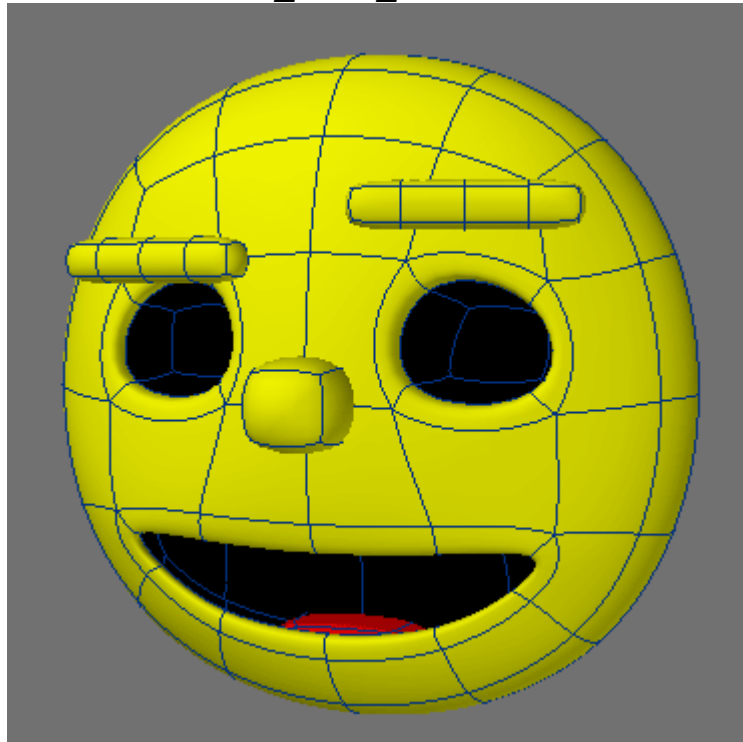
*Brows\_Happy*



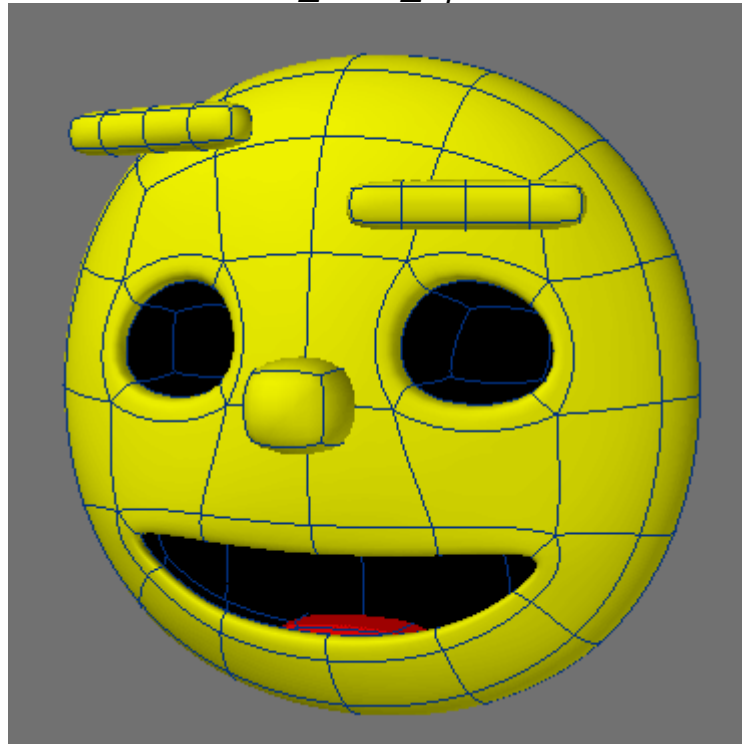
*Cheek\_Out*



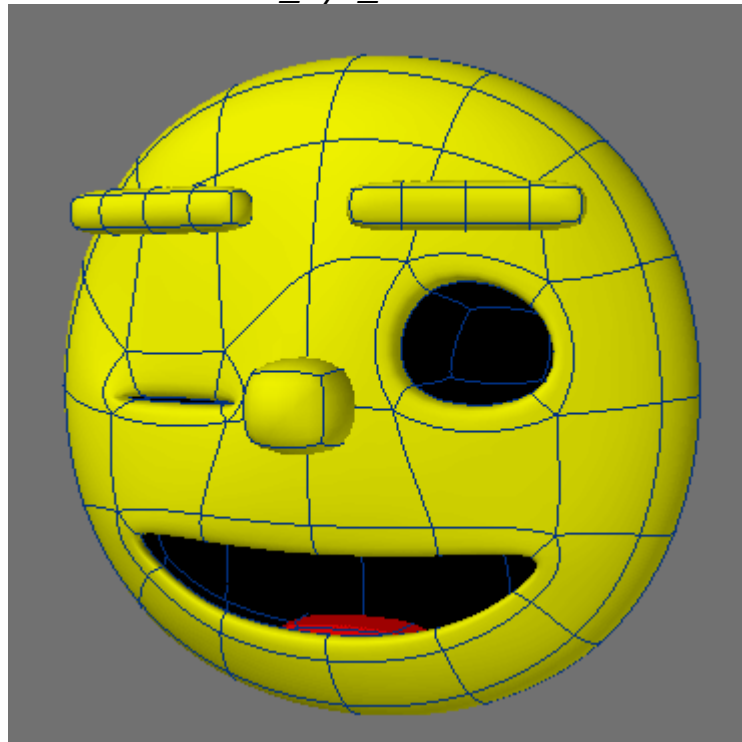
*L\_Brow\_Down*



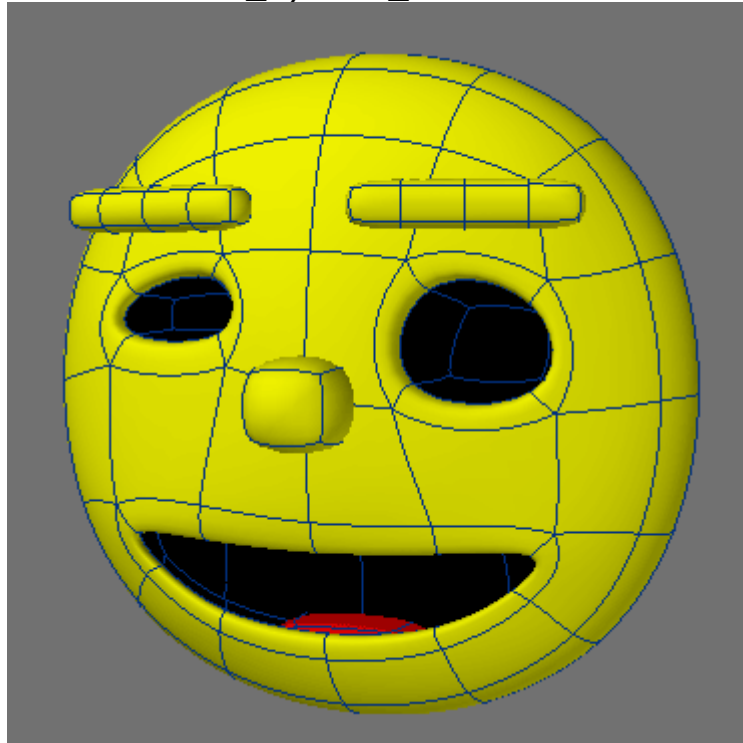
*L\_Brow\_Up*



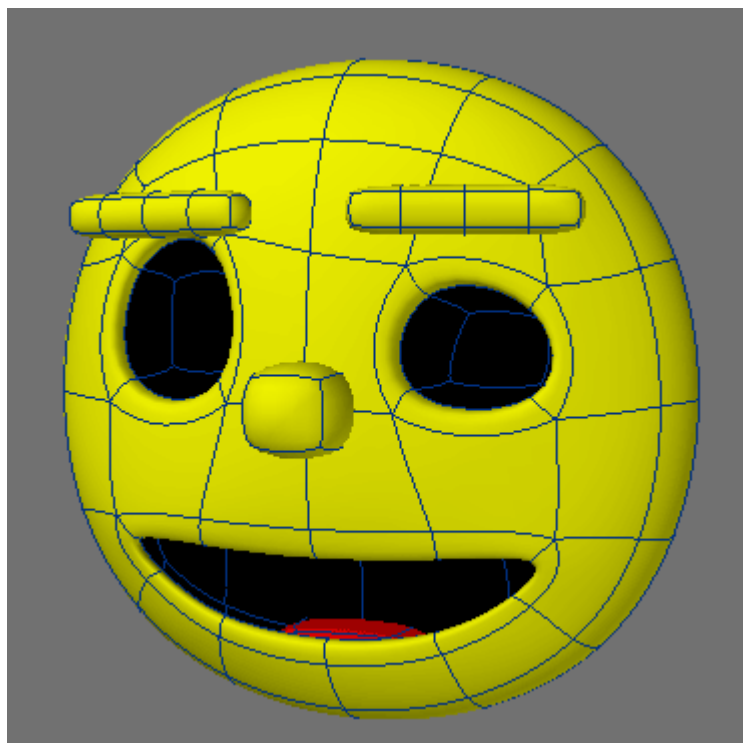
*L\_Eye\_Closed*



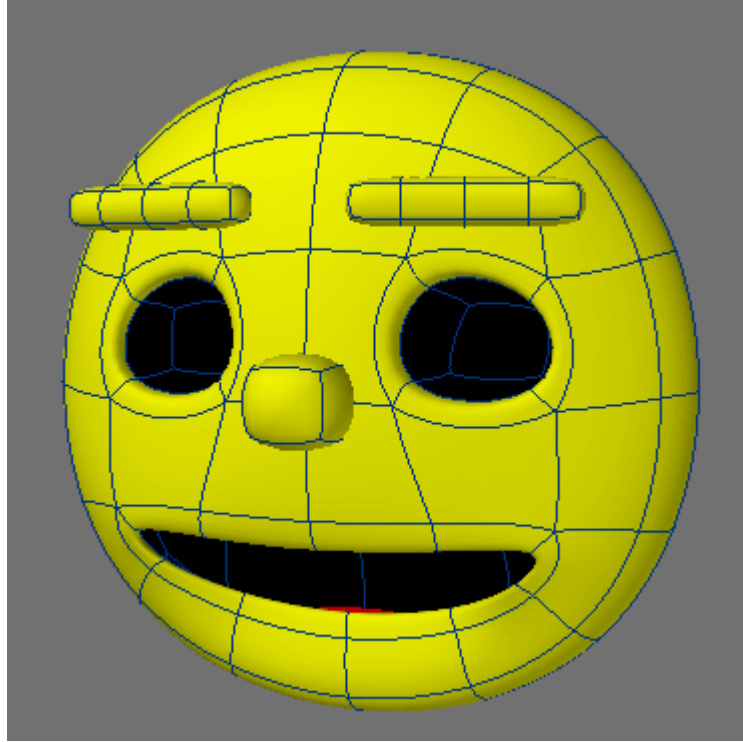
*L\_EyeLow\_Closed*



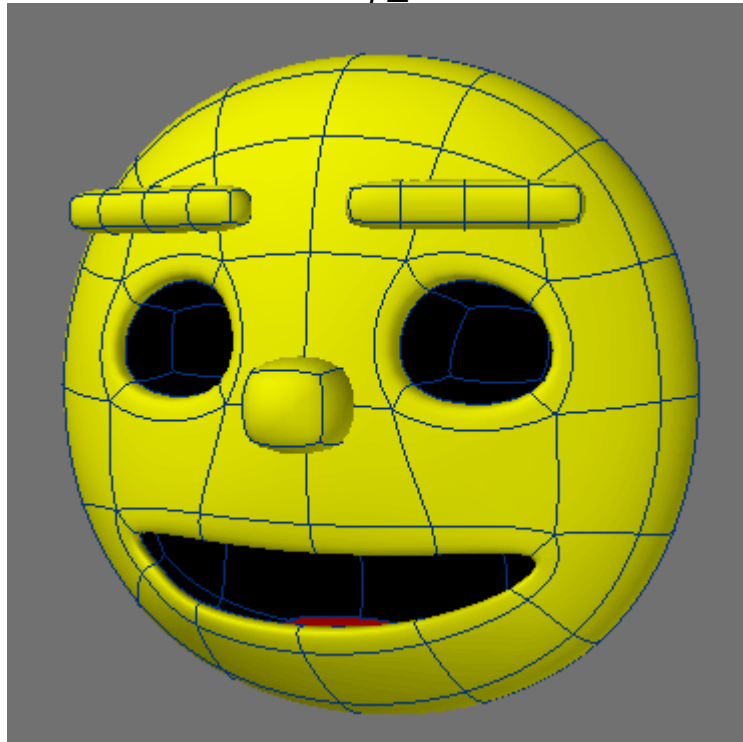
*L\_Eye\_Wide*



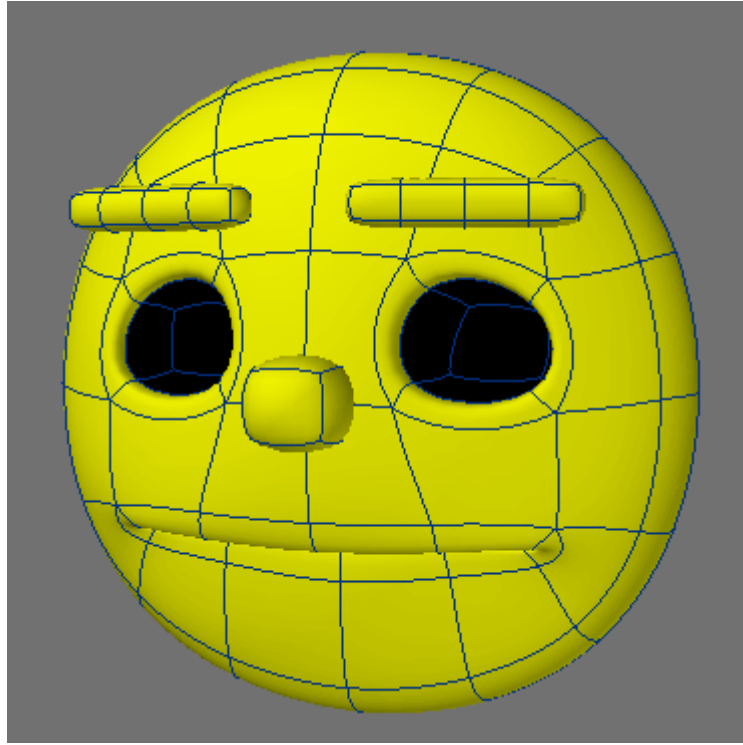
*Low\_Lip\_In*



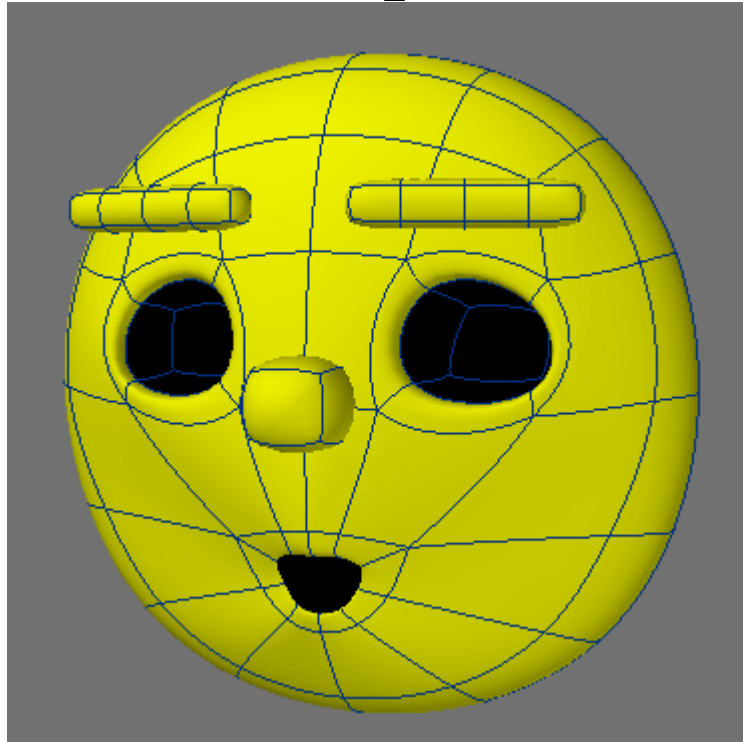
*LowLip\_Out*



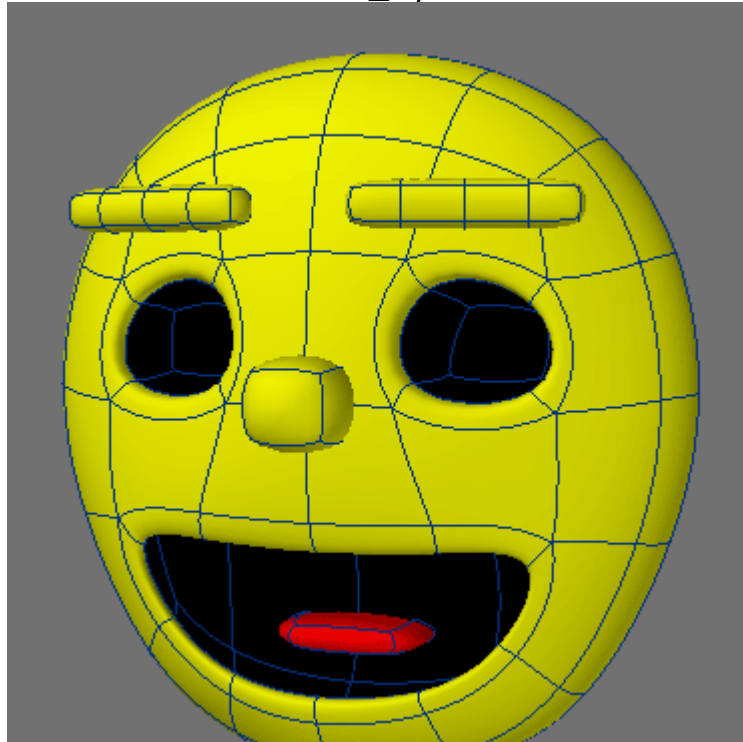
*Mouth\_Closed*



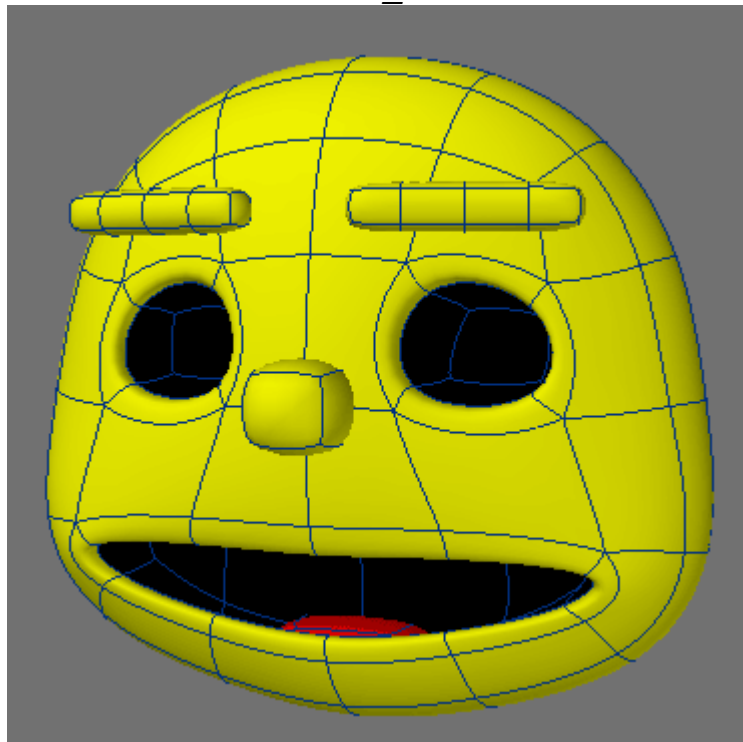
*Mouth\_Kiss*



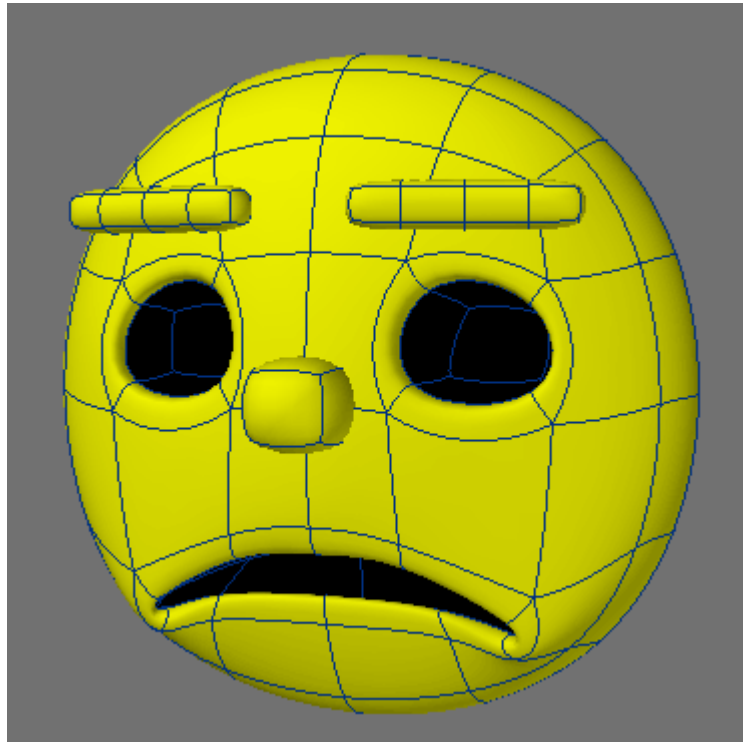
*Mouth\_Open*



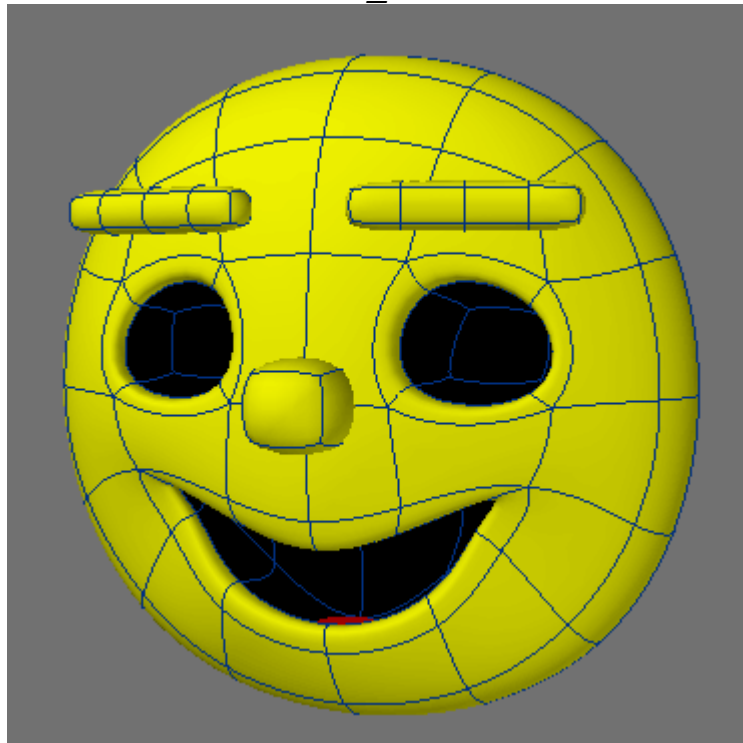
*Mouth\_Out*



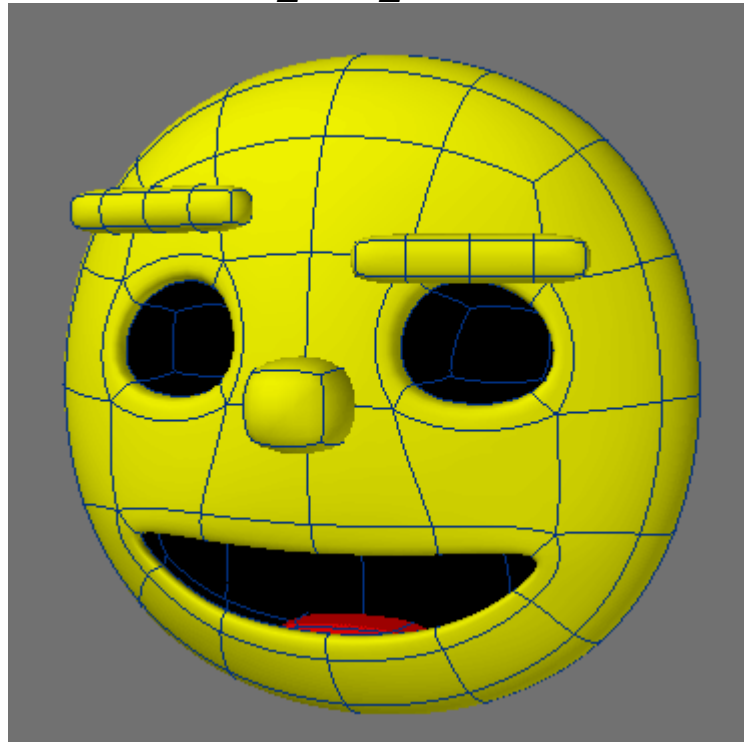
*Mouth\_Sad*



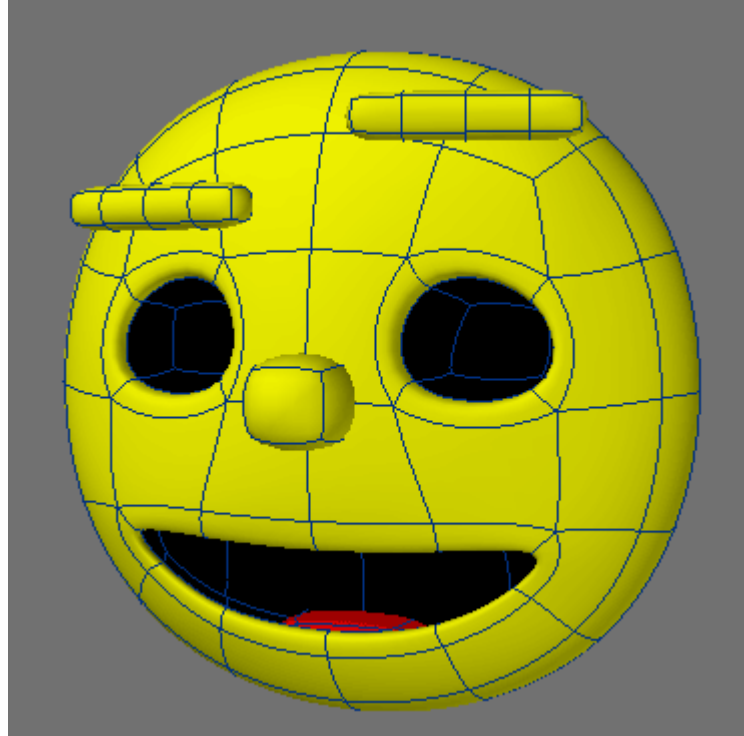
*Mouth\_Smile*



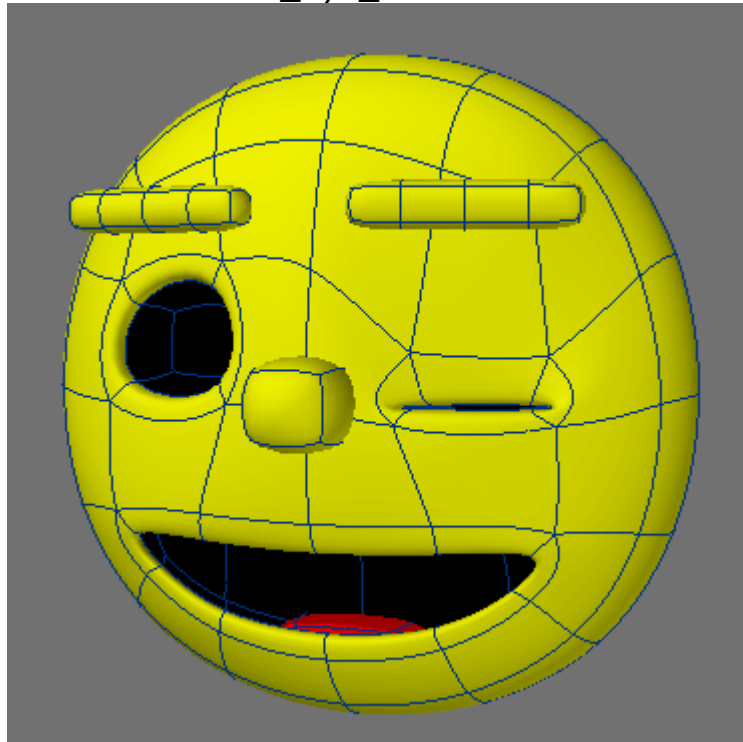
*R\_Brow\_Down*



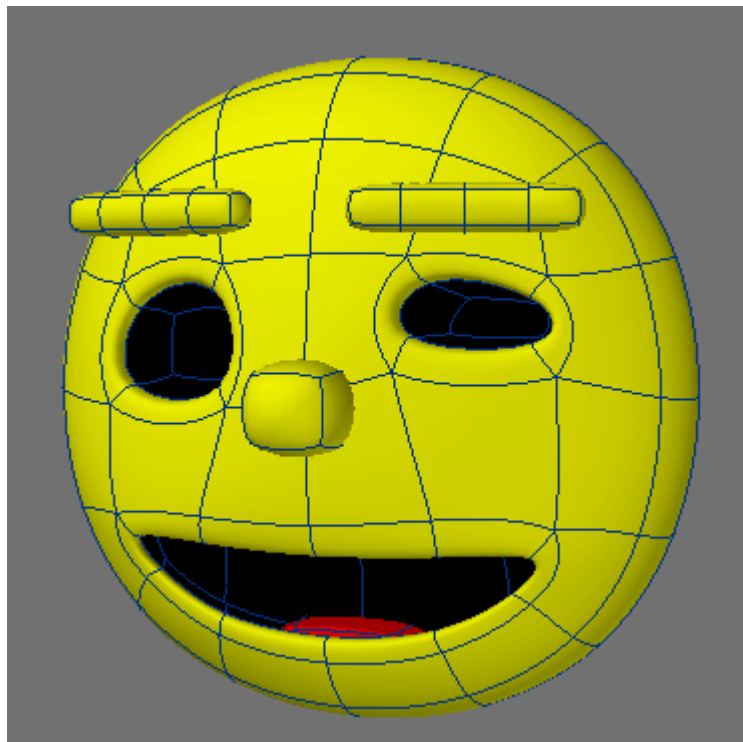
*R\_Brow\_Up*



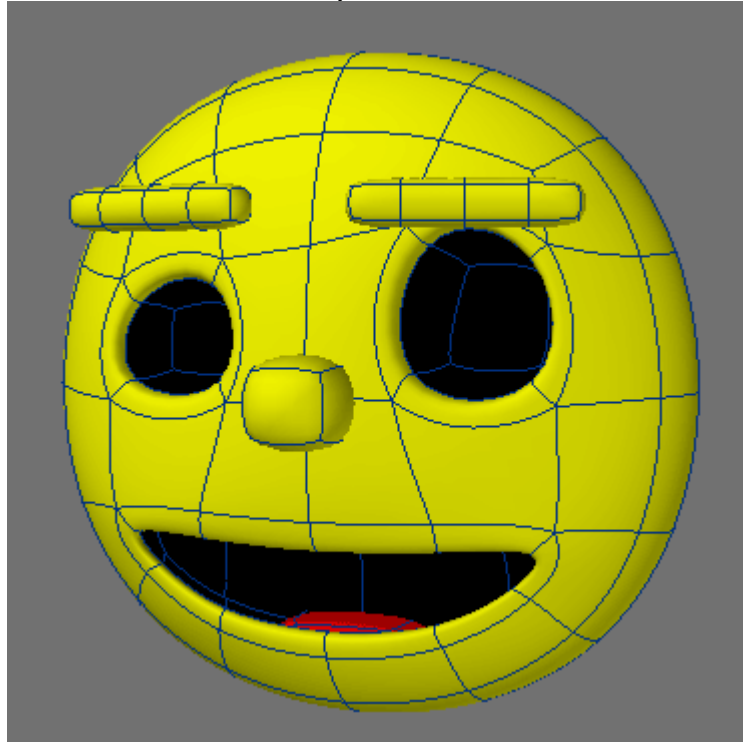
*R\_Eye\_Closed*



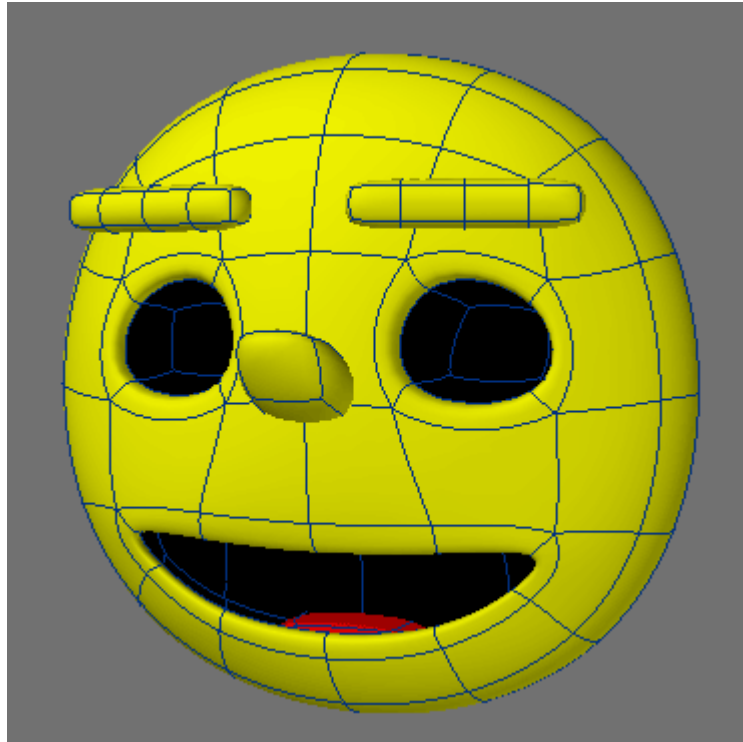
*R\_Eye\_Low\_Closed*



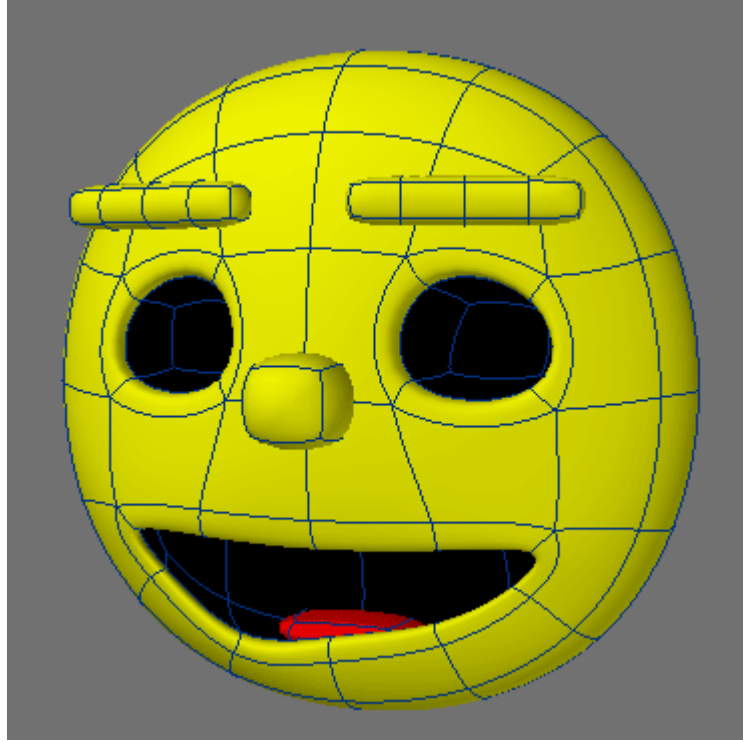
*R\_Eye\_Wide*



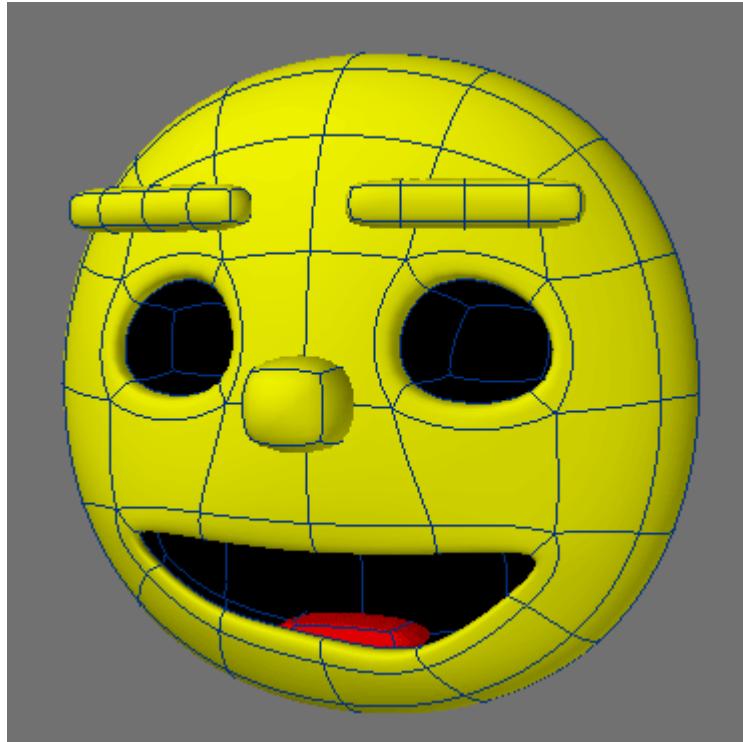
*Sneer*



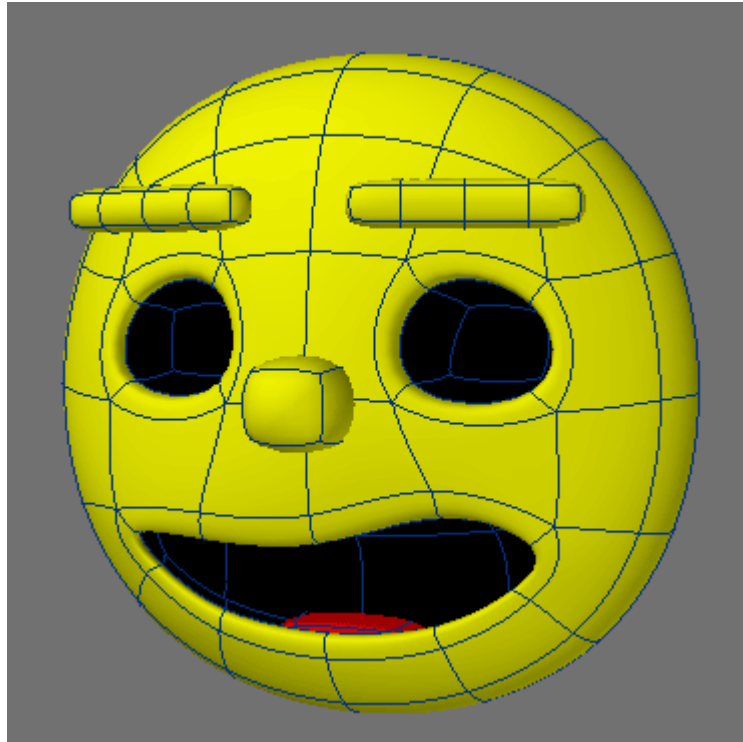
*Sneer\_LowL*



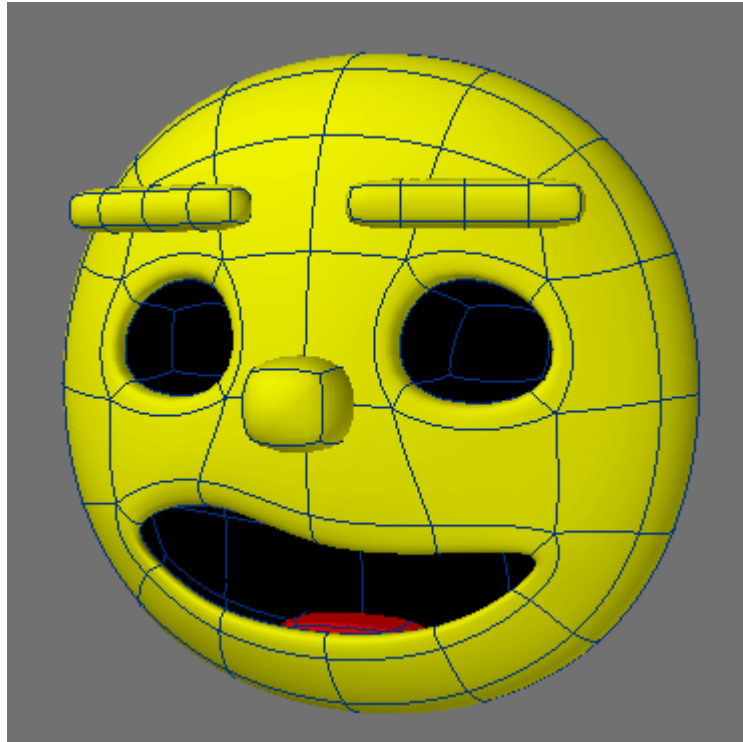
*Sneer\_LowR*



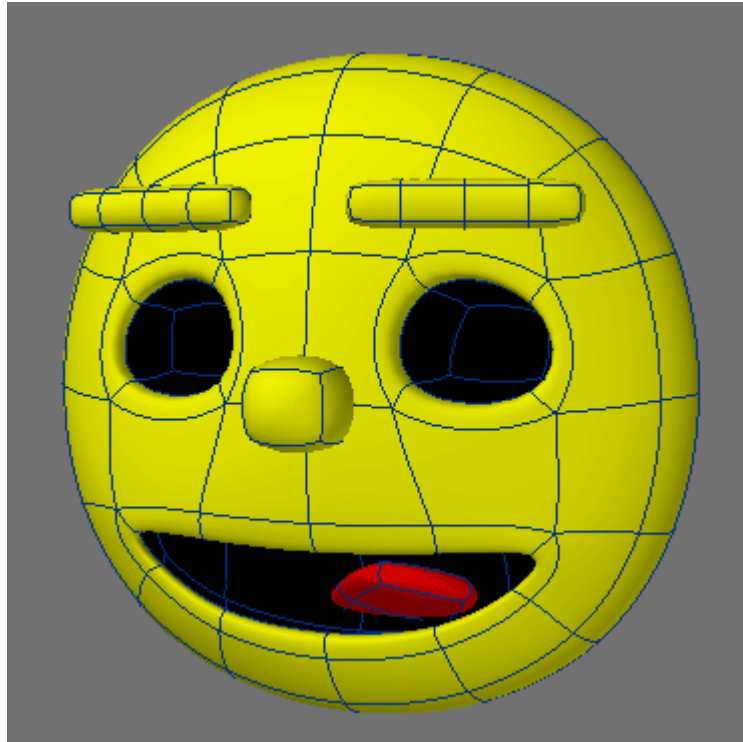
*Sneer\_TopL*



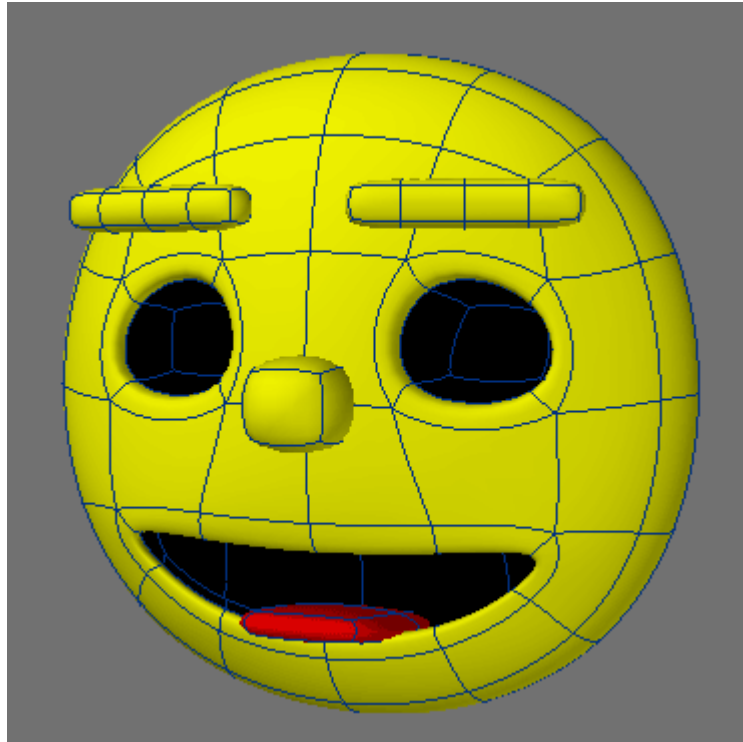
*Sneer\_TopR*



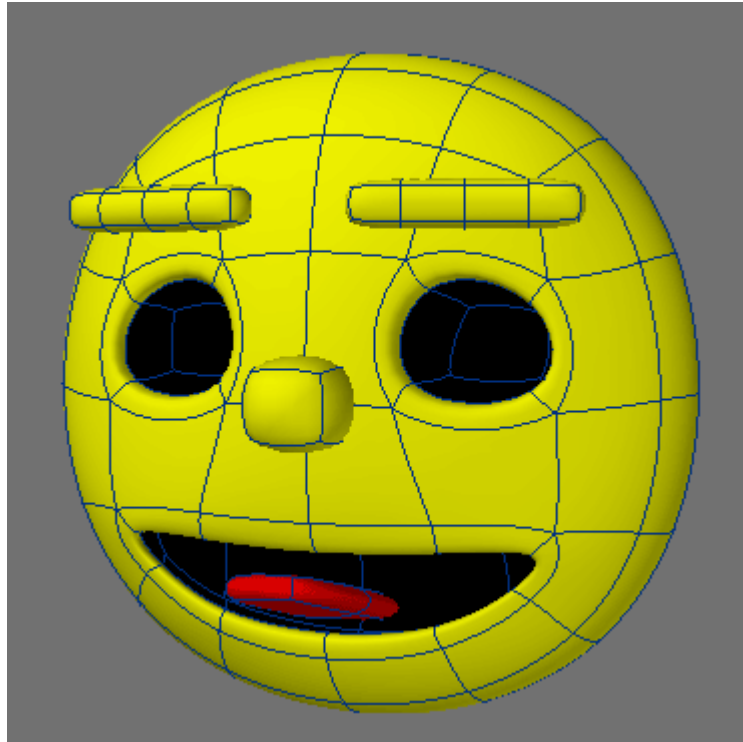
*Tongue\_L*



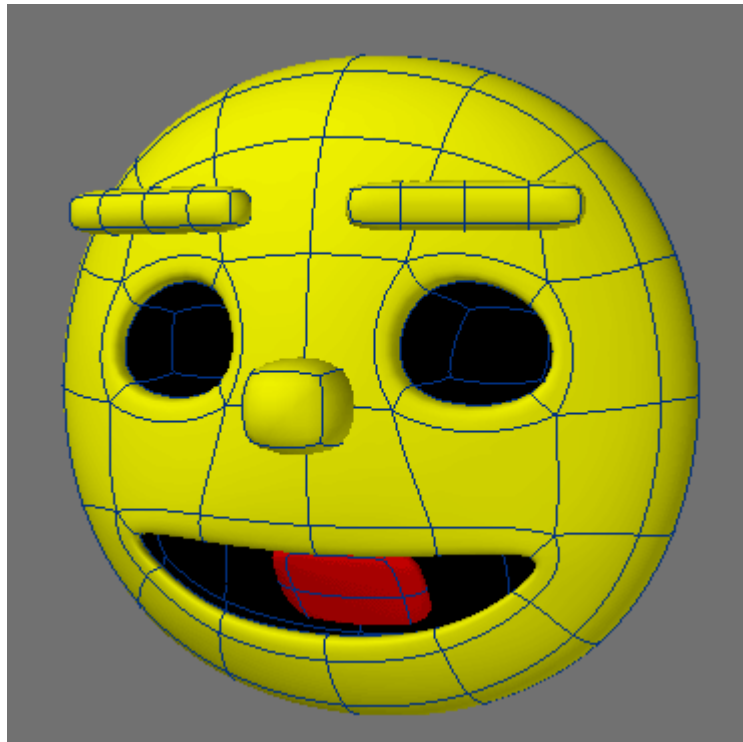
*Tongue\_Out*



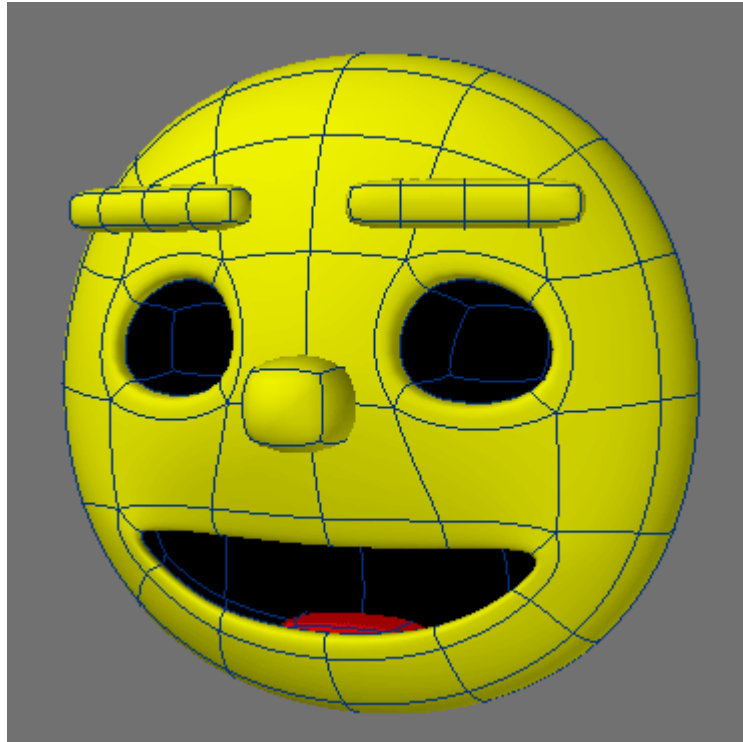
*Tongue\_R*



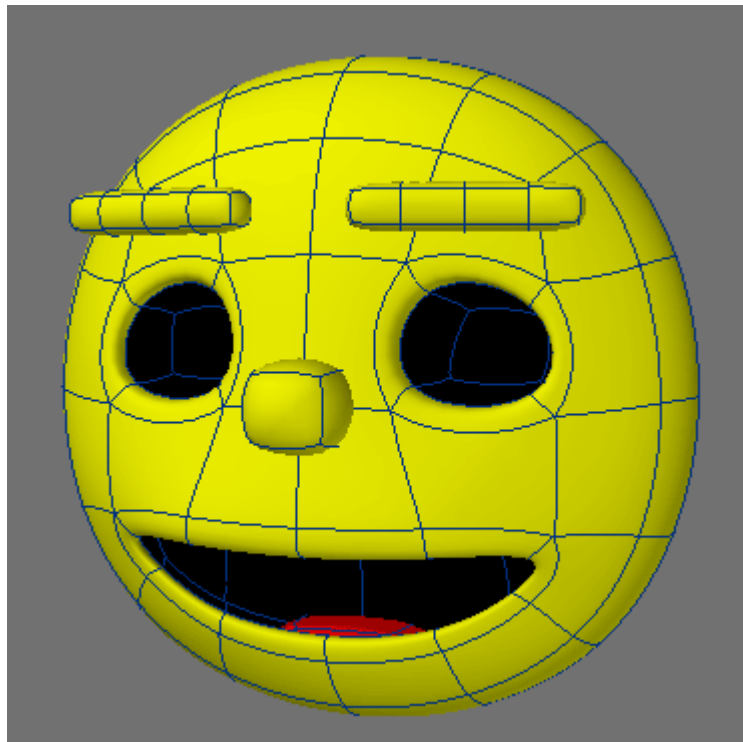
*Tongue\_Up*



*UpLip\_In*



*UpLip\_Out*



## Fastest Way to Create a Full joystick Rig

Create endomorphs as per Above Names ( You can just rename existing endomorphs to fit this name convention ) make sure your character is name T4D\_Rigger.lwo now load into Layout then uses load From scene using the Supplied Facial joystick Base scene this scene is already setup if you have the same object name AND the same endomorph names the load from scene operation will have the joystick controlling Both your character and the Yellow Head, Now delete the yellow head and you have a Full Joystick ready to go ;)

## Now Making You Own Joysticks

1/ Create 2 nulls name them Base and pointer\_1 and give them different item shape .( Object Properties > Add Custom Object > Item Shape.) a nice box or a ring if it's a box scale it down to 0 on the Z scale and make it around 0.5 in size and make pointer\_1 a lot smaller then the base around 0.1 in size

2/ with Parent in place ON (Preferences > General Options,) parent pointer\_1 to the base

3/ Now with your model in layout add morph mixer to it to bring up the endomorph's go to graph editor and bring in all the channels in to graph editor and delete all the channels in the bin except the endomorph's and save as a favorites sets.

4/ Press the **Expression** tab and click the **Builder** button. Once expression builder is open and go the the Expression **Builder Basic** tab and select **Utility Functions 101** and Clamped **Map Range**

5/ Now you'll have 5 blank box at the bottom, The first Controller box, select channel and pick the pointer\_1 Y channel Next **Input Min** Number 0 **Input Max** 0.5 **Output Min** 0.0 **Output Max** 10.0 name it Pointer\_up should look like this

```
clamp( ( mapRange([Pointer_1.Position.Y],0.000,0.500,0.000,10.000) ) , 0.000 , 1.000 )
```

6/ Now the values highlighted are the only values you need to change to make the rest of the basic Joystick rig. So keep them in Expression builder  
Now add the expression to your endomorph's that you want to come in when the pointer\_1 is moved on the +Y axis.

7/ Now add a – negative sign in front of the 0.500 so it looks like this

```
clamp( ( mapRange([Pointer_1.Position.Y],0.000,-0.500,0.000,10.000) ) , 0.000 , 1.000 )
```

and call the expression Pointer\_Down

8/ add it to the endomorph that you want to come in when you bring the pointer\_1 down on the -Y axis,

9/ for right and left movement of the pointer we change the Y to X, like this for right movement

```
clamp( ( mapRange([Pointer_1.Position.X],0.000,-0.500,0.000,10.000) ) , 0.000 , 1.000 )
```

and call the expression Pointer\_Right

10/ We change it like this for Left movement

```
clamp( ( mapRange([Pointer_1.Position.X],0.000,0.500,0.000,10.000) ) , 0.000 , 1.000 )
```

and call the expression Pointer\_Left

now you have complete control over 4 endomorph's with one controller

*clone the base and a pointer\_1 and rename Base 2 and pointer\_2 and move the base 2 to a new position And you can continue adding expression and attaching them to endomorph's with the new control. All you have to change in the expression is the pointer name*

# ***F.A.Q***

## **Q- how do i install /update the plugins**

OK first open the plugins directory of your current version of Lightwave 7.5c or 8 if you have a old version move or delete those plugins out of the Lightwave plugins directory

unzip the files and move the directory T4D\_Rigging\_Tools with the sub-directory Face\_Controls to the plugins directory of lightwave

Now open lightwave layout and add the plugins as you would normally

in **LW 8** go to Utilities Tab and select the add or edit plugins button now find teh thomas4D tools directory in the plugins folder and select all of the plugin in the file ( except the T4D\_Face\_Rigger.exp that's a lib for graph editor )

in **LW 7.5c** go to layout Tab up left hen plugins and select the add or edit plugins button now find teh thomas4D tools directory in the plugins folder and select all of the plugin in the file

( except the T4D\_Face\_Rigger.exp that's a lib for graph editor )

a message should come up saying you have installed 16 plugins

now edit the menu's in lightwave by going

In **Lw 8** goto the edit tab top left corner and select edit menu layout and a panel will open up

in the left side of the tab it list all the Lightwave commands open the plugins tab move to the T section and selection all the new plugin there with T4D in the name

and then in the right side it lists all teh Menus open one of the tabs under Main Menu and place the plugin where you would like them to be ( Personally create a new group called T4D Tools and place them there )

In **Lw 7.5c** goto the Layout tab top left corner and select interface and select edit menu layout and a panel will open up

in the left side of the tab it list all the Lightwave commands open the plugins tab move to the T section and selection all the new plugin there with T4D in the name

and then in the right side it lists all teh Menus open one of the tabs under Main Menu and place the plugin where you would like them to be ( Personally create a new group called T4D Tools and place them there )

and that's it you have installed the plugins.

## **Q- theese Thomas4d\_Rigger & Thomas4D Control file names are Too BIG can I change them ?**

A- Once you run the scripts

just save the model in layout with a new name to where ever you like

also you can save the Control objects with a new name to where ever you like too save the scene after you have done this, and all will be fixed.

## **Q- why make a Boned face rig what wrong with teh endomorphs/ joystick rig**

they are 3 options for face animation

1/ the normall endomorphs setup with slider Basic setup A,E,O,B,F & M this is a good method

but you always add lots of other like smile, sad, brows up etc and you can end up with 20 or 30 slider this is nicer to control in LW 8's new morph mixer, but controlling and keying all of them can turn into work

2/ Joysticks controlling 4 up to 8 endomorphs controled by one keyable object. Can be setup in lots of different ways you can tie the standard A,E,O,B,F, M smile & sad to one joysitck or design a new system where each joystick controls each part of the face

( this type system is shown in the content for my tools But T4D face rigger can setup the endomorphs to joysticks any way you like )

this is a better system because you can control around 50 or up 88 endomorphs with 11 keyable objects Alot of fun to animate with BUT the down side is Making all those endomorphs ( this is what got me thinking about bones making all those endomorphs because it does turn into work after awhile.... )

3/ Bones No more making endomorphs you have a fully rigged character including face in under 15 mins you create your base face shapes A,E,O,B,F & M in Layout In negitive frames and just paste the keys to the the correct frame when needed

you also have complete control over the face as you animate you can fine tune the shape anytime no going back to Modeler you can grab any apart of the face and just move, rotate or scale the bones where you want it when animating

you can used the joystick/Endomorphs rig as well as the bones rig on the same face

Downside you have to create 9 weight maps in modeler and you might have to fine tune them ( blur weight maps works well as always ) and maybe even move some bones around but LW 8 comes to play here and makes this Easy

it's Super Fast at Rigging and it totally rocks it does have limits to how far you can push the bones before they distort the face too much, But I think that understandable and the fact you can uses endomorphs with it makes any tidy up needed easy too.

## **Q -I get error R\_Hip is not in the scene ?**

A- Make sure you have used skelegon from one of the example Characters there should be 94 bones in total if you paste the skelegon twice in to the character layer layout will rename all the bones with a (1) or (2) at the end so the name would have been change due to have 2 of the same named bone

### **Q- Can i uses your tools to rig Poser characters for Lightwave**

I Rig poser characters with it myself

the basic rig works as it does with everything else very Cool

BUT you have to spend more time on creating weight maps correctly

the main reason for this is poser character have ALOT of polygons and you want to get a nice fall on the weight maps which is hard with all those polygons

but you can get it work just takes alittle bit more time

afew tips

Overlap the weight maps eg upper arm goes down past the elbow, lower arm goes up past the elbow this just a better joint deformation

the hips and upper legs is the tricky bit to overlap and get correct

make 3 or 4 different upperleg and hip weight maps with difrferent levels of over lap

then in layout select the different weight maps for the bones to test how they deform

you can raise & lower the strenght on the hip bones to fine tune it as well

also get blur weight maps from [www.flay.com](http://www.flay.com)

### **Q- can I change the shoulder setup or setup my own IK feet**

A- Yes you can do any changes you need to the rig they are no plugin Expression on the main body rig is it is ready for anything you got ready for you to add in your own Expression and plugin for your character the plugin create a nice professional rig but can always be added to when needed

### **Q- The Script isn't working What do I do ??**

A- First make sure your using Lightwave 7.5c or above

then send me the character file = X\_thomas4d\_rigger and the scene file that plug ins creates, we'll help you as quickly as we can [t4d@thomas4d.com](mailto:t4d@thomas4d.com)

**Q- Why is thou using weight maps? Does not layout setup a weight map when you rest the bone? Unless, of course these weights are to correct some minor issue in the mesh.**

"some people " talk about this method too much, this is the old LW 5.6 and below method of rigging we're using LW 8 now.

without adding weight maps to your model my rigging tools still work But !!

1/ There no way it would work on all characters as easy as it does with weight maps I've made a general tool for all characters that can be edited and change to suit anything with some character you just have to use weight maps

2/ I built my tools for the newbie and pro's alike if the Pro's knows the tricks to working without weight maps they can use my tools and i even have the bones there for them to fine tune and use setting weight maps for the bones is it's own button in my plugins you don't have to use it if you don't want to

3/ the user support would be HUGE placing bones and fine tuning them takes some knowledge I can do it myself but weights are a lot more simpler and easy to understand for everyone

4/ I create all the weight maps most characters in 2 minutes

why not use weight maps when it only takes this amount of time ??

5/ even in Lw 8 moving and re-activating bones takes more time than making the weight maps in Modeler

6/ without weight maps you most likely have to edit/move the model ( eg- spread legs apart ) in modeler to fit in with the No weight maps method, I hate doing this. Yes it is simple but then you have a character in layout that you have to re pose to get back to the neutral pose

*eg- both feet in standing position flat on ground ready for any expression you might want to add to keep the feet above the ground at all times*

7/ adding extra bones for basic stuff without weight maps you have big bones affecting polygons they shouldn't so you have to add more bones just to keep the mesh solid

*eg- heel bone needs to be added because the lower & upper leg are affecting the feet make them move very badly*

8/ I fine without weight maps just more work, setting a weight map and it works if there's a little error go back to modeler and blur or edit the weight maps and it works

IF you set on not using weight maps you have to play with

Bones Rest Position, Bone Rest Rotation, Bone Rest Length, Bone Strength,

bone fall off min & max, Falloff type

