

Biped Rigging and Modeling Tutorial by Jahrain

Things You need to know before attempting this tutorial:

- The basics of 3d modeling and texture mapping
- Know what a Vertex is
- Basics of human anatomy
- Know the basics of tag editing in Guerilla
- The basics of any 3d modeling app including Maya and 3ds max
- A basic idea of what rigging is and how skin weights work
- Elementary math skills (u must be able to add numbers that = 1 and divide numbers by 100)

Things that you need to have before attempting this tutorial

- Any 3d modeling app that your are accustomed to using. (this tut covers Maya)
- 3ds Max for exporting or modeling (GMAX is not recommended for export)
- Obj Import Pluggin for 3ds Max (for those who are not modeling in 3ds max)
- Kornman00 (hacked Guerilla for editing skin weights and binding vertexs to bones)
- James Model Importer
- Notepad or Wordpad (to find element numbers)
- Photoshop (for texturing)

Warning!! although rigging is a simple but long and repetative process its gonna take allot of hard work and effort and above all patience to finish your rigged biped. For some it may take a few hours, for others it may be days before completion. This is for those out there who are seriously dedicated to getting there biped ingame, some of these porocesses are confusing and extremely monotonous so do this when u have some time on your hands.

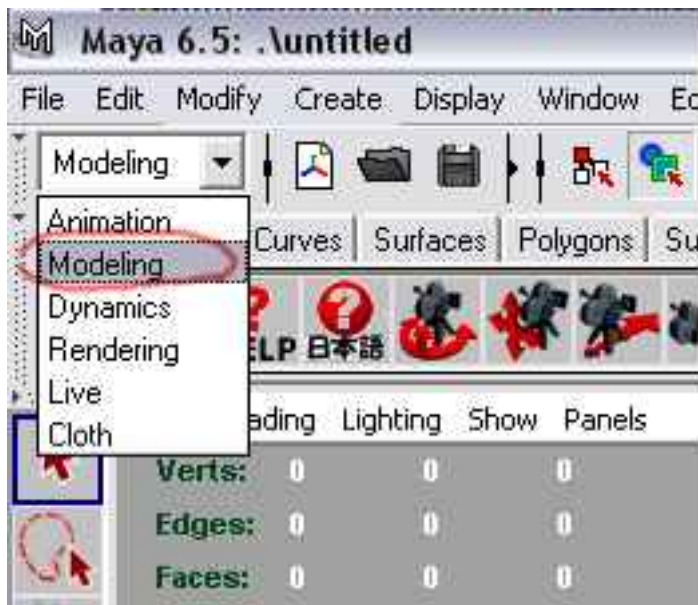
I made this tutorial to go as indepth as possible, advanced users should be able to skip through most of this section

Step 1: Building your Character (Using Maya)

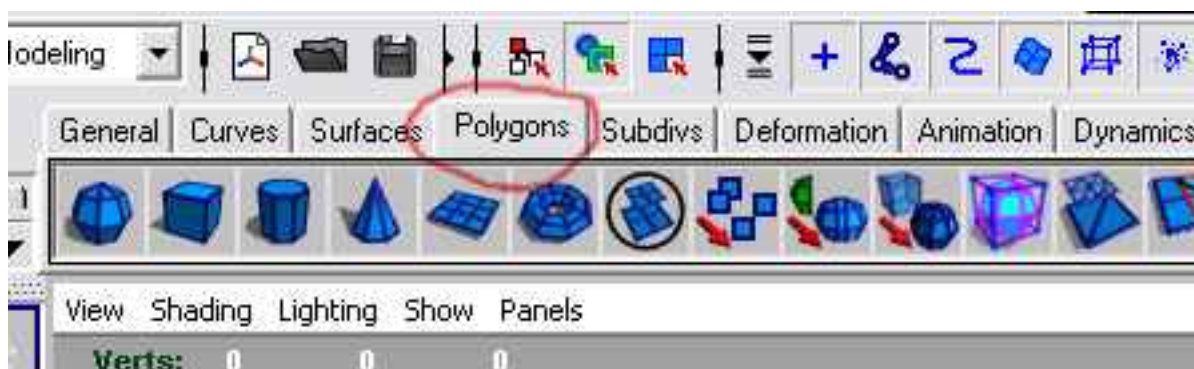
Ok for those of you who already have a character model built u can skip most of this step although its not recommend. This covers character modeling in Maya 6, i too am a noob in 3ds max so i'll be using maya since i have more experience in it. You may use any other program that u want to for modeling though but u will have to find a polygon modeling tutorial elsewhere.

-Setting up a Polygon modeling enviroment

First thing u wanna do is to set the tab under the menu bar to Modeling after opening maya. This shows the menu commands for working with modeling.



next thing you want to do is to set the top tool bar tab to Polygons



now you want the hud on the screen to display how many polygons are being drawn to keep track of how many polygons and verts you are using.

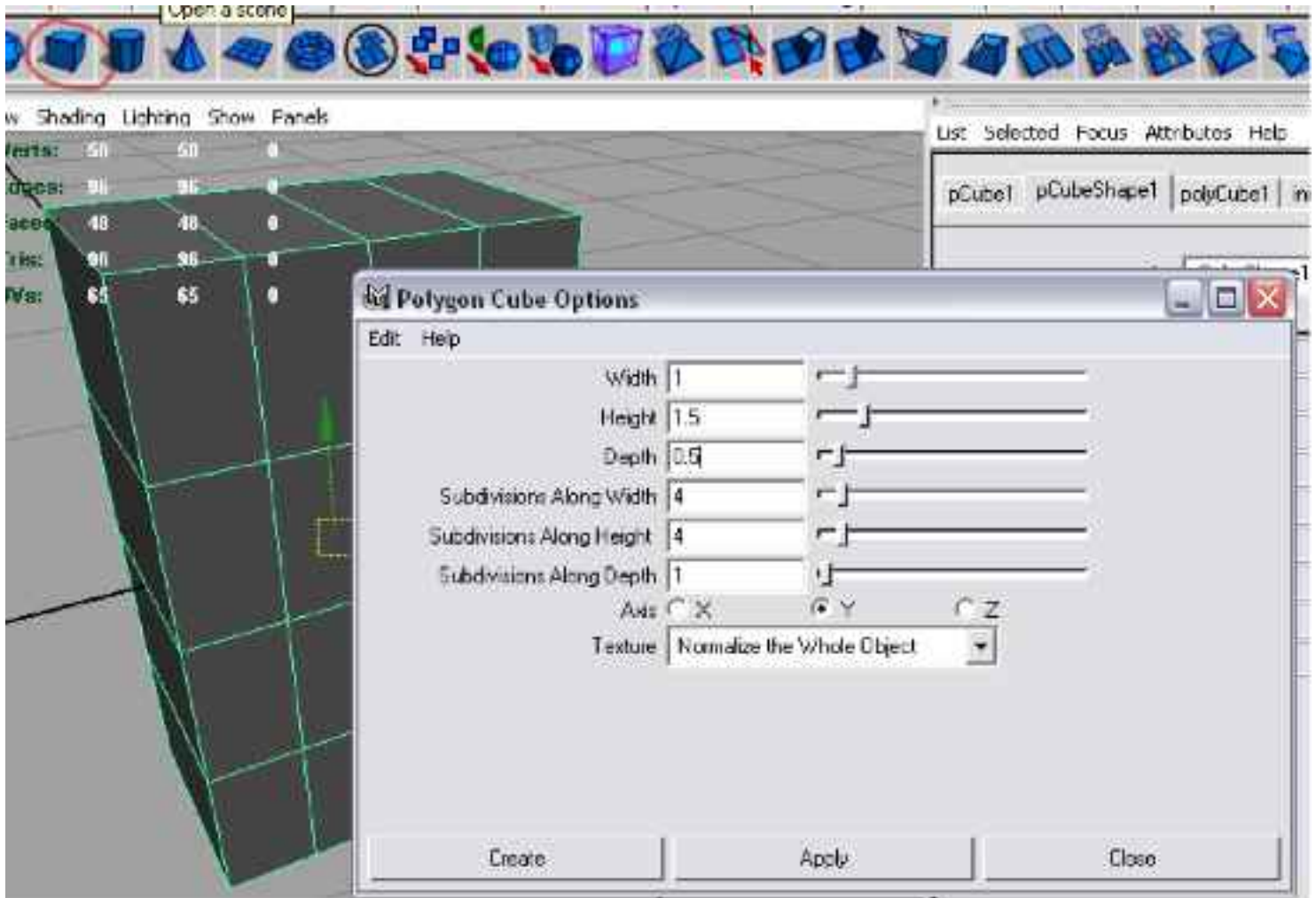
Go to Display on ur menu bar > heads Up Display > Poly Count and make sure its checked you should now see a list of things like verts, edges, tris, etc all with 0 pop up on the screen.

Now you are ready to start modeling.

-Modeling your Character

For this tutorial im gonna demonstrate modeling a simple character, in this case a female spartan but u may model anything you want.

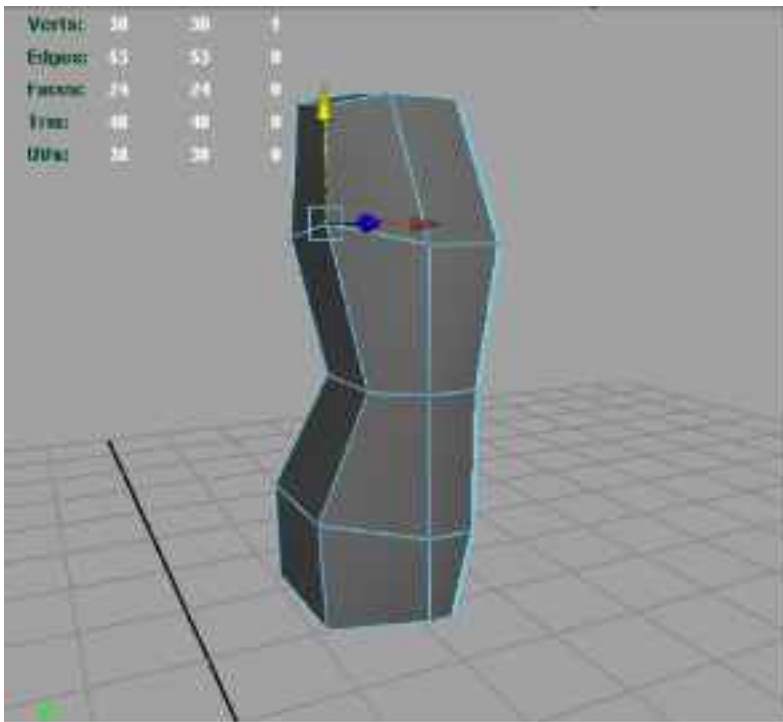
First I usually start by adding a polygon box and subdividing it into sections u can creat a box by clicking the box button



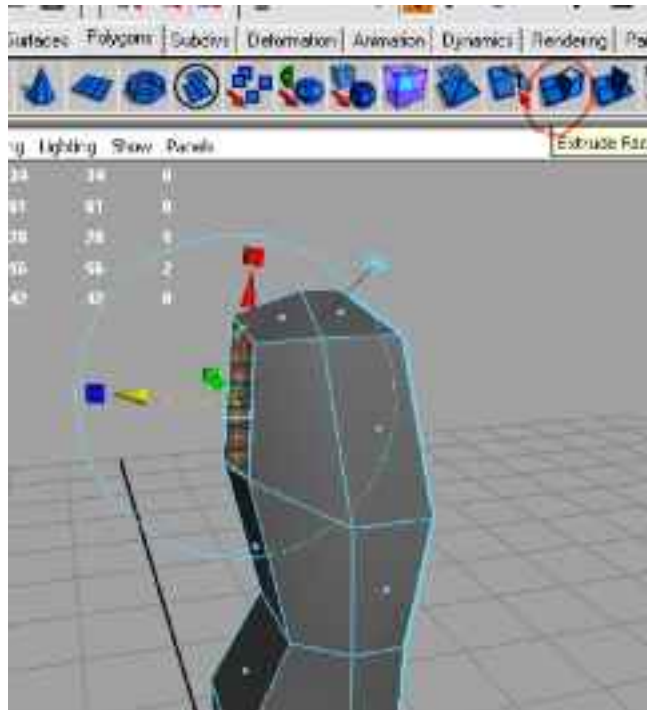
set the values to as what follows and click create, after double clicking it automatically creates a default box which u should delete.

now delete half of the polygons by right clicking the object and selecting faces, now select half of them on the positive X side and press the delete key now this will b the torso of or character.

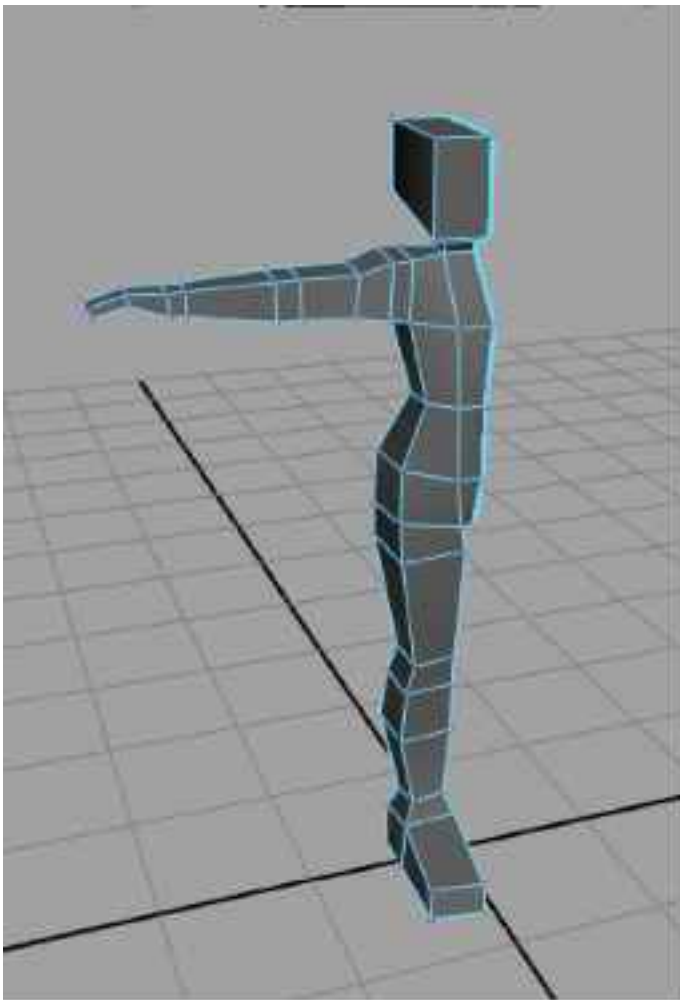
to get it to the right shape right click it and select vertex now u can select each vertex and adjust it to make a very simple shape of the half the body's torso. later we will add more detail and mirror it so mirror it and undo allot to make sure it looks porportionaly correct.



now you should be ready to extrude the faces to add limbs and a head.
right click the object and select faces, now select the faces near the shoulder and then click the face extrude button on the polygon tools panel.



a gizmo should pop up and move the error out wards to form shoulders, then repeat this step to build biceps then forarms and and last block for the hand
u can click the boxes to scale the size of the extruded surface to suit your model. Repeat these steps for the legs too. For head u are gonna wanna delete the faces on the other side cuz its gonna mirror andu want the end verts to join.
now ur model should look kinda like this



Now make sure u save every once in a while so u dont loose your data. incase of a crash now you are ready to start adding details.

but b4 that u may wanna do this, its very important for later on

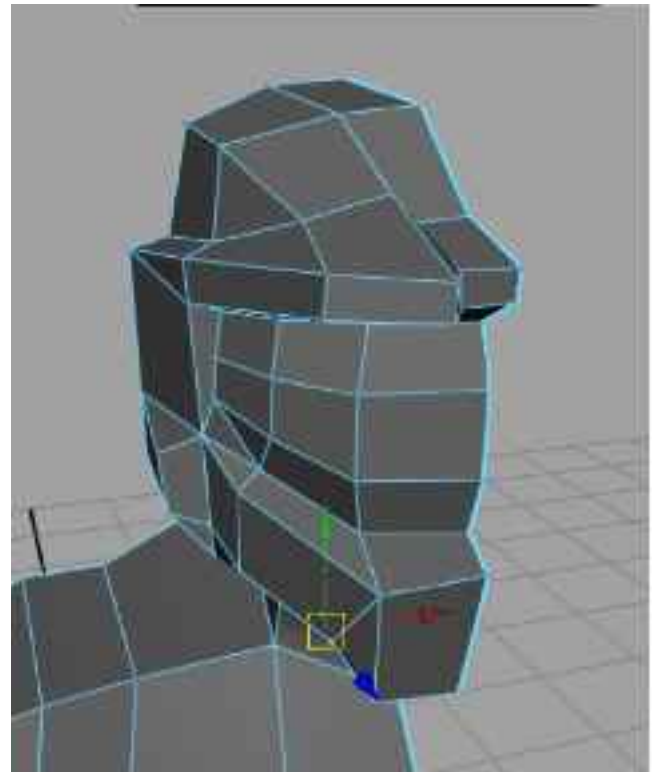
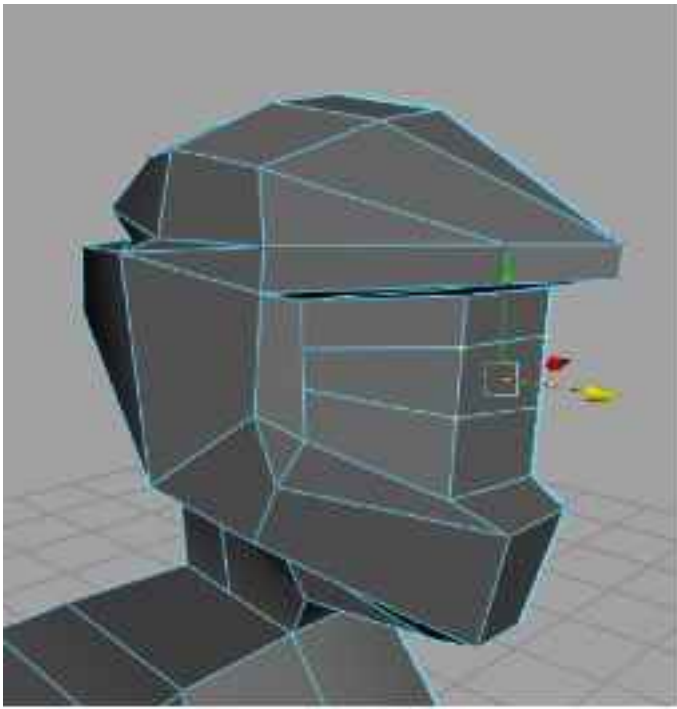
Go to the menu bar: Edit Polygon >Texture > Automatic mapping, the will take tons of time off future steps.

Now you are gonna add more polygons to move around to give ur object detail

to do this use the polygon split tool to draw where on the edges where u want the polygon to be divided.

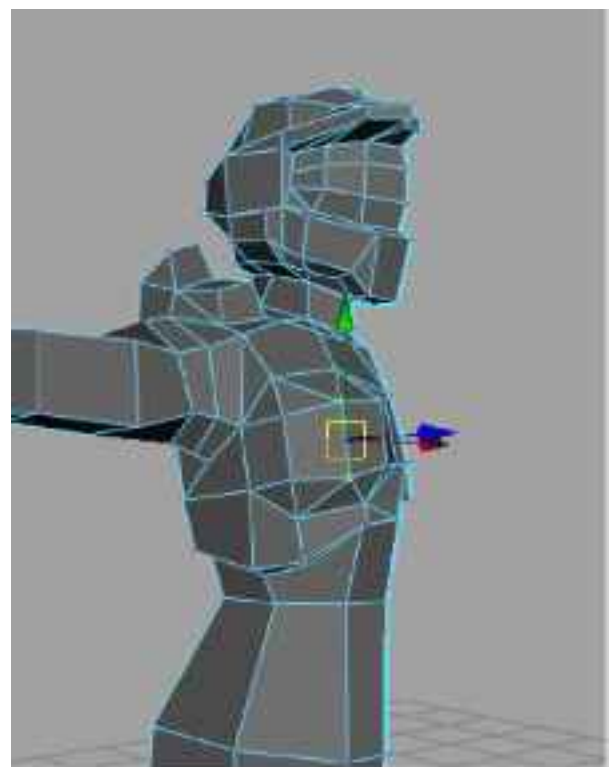
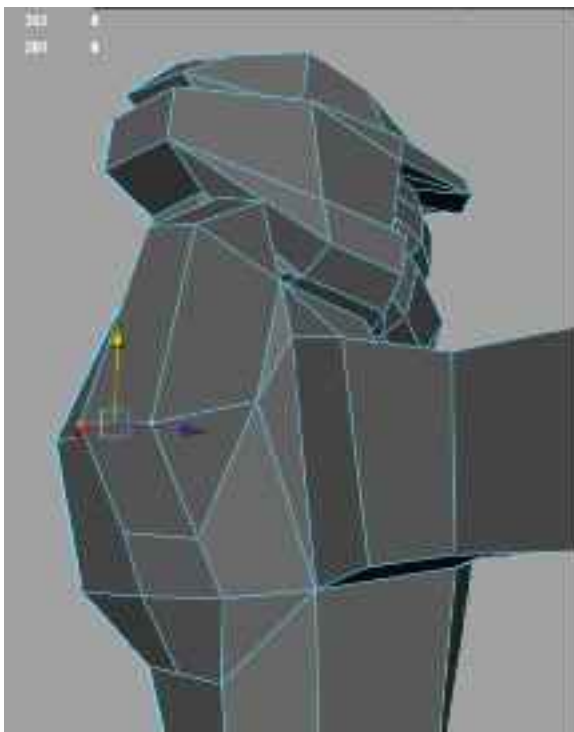


in this model we will start with the head by drawing an outline of the visor and helmet and adding more polygons to make the shape more smooth.U will use the move tool to move the verts to where ever to shape your modelthen add more and repeat until u have the desired form, remember u can select verts by right clicking and select vertex.

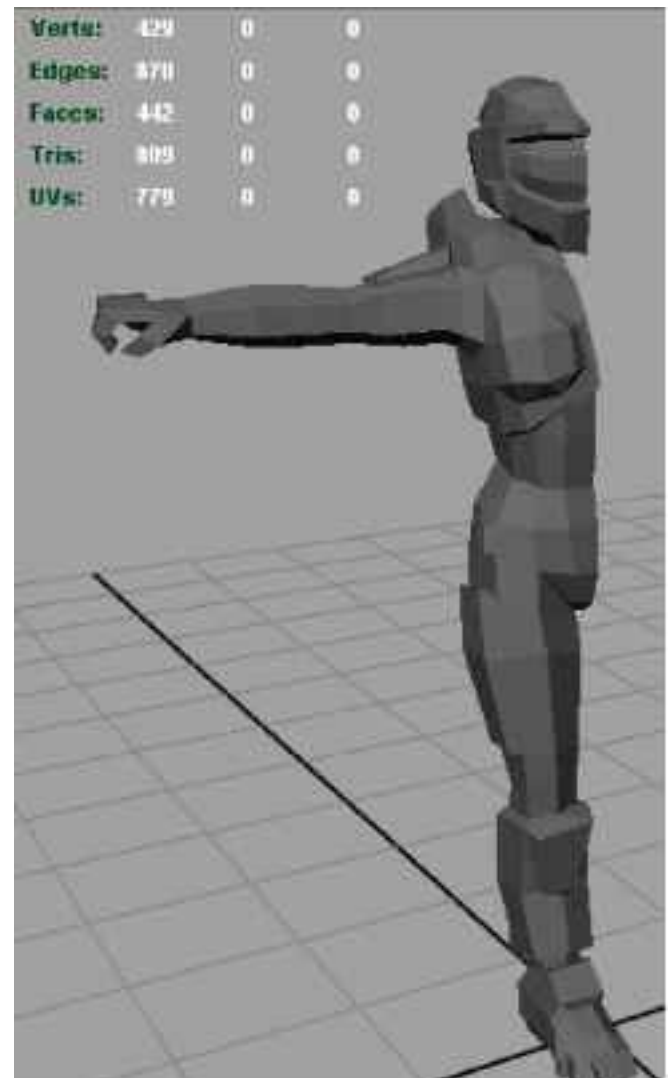
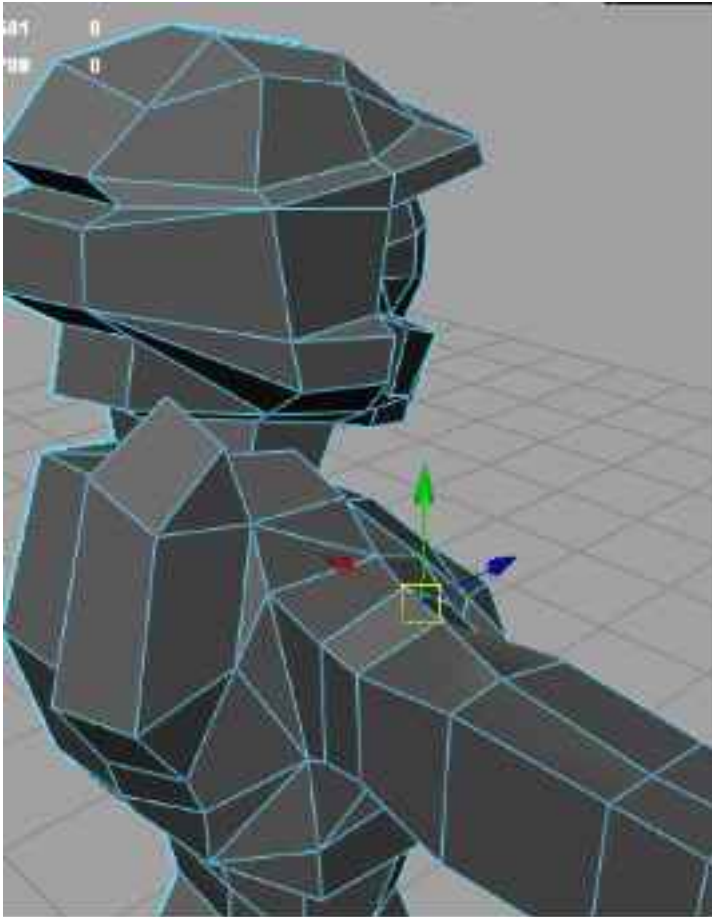


by now our head should start looking like the helmet our female spartan will where. once where satisfied with the head u can can move on to other parts of the body such as the breast plates, back pack and shoulders.

!!!Dont forget to save



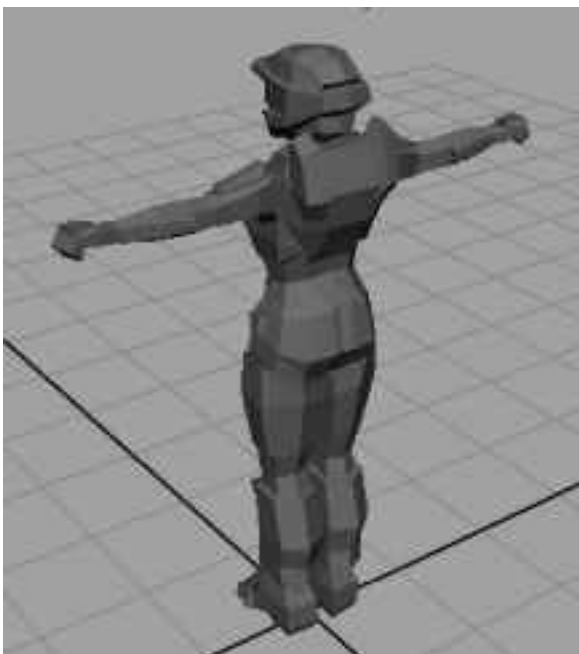
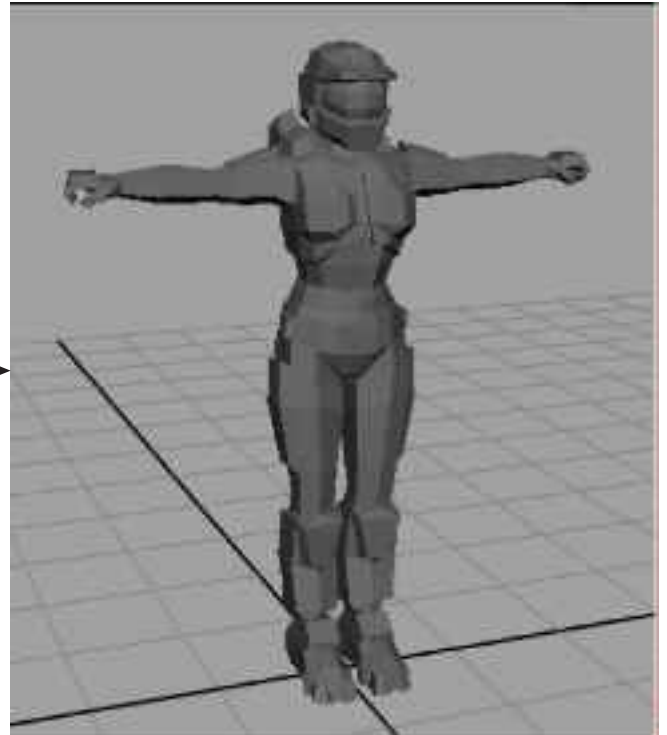
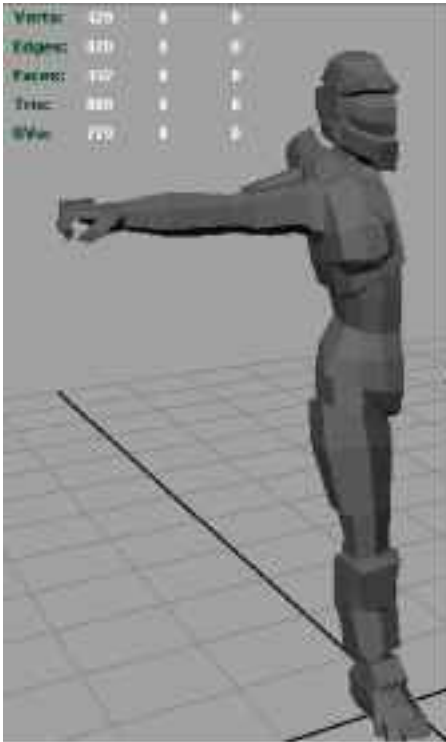
this will probably be the longest time u will spend on your model but make sure practice on less detailed models before attempting your final model. Next sculpt on your limbs and hands and feet using the same split and move, for the hands u will manna keep its a flat box for the 4 fingers and extrude the thumb seperate. since ur hands wont animate in 3rd person u dont need to worry about fingers. just model them in a gripping position so they look like there hold a gun or sumthing. also be sure to pay attention to how many tris (polygons) are being used u dont want your model to have too much or it may cause lag ingame right now she has about 809 tris. try not to go over 2000 cuz when u mirror it they double and when u got 16 players all with 4000 polys ur gonna have laggy gameplay, u can creat lod changing models (changes detail as u move farther away) but that process makes rigging 10x longer so stick with one low res poly for now.



Now that we are done with the modeling portion save, go for some snacks, maybe rest a bit, cuz u still got a long journey ahead of you. the next step is UV mapping (for those noobs out there it means taking your model's polygons and laying them all out flat so that you can paint a texture on them.) this is the next longest process next to modeling. Also the less polygons u have the easier this is. dont forget to mirror to check it and undo using the mirror tool



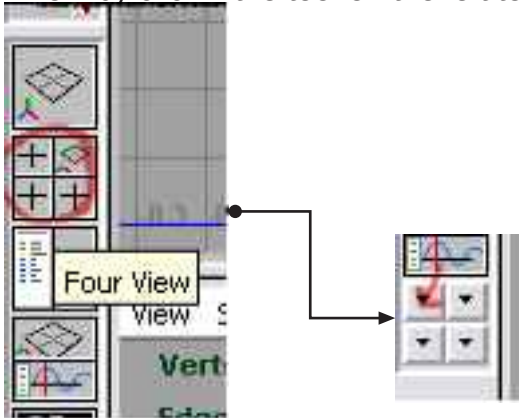
this will give u an idea of how it should look.



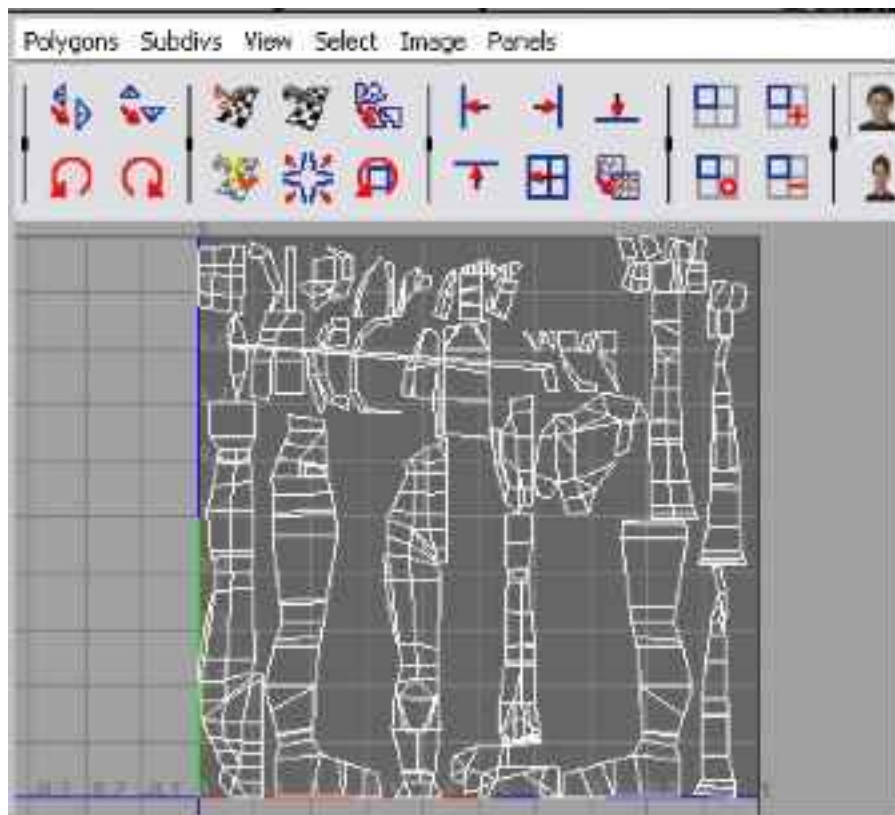
after, undo the mirror and save.

-UV Mapping

Now we are going to flatten your models polygon in a separate view so that a texture can be applied to it. That window is called the UV map editor. It can be opened by switching the view to 4 way split view by clicking the tool on the left tool bar that looks like this

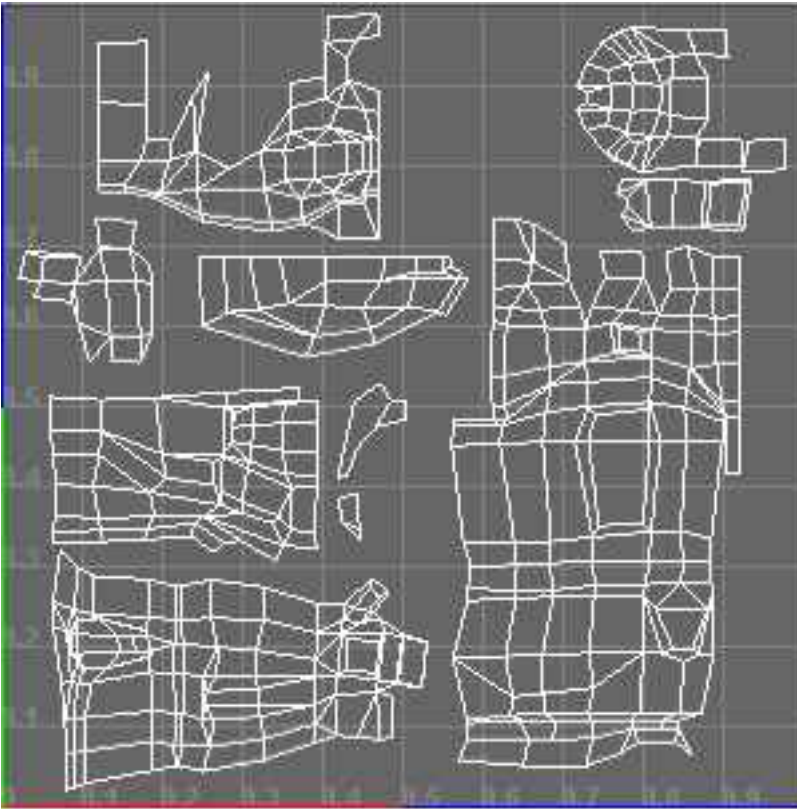


then at the bottom of that tool bar click and hold at the icon of the view and select UV Texture Editor now one of your view should look like this if you followed that step I mentioned earlier when you did the automatic mapping



here you will see your model's polygons nicely arranged. By right-clicking and selecting UV, you can move around these points. Under the Polygons menu bar in this little window, you can perform operations like sewing them together or cutting them apart. The main purpose of this step is to get them as neatly arranged as possible without having to break them up into more parts. This can take hours for high-polygon models though, so take your time and do it carefully. If you cannot tell which UV is where on the model, just select it and look in the 3D view for a green highlighted vertex. You can also do this vice versa. Make sure they are arranged so the polygons are as little warped as possible. You can also use the planar map tool by selecting which polygon faces you want to project onto the UV map in the 3D view. To do so, go to Edit Polygons > Texture > Planar mapping and rotate and scale the gizmo to see how it affects the UV map.

now that they are all organised they should look kinda like this



now u can export that as a bmp and use it a painting app like photoshop or gimp shop to give it a texture. that u can apply to the object. to do this go to polygons under the UV map menu and select UV snapshot this will save the uv layout as a image for u to use.

now save your work and then mirror your model now your are just about done with your model also u may want to deleta all of the model's construction history by selecting it an going to Edit > Delete by Tyle > History this releave allot of stress on your memeory and allow you to continue working on it with no lag. now that ur model is mirrored u may wanna mergve the verts where they join at by using the merg vertex tool. just select the verts in the middel and click

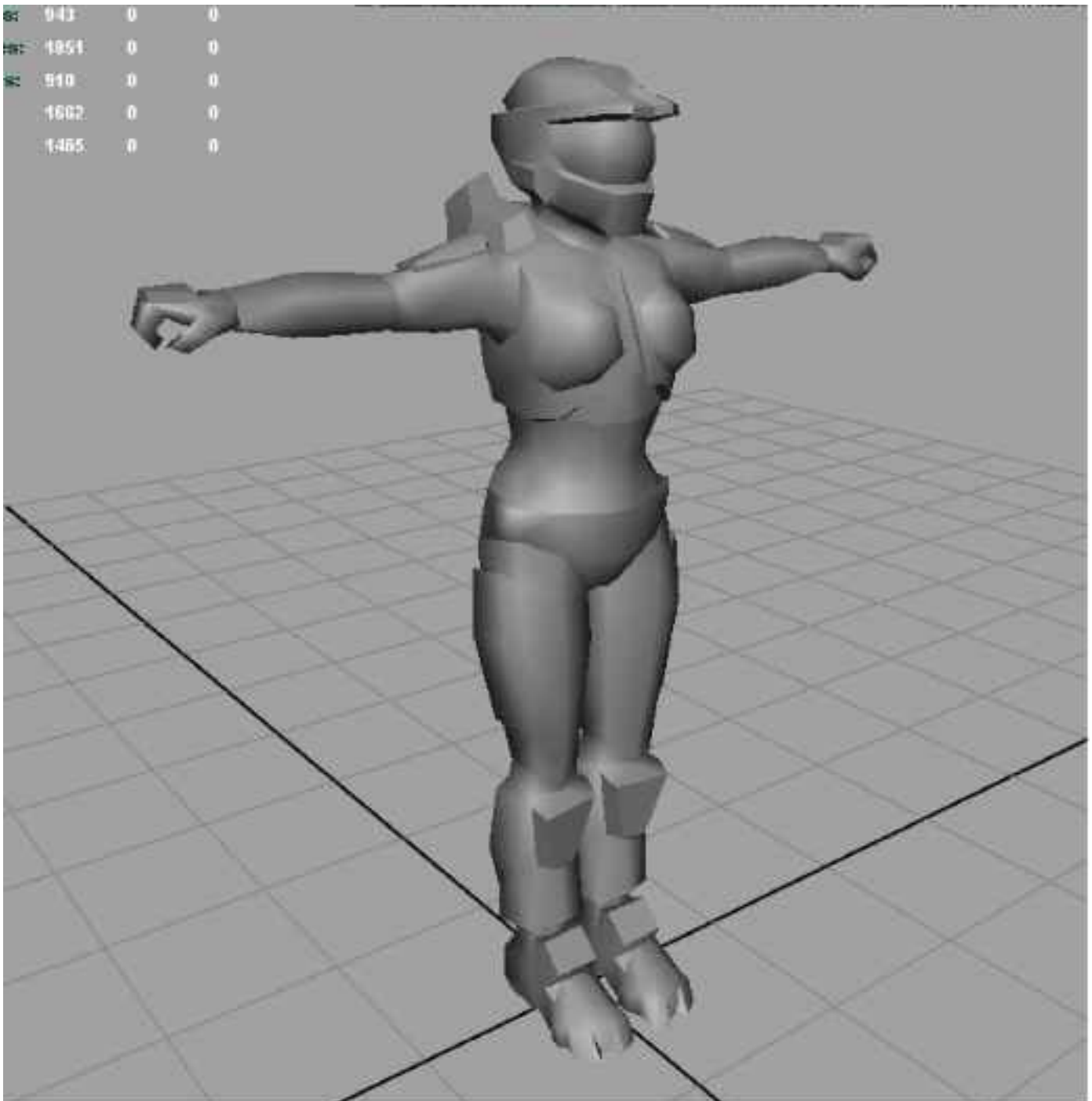


now to move on the next step, dont forget to save!!!!

-Model Smoothing

this step is to now show u how to smoothen the geometry so the edges are not so hard and flat like they appear now. To do so select by faces either in 3d or uv mapping view and select the faces which you would like to smoothen such as the visor then go to edit polygons > Normals > Soften/harden when it applies u should see it in the attributes panel on the right side of the screen, if that panel is not there press Ctrl + A to display it. there you should see the soften/harden tab where u can edit the degree which faces get smoothed. do this for all of the faces you want to be smooth or hardened once finished and u have ur model textured and finalized it your are ready for export. make sure that when ur done your are done with the modeling cuz once u start rigging u cannot go back.

Now after smoothing out all your polygons your model should be nice and smooth instead of all choppy and jagged and should now be something like this



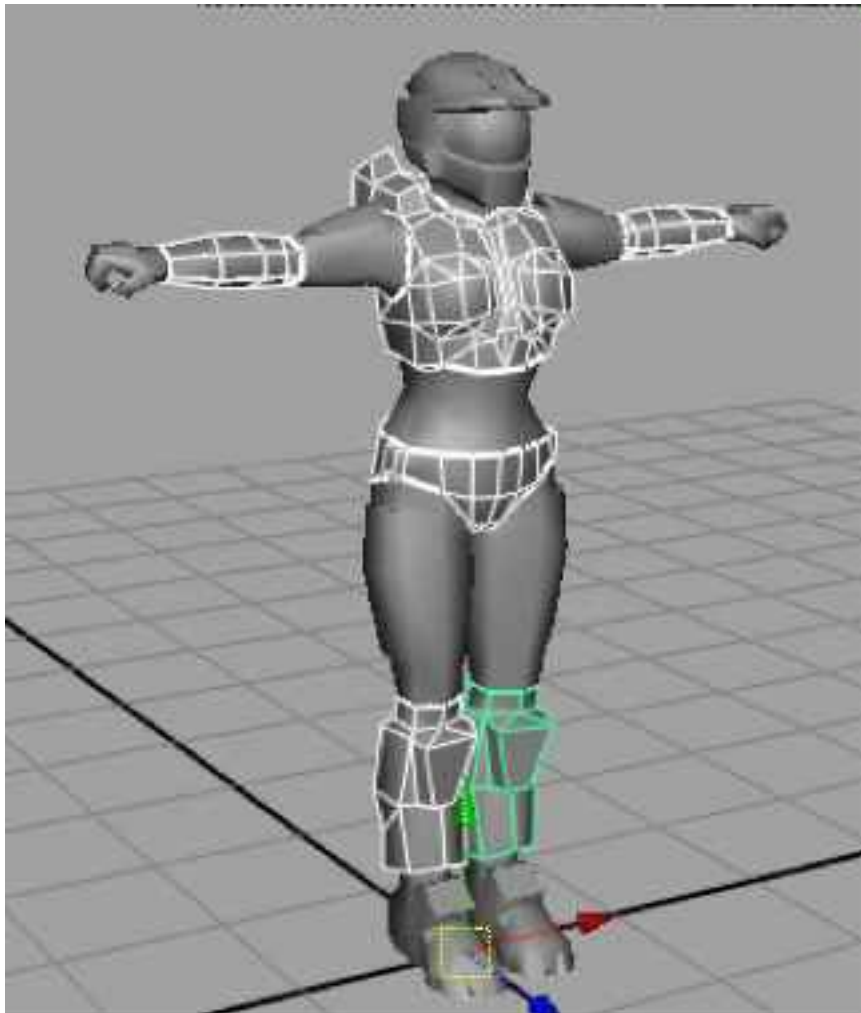
next we are going to select by edges (right click) and select all the edges around the body's joints and use the split vertex command (edit polygons >split vertex) on the menu bar to separate our model into several different parts that we can use to bind to bone later on. this will allow us to get the model ingame instantly to check texture mapping and shaders and also to check if the model is scaled properly. after splitting them use the



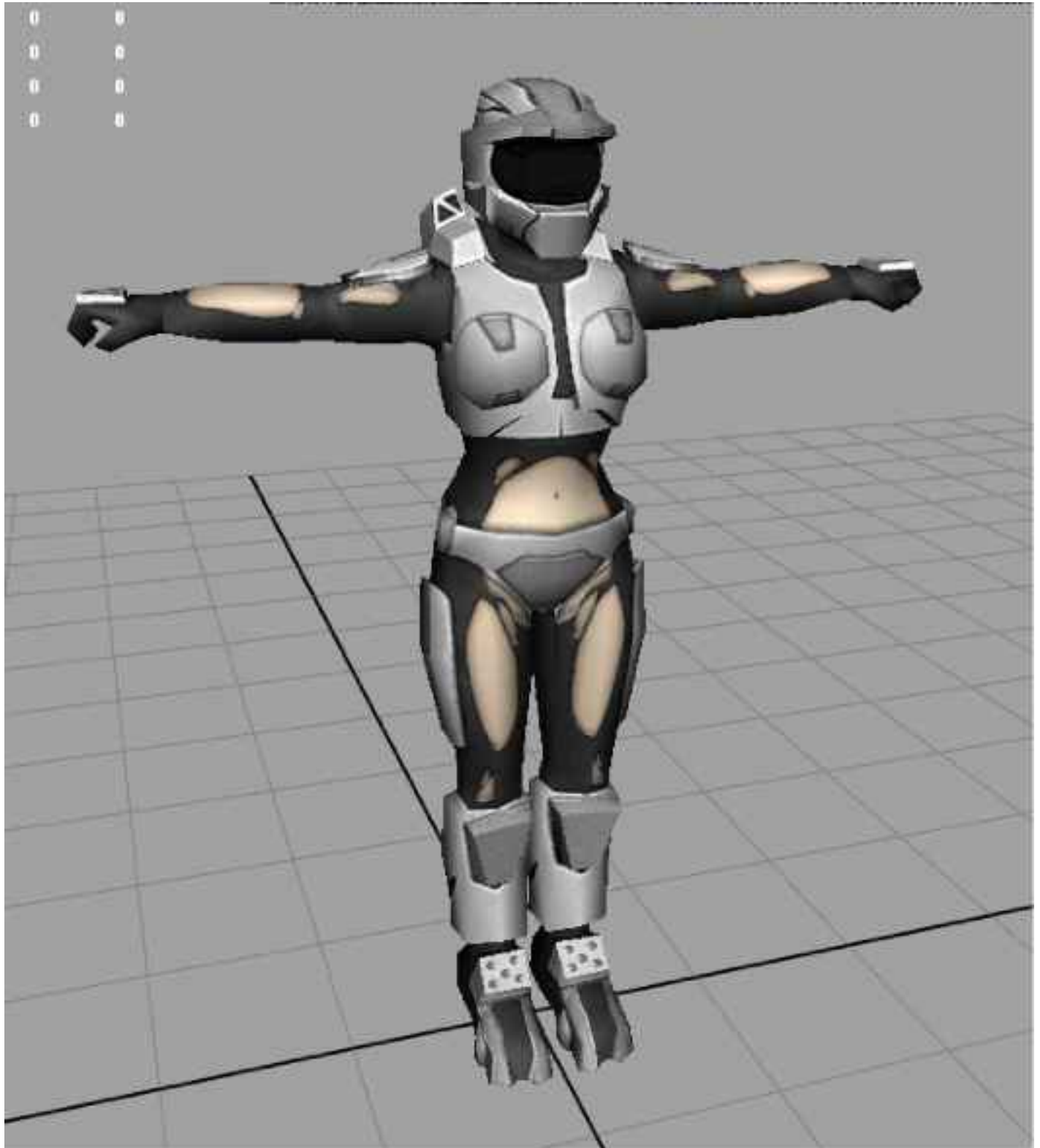
tool to separate them into different objects. then on each one use the



tool so sew back together the edges left open, u also may want to smooth these edges too since they will be hardend after splitting and sewing. now the limbs should be seperate and should look like this.



Now you can apply the textures to see how it would look, makesure when you do the multipurpose map that the armor color in the alpha channel is white so that it changes color while ingame.





here we applied a simple texturemap feel free to be as creative as you want in your thought.

now we can export and finish begin simple rigging in 3ds Max. Simply go to File>Export all and select the Obj file format. Make sure that u have the Obj Import pluggin installed in 3ds Max or else we cant open this in 3ds Max.

Now You are complete with the modeling tutorial, brace yourselves for we still have allot to do in the next step Character Rigging.