

Monday, February 22, 2010  
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Kung Fu Panda full building  
Website

- <http://www.escalight.com/tutorials/3dsmax-tutorials/kung-fu-panda-modeling-part-1.html>
- <http://www.escalight.com/tutorials/3dsmax-tutorials/kung-fu-panda-texturing-part-1.html>
- <http://www.escalight.com/tutorials/3dsmax-tutorials/kung-fu-panda-skinning-and-rigging-part-1.html>
- <http://www.escalight.com/tutorials/3dsmax-tutorials/kung-fu-panda-animation.html>



Kung Fu Panda Modeling (1.1)

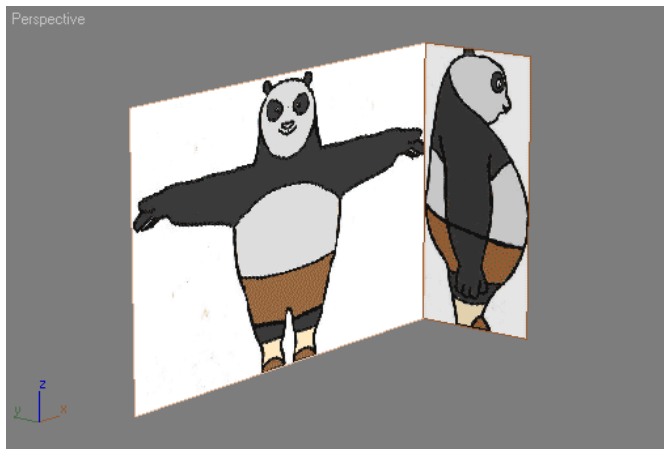
Have you seen [Kung Fu Panda The Movie \(2008\)](#)? It's the story about a lazy, irreverent slacker panda, named Po, who is the biggest fan of Kung Fu around. But unwittingly Po becomes the chosen one when enemies threaten the village he lived in. In this tutorial you will learn to create Po model, [low poly model version](#). Don't compare the model you will create with the real one you saw in movie. I simplified many things. But at least you'll understand how to create one. I planned to create Po character from [modeling](#), [texturing](#), [rigging and skinning](#), also [animate](#) him. So let's prepare for the first one: modeling.



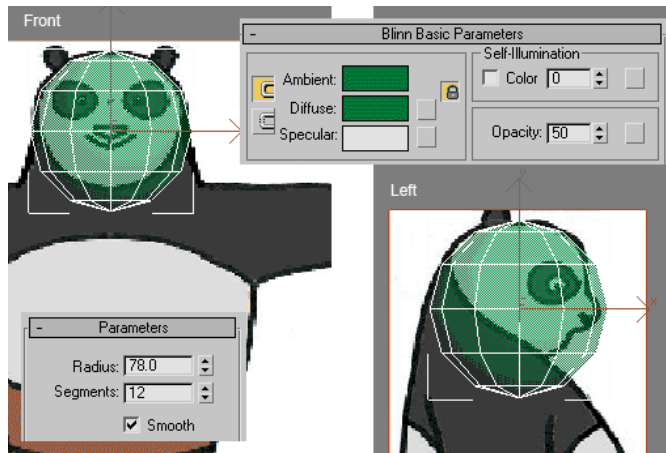
Kung Fu Panda The Movie. I really love this movie.

1. First, we need a reference image. Too bad, I can't find any reference image I want in the net. So, I decide to draw myself. Look at image below, I prepared a blueprint for you, complete with Po drawing (left and side image). How to create blueprint like this, read previous tutorial [Modeling Using Blueprint](#).

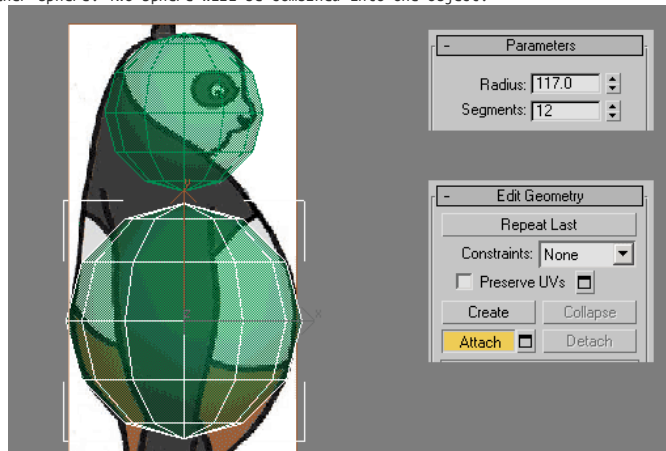
You can [download 3dsmax file with blueprint here \(3dsmax ver 8\)](#).  
Also you need to [download bitmap images for blueprint](#)



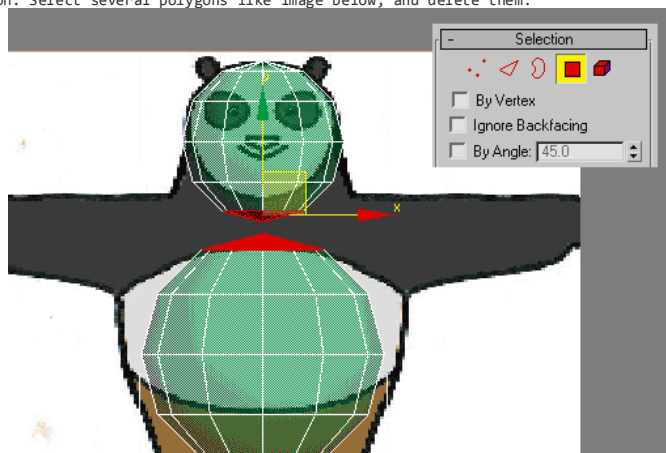
2. Start by creating a sphere in Top viewport. Use Radius=78 and Segments=12. Position this sphere at Po head (look at image below). Apply material to this sphere. Use Opacity=50% so you can see blueprint behind. You can use any color you want. Later, you can change Opacity value at any time to help you in modeling.



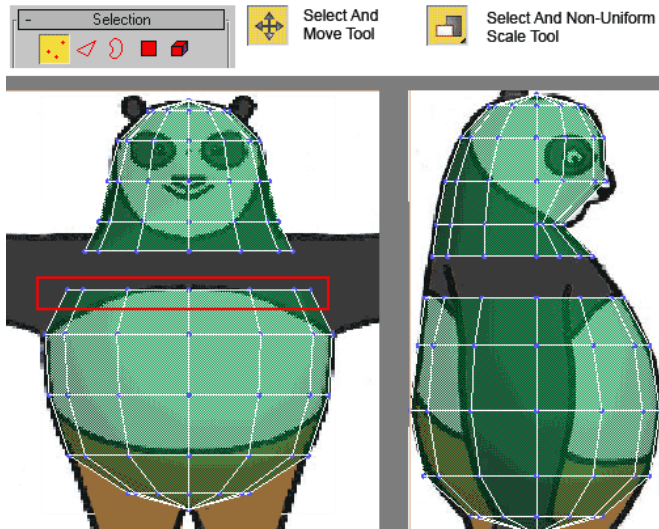
3. In Left or Front viewport, move sphere down while holding Shift. You will get sphere clone. Use Copy for cloning method. In Command Panel, go to Modify tab, increase cloned sphere radius to 117. Place this cloned sphere in Po's belly. Select one sphere—any sphere you want—then right click and choose Convert to>Convert to Editable Poly. Next, go to Modify tab, in Edit Geometry rollout, click **Attach** button and click another sphere. Two sphere will be combined into one object.



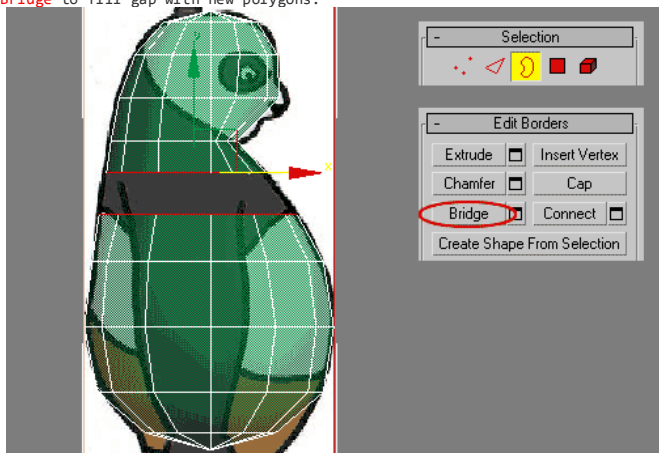
4. Activate Polygon selection. Select several polygons like image below, and delete them.



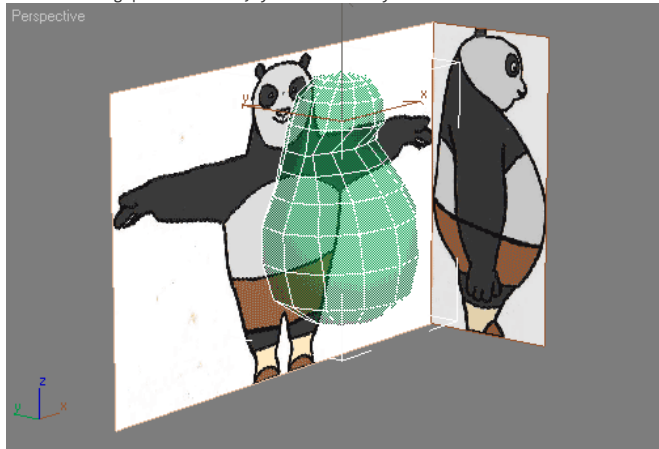
5. Change to **Vertex** selection. In Front and Left viewport, move vertices position. Tips: In Front viewport, you can select a loop of vertices and scale them along horizontal axis using Select and Non-Uniform Scale tool. Use image below for reference.



6. Now, choose Border selection. Select two borders like image below. To select more than one border, hold Ctrl while selecting. In Edit Borders rollout, click **Bridge** to fill gap with new polygons.



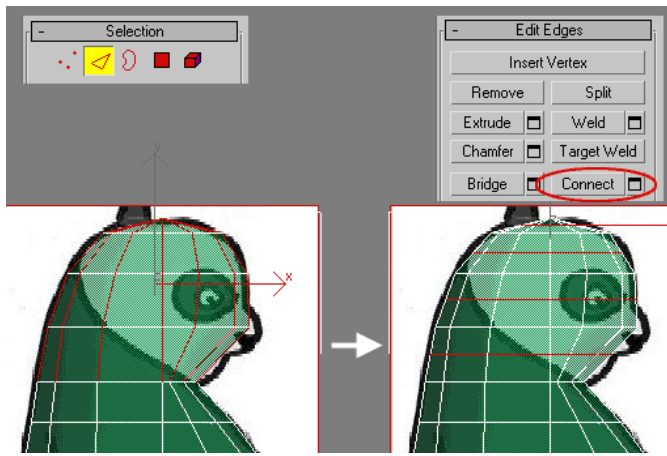
7. This conclude first part of Po modeling process. Next, you will modify head area.



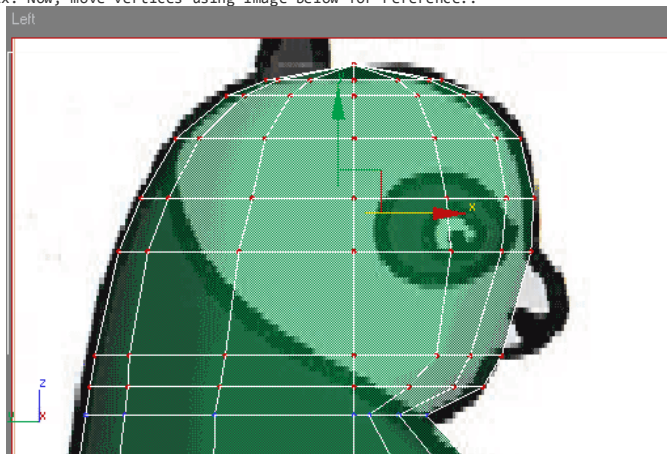
#### Kung Fu Panda Modeling (1.2)

In Part 1 tutorial, you have created Po's basic body shape. Next, you will modify Po's head to create eyes, ears, and nose. You will use several tools like Bevel, Extrude, Connect, and many more. Let's begin this tutorial section.

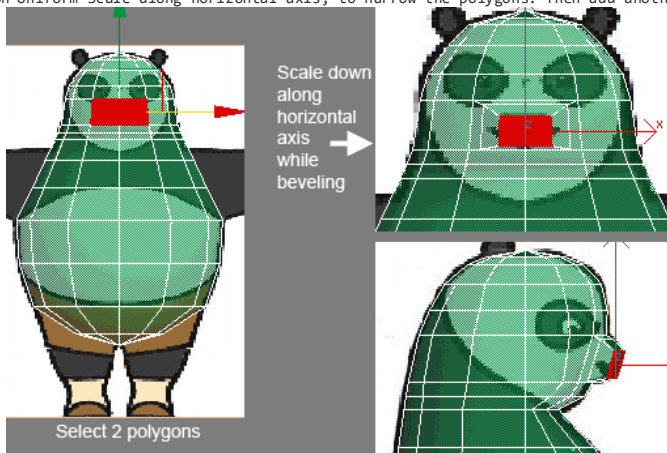
1. Continue previous tutorial. Activate **Edge** selection. In Left viewport, select all vertical edges in head area (look at image below). Then, in Edit Edges rollout, click Connect. Those edges will be divided.



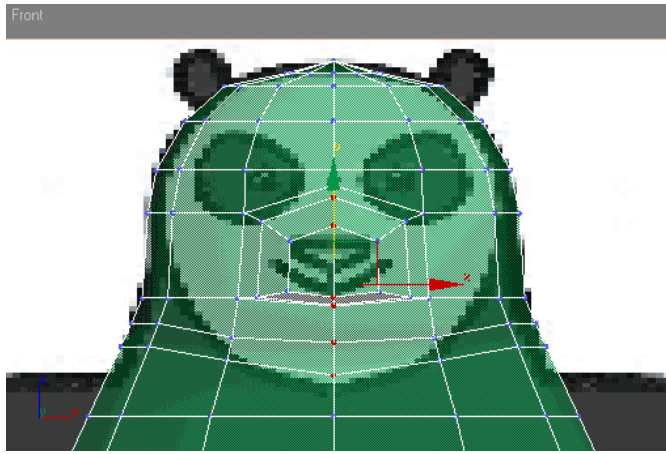
2. Change selection to Vertex. Now, move vertices using image below for reference..



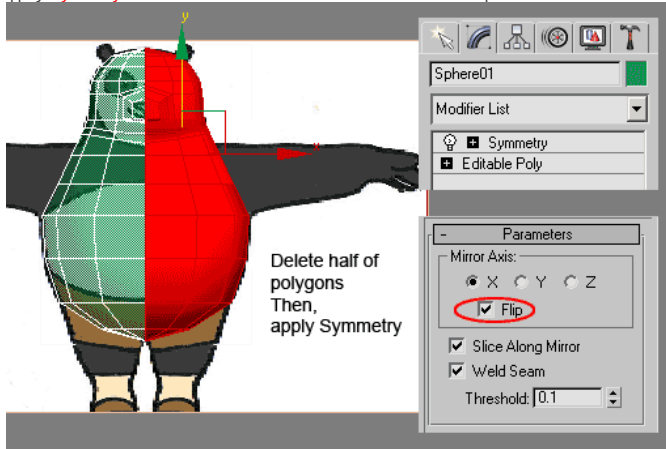
3. Let's move on. We are going to create a nose. Select two polygons in nose area. Hold Ctrl while selecting to select more than one polygons. In **Edit Polygons** rollout, click **Bevel**. Click and drag in viewport, to add slight Bevel to these polygons. Then, scale polygons using Select And Non-Uniform Scale along horizontal axis, to narrow the polygons. Then add another bevel..



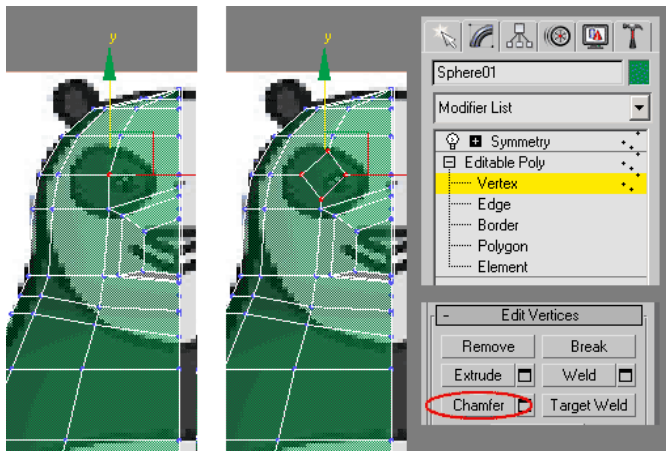
4. Next, select several vertices in nose area (look at image below, make sure vertices in the back are not selected), and move them up and down to create better nose shape.



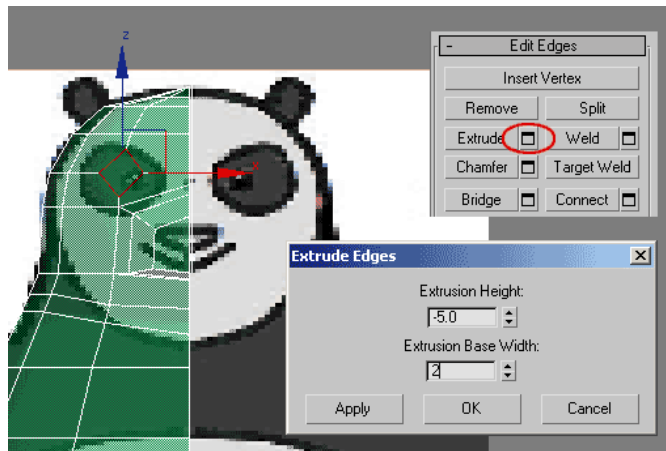
5. Activate **Polygon** selection. In Front viewport, select half of object (right side). Then, delete those polygons. De-activate all sub-object selection. Next, apply **Symmetry** modifier. Make sure Mirror Axis=X and Flip is active.



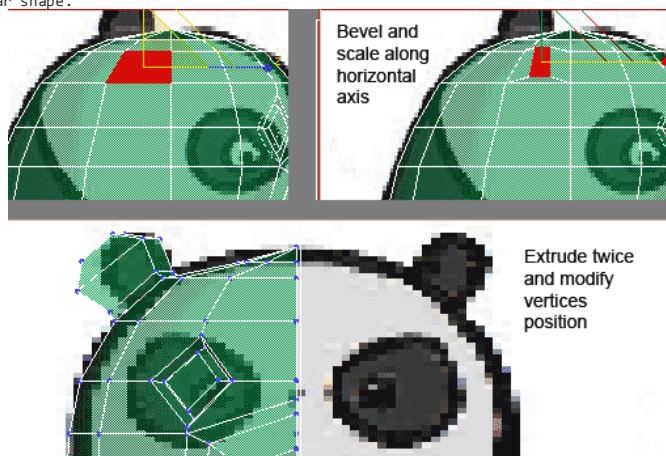
6. Let's continue by creating eyes. In Modifier Stack, click plus (+) sign left of Editable Poly row, then highlight Vertex selection. In Front viewport, select one vertex in eye area. Then in Edit Vertices rollout, click Chamfer button. Click and drag in viewport to chamfer vertex..



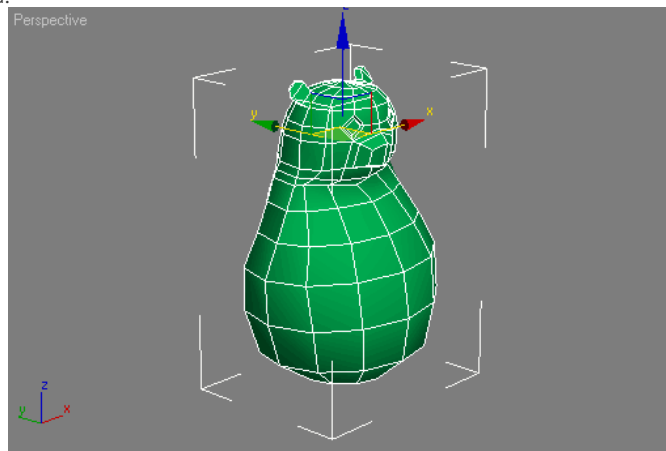
7. Change to Edge selection. Select four edges from chamfering result. Then, in Edit Edges rollout, click Settings button right next to **Extrude**. A small dialog box will open. Enter Extrusion Height = -5 and Extrusion Base Width = 2. Click OK.



8. Next, we are going to create an ear. Change to **Polygon** selection. In Left viewport, select one polygon like image below. Add **bevel** to this polygon. Then, using **Select and Non-Uniform Scale** decrease polygon width. Next step, **extrude** this polygon twice. Modify vertices position to make ear **shape**.



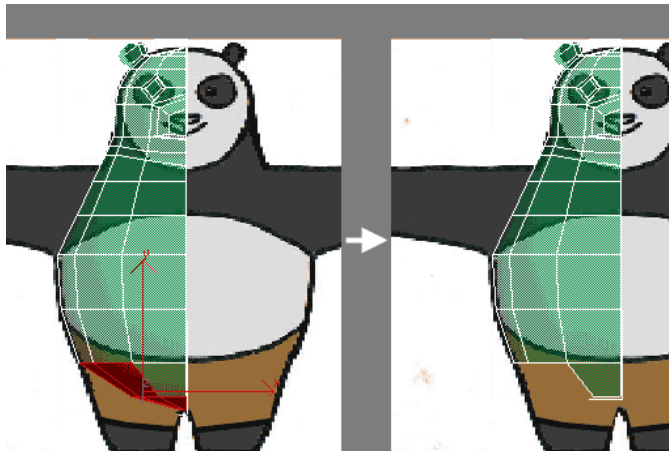
9. Po's head is now finished.



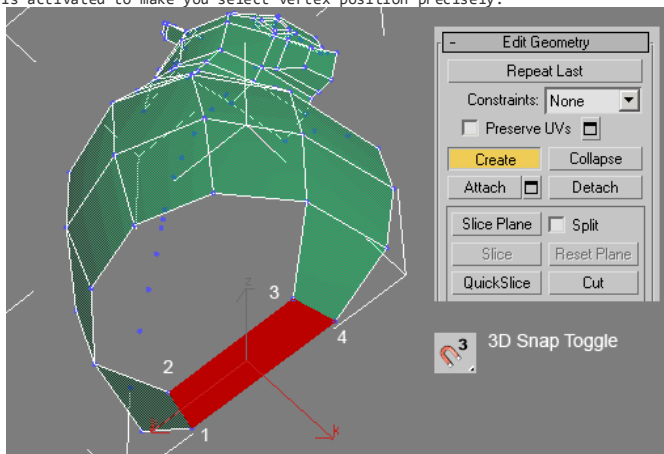
#### Kung Fu Panda Modeling (1.3)

Phew, in Part 1 tutorial, you have create basic body shape, and in Part 2 tutorial you successfully modify Po's head. Now, it's time to create Po's leg. You know, Po's leg is relatively smaller than original panda's. Moreover, if you compared to his belly.

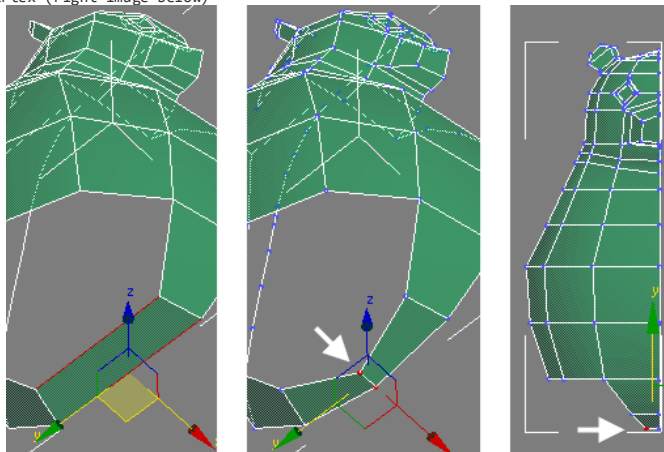
1. Begin by selecting several polygons in Front viewport (look at image below). Delete them.



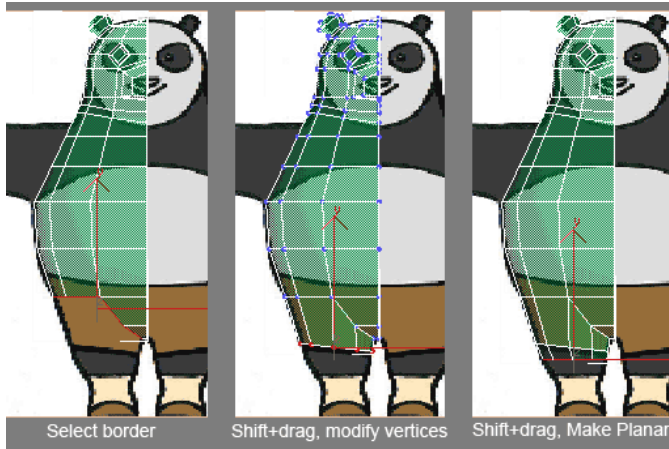
2. In Perspective viewport, rotate view until you can see bottom part of Po's model. Make sure you are still in Polygon selection. Activate **3D Snap Toggle**. Then, in **Edit Geometry** rollout, click **Create** button. Click four times in order (1-4) in viewport to create new polygon. 3D Snap Toggle is activated to make you select vertex position precisely.



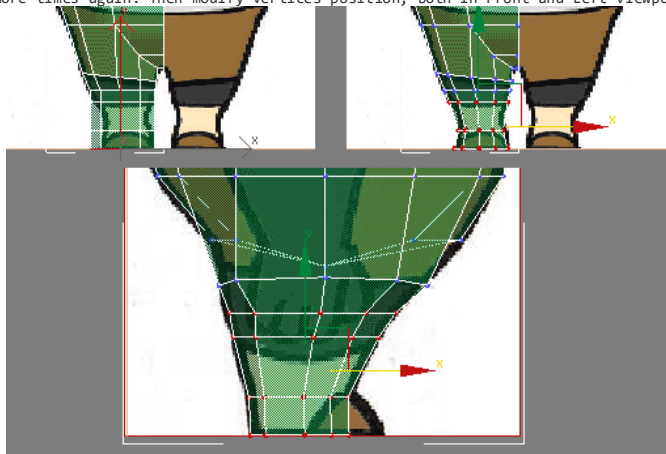
3. Change to Edge selection. Select two edges in newly created polygon (look at image below). Then use **Connect** to create new edge. Change selection to Vertex. Select vertices in newly created edge. In Front viewport, move them down. Then select one vertex only, and move it closer to another vertex (right image below)



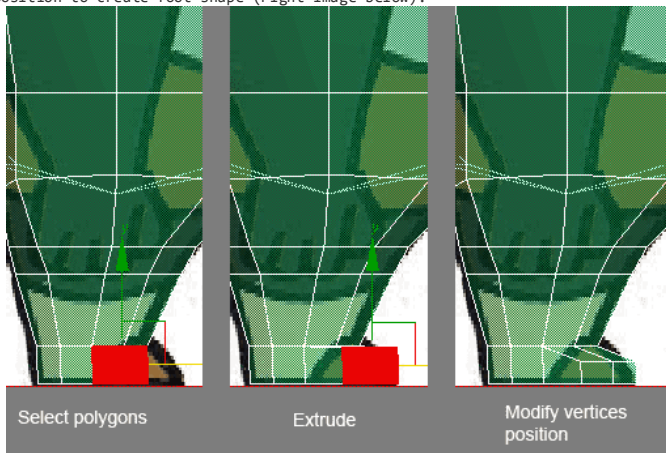
4. Activate **Border** selection. Select border in leg area (look at left image below). Move border while holding **Shift** button in keyboard. Position vertices using blueprint as reference (look at middle image below). Select border again and Shift+drag to create more polygons for leg. This time, in **Edit Geometry** rollout, click **Make Planar: Z** button. The result is like right image below.



5. Shift+drag border three more times again. Then modify vertices position, both in Front and Left viewport.

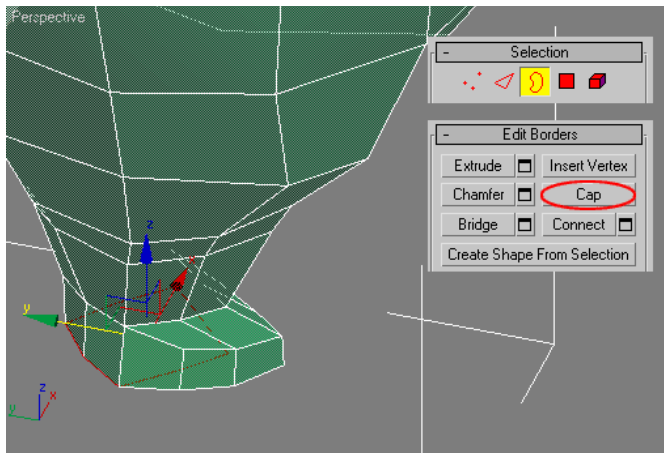


6. Let's continue to create foot. In Left viewport, select several polygons (left image below). Extrude them. Change to Vertex selection. Modify vertices position to create foot shape (right image below).

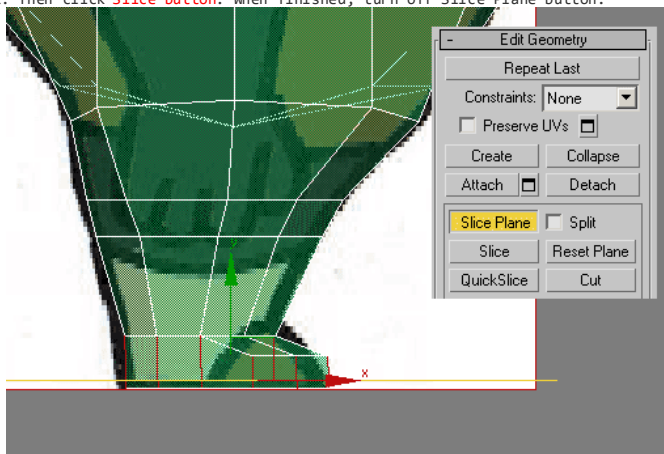


7. Next, change to **Border** selection. Select one border in the bottom of foot. Then, in Edit Borders rollout, click **Cap** button, to fill the hole with polygon..

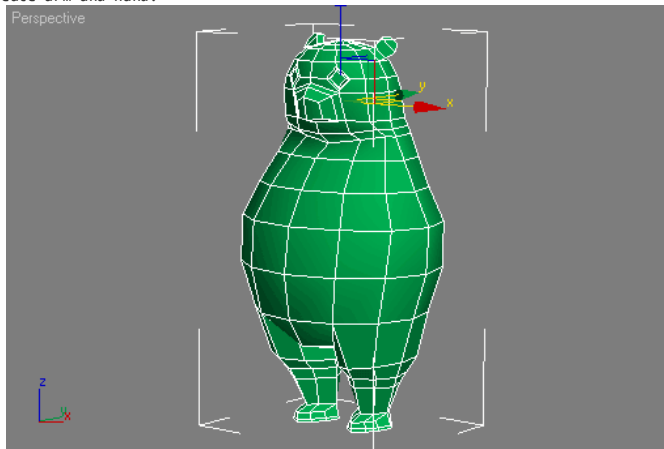




8. To finish modeling the foot, we need one more step. Activate **Edge selection**. Select all vertical edges in the bottom area of foot. In **Edit Geometry rollout**, click **Slice Plane** button. Slice plane will appear in viewport (yellow rectangle). Move slice plane down at the most bottom part of foot. Then click **Slice** button. When finished, turn off Slice Plane button.



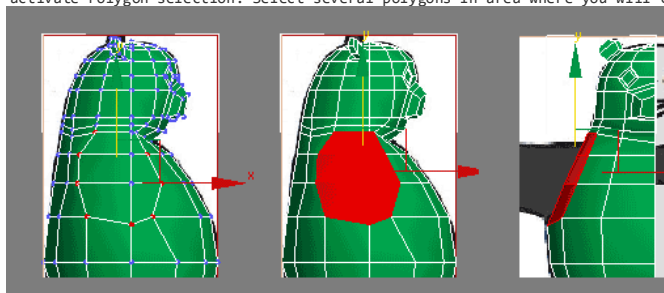
9. Next, you are going to create arm and hand.



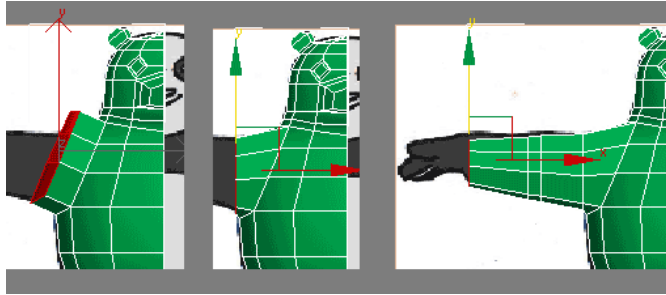
#### Kung Fu Panda Modeling (1.4)

We have created basic body shape (Part 1), modeling a head (Part 2), and adding legs (Part 3). Now, we are going to create arm and hand.

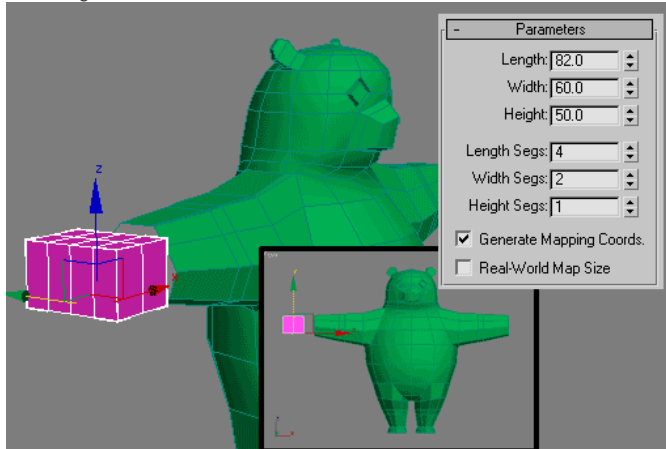
1. Continue your previous lesson. In Left viewport, modify several vertices position (left image below). We need to do that before creating arm. When finished, activate Polygon selection. Select several polygons in area where you will create an arm.



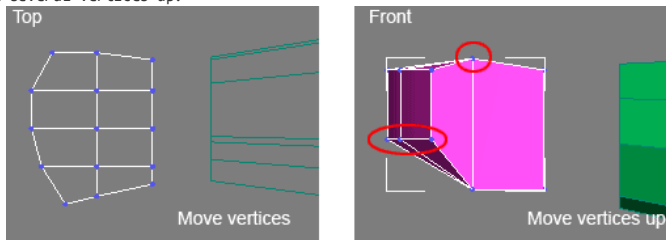
2. Apply **Extrude** to this polygons. In **Edit Geometry** rollout, click **Make Planar: X**. Adjust size of polygons using **Select** and **Uniform Scale**. In **Front** viewport, move polygons if necessary to fit blueprint behind. Next, apply **Extrude** three more times again. You also need to position and scale polygons. When finished, don't deselect polygons but delete them. Finally de-activate all sub-object selection.



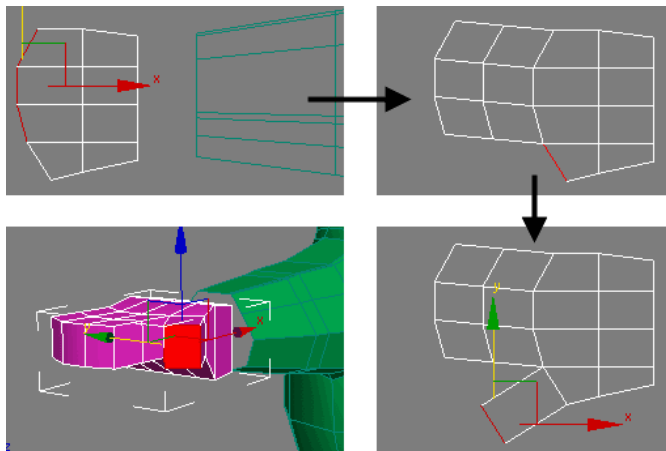
3. To create a hand, we are going to create from a box. Later, we will attach this hand object to Po model. Start by creating **Box** in **Top** viewport. Use parameters like image below. Move this box close to Po's arm.



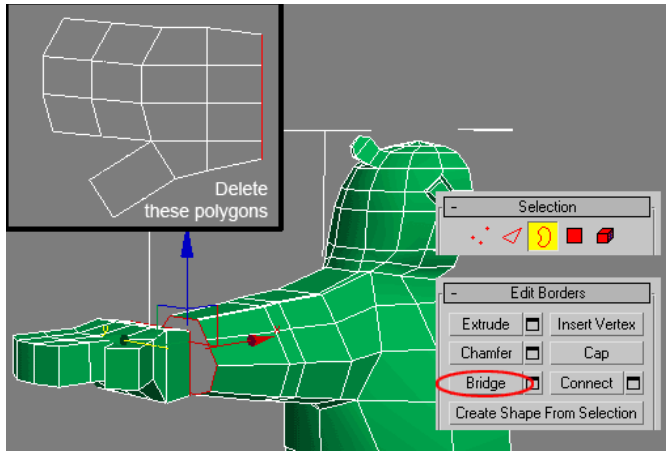
4. Convert box into **Editable Poly**. Adjust several vertices position. Start from **Top** viewport. Use left image below for reference. Next, in **Front** viewport move several vertices up.



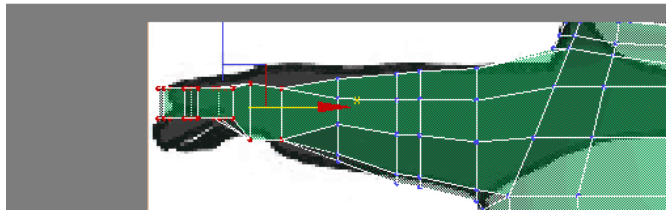
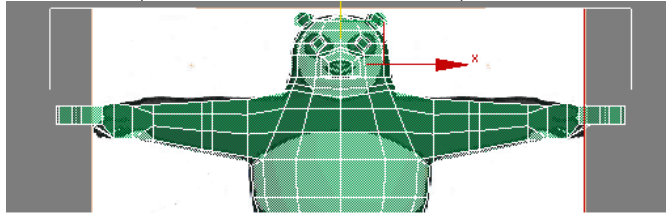
5. Activate **Polygon selection**. Select three polygons in hand object. Extrude twice to create fingers. Then, select one polygon, and extrude to create thumb.



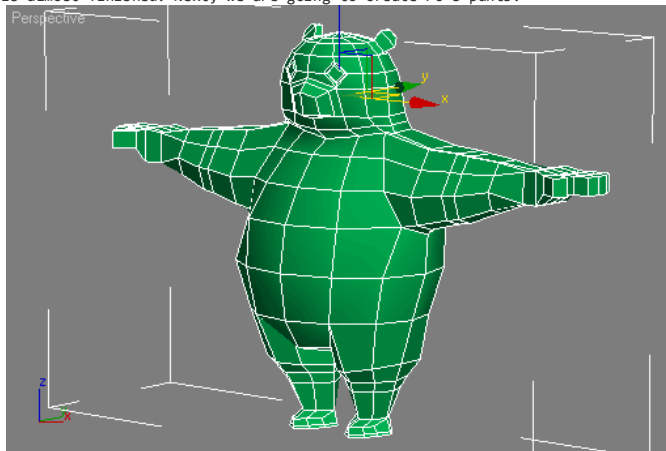
6. Select, 4 polygons in the wrist area of hand object. Delete them. De-activate all sub-object selection. Now, select **Po model** object. Go to **Modify** tab. Highlight **Editable Poly** row in **Modifier Stack**. In **Edit Geometry** rollout, click **Attach** button, then click hand object in viewport. After this, activate **Border selection**. Select two borders between hand and arm. In **Edit Borders** rollout, click **Bridge** to connect hand and arm.



7. In Front viewport, compare model and blueprint. Fit arm and hand based on blueprint behind. You can scale or move vertices..



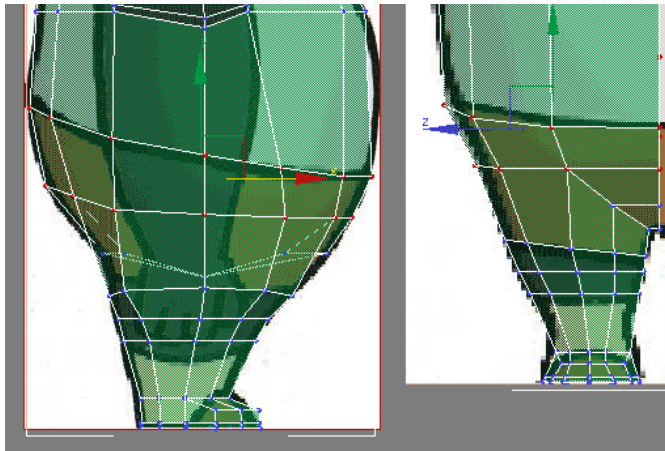
8. Your Kung Fu Panda model is almost finished. Next, we are going to create Po's pants.



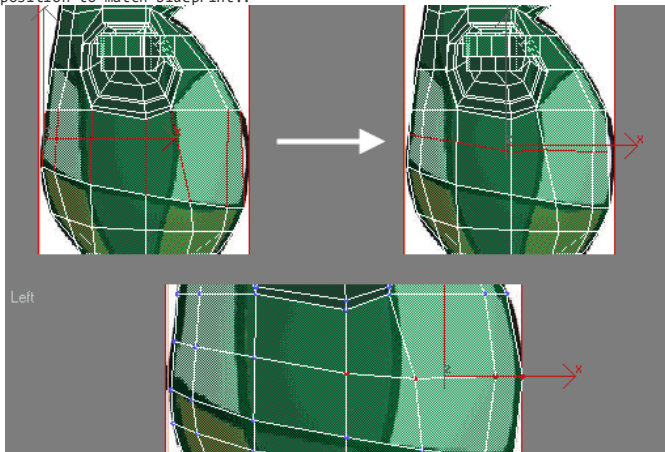
#### Kung Fu Panda Modeling (1.5)

After a quite long tutorial step, Part 1, Part 2, Part 3 and Part 4, we had a full model of Kung Fu Panda. Well, your Kung Fu Panda model is almost finish. We are only need to add pants for Kung Fu Panda model.

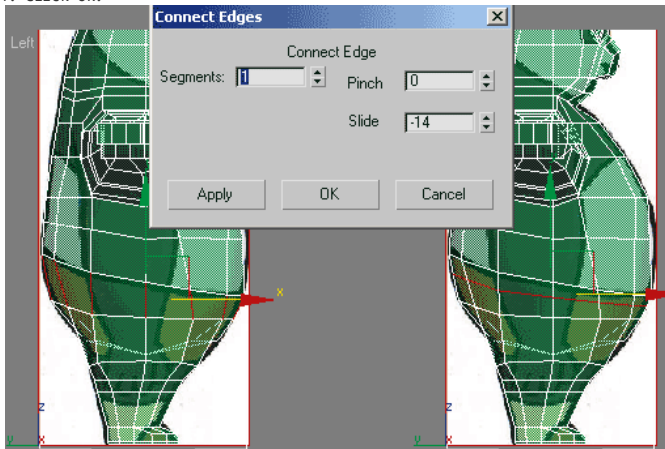
1. Continue your previous lesson. In Left viewport, modify several vertices position (left image below). Use blueprint behind for reference.



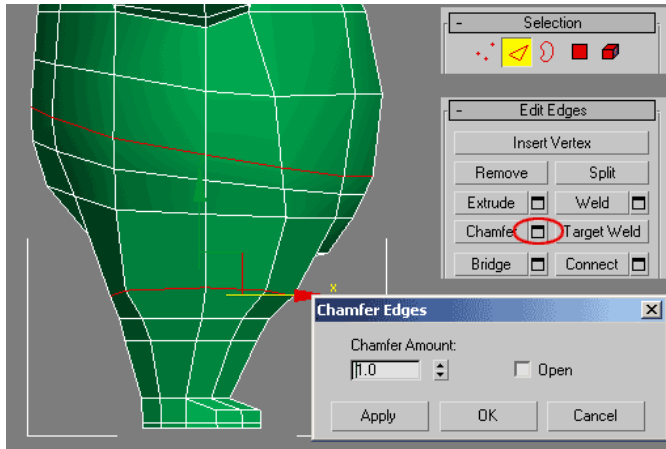
2. Change selection to Edge. Select vertical edges like image below. Use **Connect** to create horizontal edges. Activate Vertex selection and modify several vertices position to match blueprint..



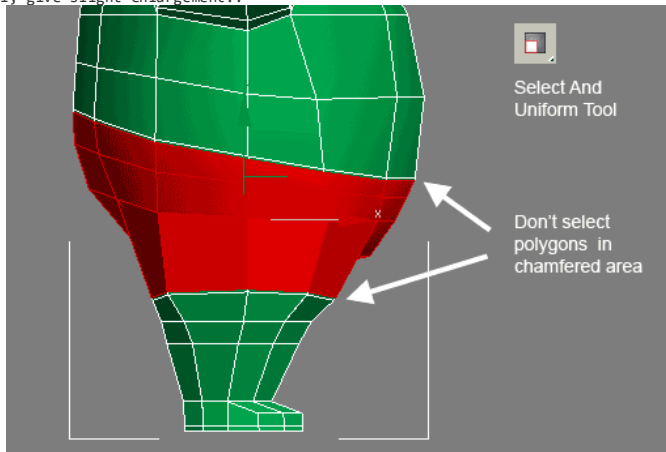
3. Again activate Edge selection. Select vertical edges like image below. Click Settings button right next to Connect. In opened dialog box, enter Slide = -14. Click OK.



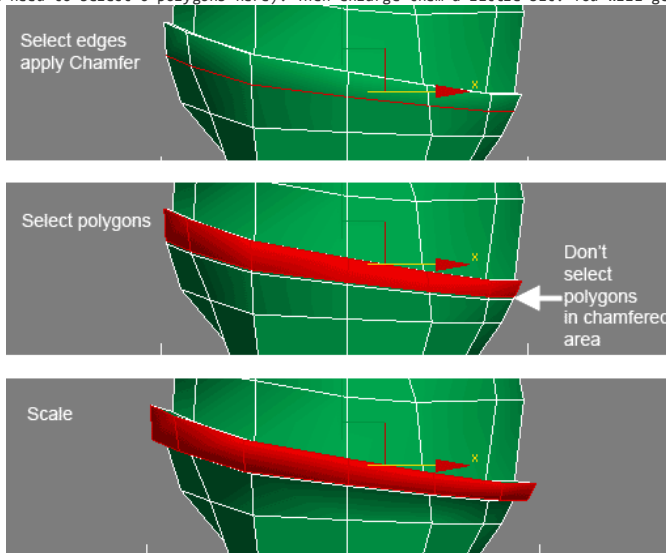
4. Select horizontal edges like image below. Tips: you can select one or two edges and then in **Selection** rollout click **Loop**. Click Settings button right next to **Chamfer**. In opened dialog box, makes sure Chamfer Amount=1. Then click OK. You have added small amount of chamfer.



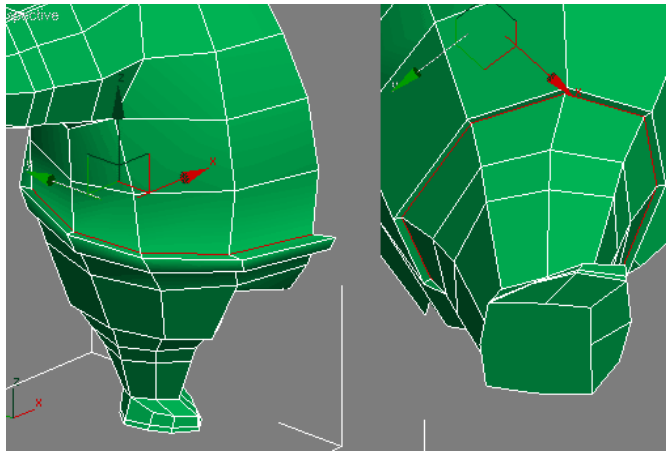
5. Activate Polygon selection. Select all polygons constructing pant. Make sure you select only polygons between chamfered edges. Then using **Select and Uniform Tool**, give slight enlargement..



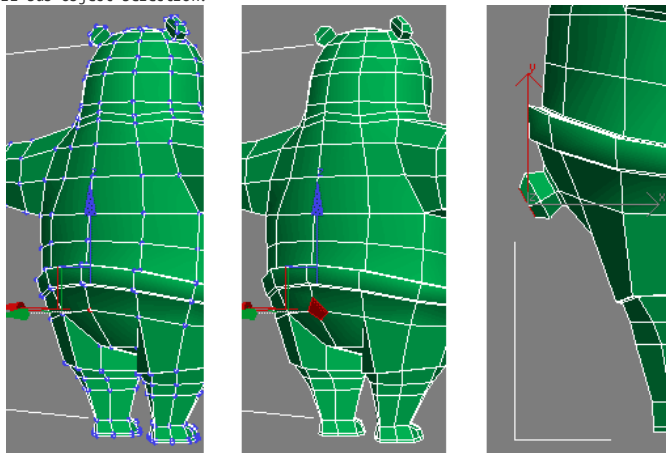
6. Activate **Edge selection**. Select edges like image below. Apply **Chamfer** with Amount=1. Change selection to Polygon. Select polygons like middle image below (you need to select 6 polygons here). Then enlarge them a little bit. You will get a belt.



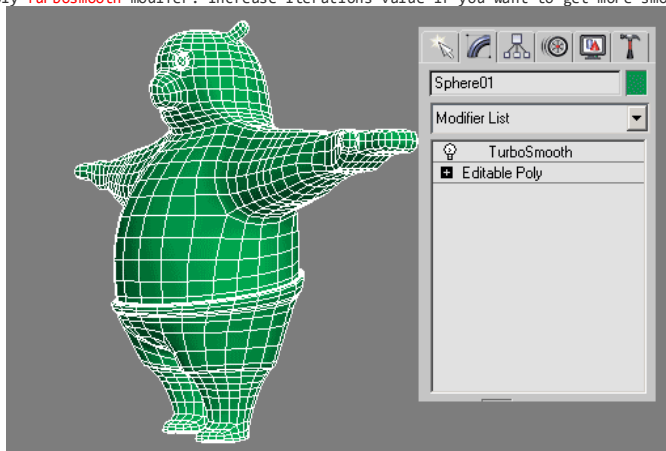
7. Next, select edges like image below (these edges separate pant and body). Give a slight amount of **Chamfer**, to make boundary between pants and body looks sharp, when we apply model with Turbosmooth.



8. Do we forgetting something? Yup, a tail. De-activate all sub-object selection. Right click model and choose Convert to Editable Poly. Then, in Perspective viewport, rotate view until you can see back of Po model. Activate Vertex selection. Select one vertex in the middle of Po's buttocks. Use **Chamfer**. Change selection to Polygon. Select newly created polygon. Then use **Bevel** three times to create a tail. De-activate all sub-object selection.



9. To finish this model. Apply **Turbosmooth** modifier. Increase Iterations value if you want to get more smooth model.



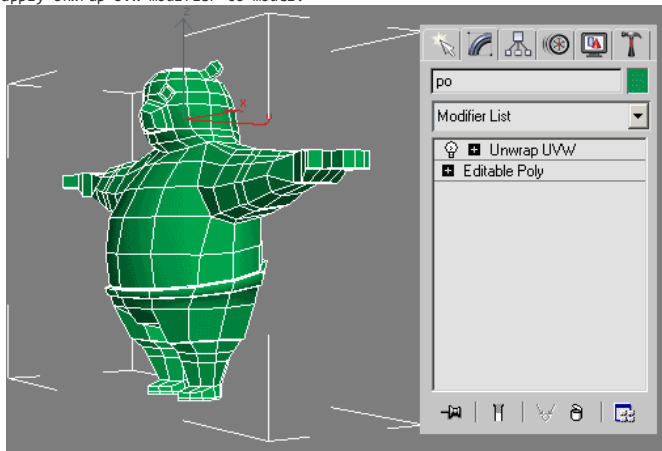
10. Congrats, you have created Kung Fu Panda model. In the next tutorial, we are going to add texture.



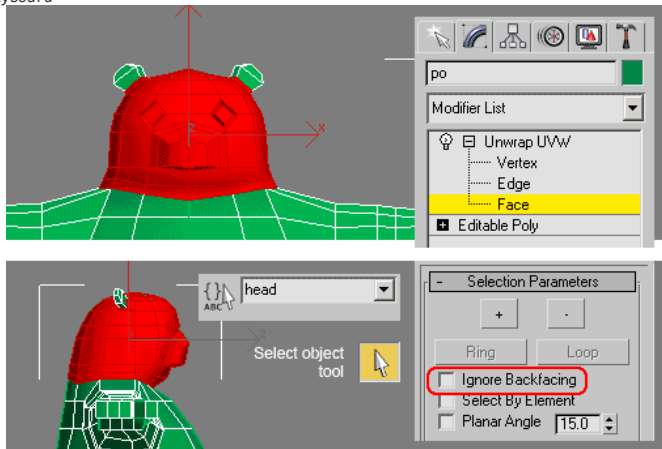
Kung Fu Panda Texturing (2.1)

It's time to texture our little panda, after we created him in Kung Panda Modeling tutorial. We are going to use **Unwrap UVW**. If you are unfamiliar with Unwrap UVW, consider to look at our previous tutorial: [Understanding Unwrap UVW](#) and [Unwrap UVW Texturing](#). It is quite hard to unwrap a complex model like human character or this panda. But, if you follow this detailed and step by step tutorial, you will be able to use techniques describe in this tutorial at any model. Let's unwrap!

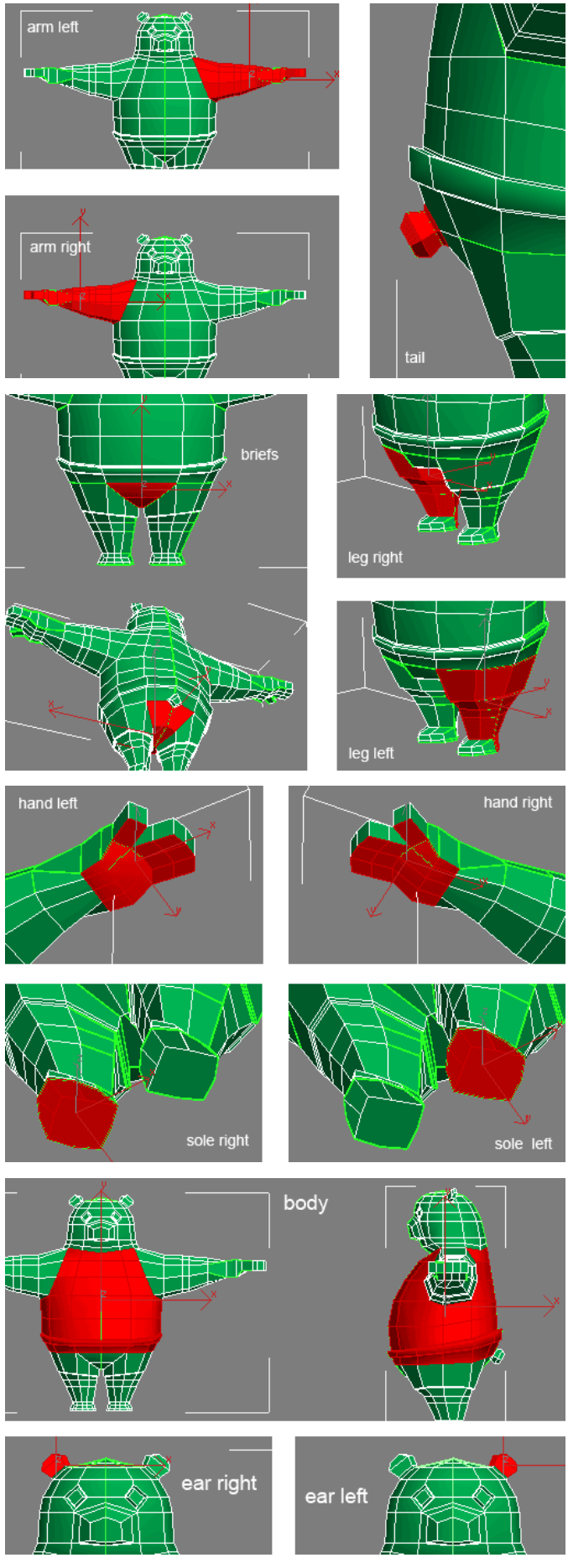
1. First, open kung fu panda model you created earlier. Or you can [download required 3D model here](#). Then, go to Modify tab. Remove Turbosmooth modifier. Then, apply Unwrap UVW modifier to model.



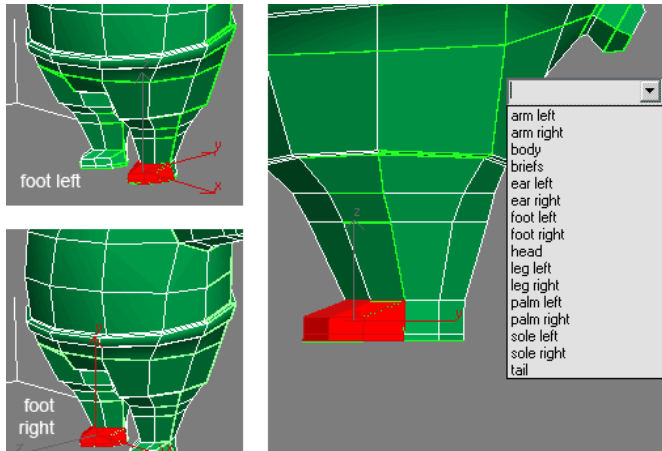
2. Next step is selecting model parts and name each of them. You need to do this in order to recall each object part later easily. In Modifier stack, click plus (+) sign left of **Unwrap UVW modifier**. Then highlight Face. Now, you are able to select faces. Select panda's head using Select Object tool. Don't select panda's ears. You can uncheck Ignore Backfacing for easy selection. If this option inactive, you can select front and back faces altogether. Use Ctrl+click to select more faces. And Alt+click to reduce selection. After all faces in the head are selected, name these faces in **Named Selection Set** (located in top of the screen). For example type "head" and press Enter in keyboard



3. Next you need select another parts of model and name everyone of them. Use images below as references. In total, you should have 16 named selection sets.







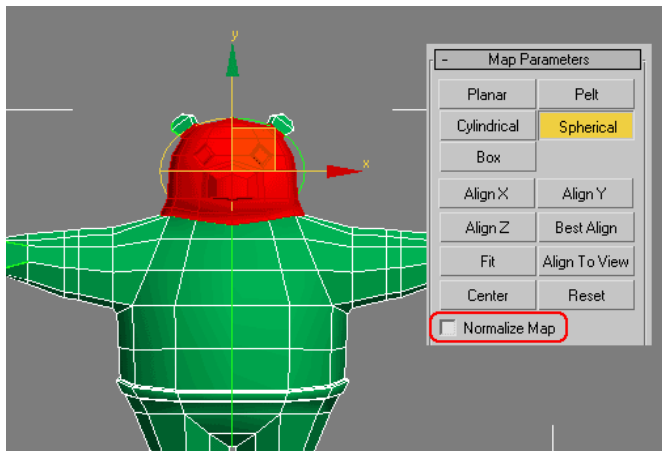
4. If you are happen to have wrong selection or name, click Edit Named Selection Sets button. In opened dialog box, you can highlight and delete the selection.



#### Kung Fu Panda Texturing (2.2)

You have selected and named each part of panda model in Part 1 tutorial. Next step is to assign each object to its proper mapping type. For example head is suitable with spherical mapping type. Arm is suitable with cylindrical mapping type and so on.

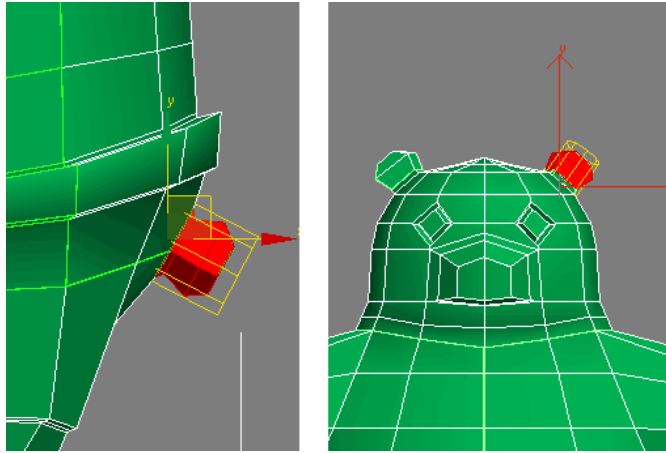
1. Continue your previous lesson. Make sure Face selection is active in Unwrap UVW. In Named Selection Sets, choose "head". All faces in the head will be selected. In Map Parameters rollout, click Spherical. Next, click Align Z for mapping orientation. Don't forget to uncheck Normalize map. If this option is active, you will get deformed unwrap faces (3dsmax will force unwrapped faces to fit rectangle)



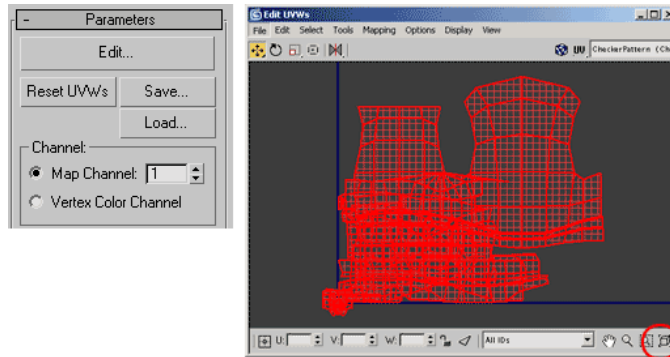
2. Repeat procedure above with other part of model. Refer to table below. Note: some mapping need to be adjusted, like in "tail", "ear left" and "ear right". Just rotate Gizmo to fit selected faces. Watch image below for reference.

Named faces	Mapping Type	Orientation
body	Spherical	Align Z
head	Spherical	Align Z
arm left / arm right	Cylindrical	Align X
leg left / leg right	Cylindrical	Best Align
tail	Cylindrical	Best Align + Rotate Gizmo
sole left / sole right	Planar	Align Z
palm left / palm right	Planar	Align Z
briefs	Spherical	Align X
foot left / foot right	Planar	Best Align

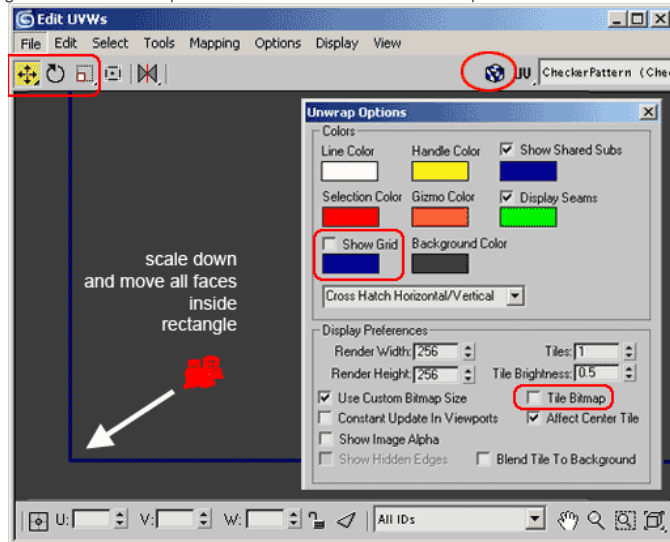
ear left / ear right Cylindrical Best Align + Rotate Gizmo



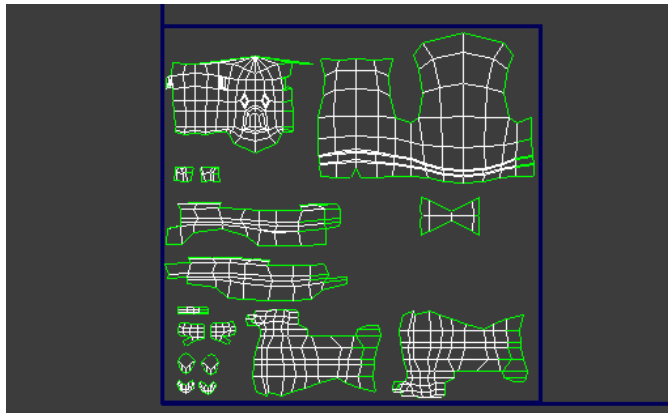
3. In **Parameters** rollout, click **Edit** button. **Edit UVWs** window will open. Click **Zoom Extents** button in the right corner. Now, you can see all faces.



4. Select all faces. Scale down to make them smaller. Then, move them near blue rectangle. You need to scale all faces several times before they are small enough to fit the rectangle. To make you able to see blue rectangle clearly, click **Options>Advanced Options**. In opened window, uncheck **Show grid** and **Tile Bitmap**. You can also de-activate **Show Map** button.



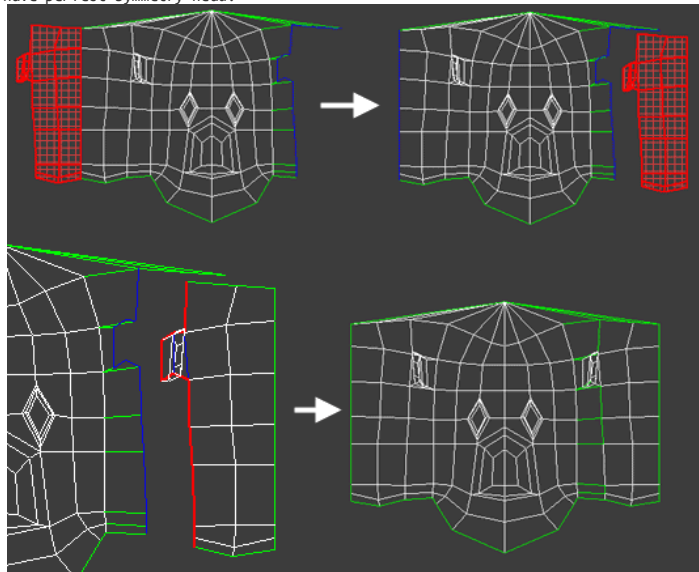
5. Use **Named Selection Sets** again to select each model part. Move and arrange each them inside the rectangle. Just arrange so that you can see all object part clearly. Later, you'll have to to arrange again.



### Kung Fu Panda Texturing (2.3)

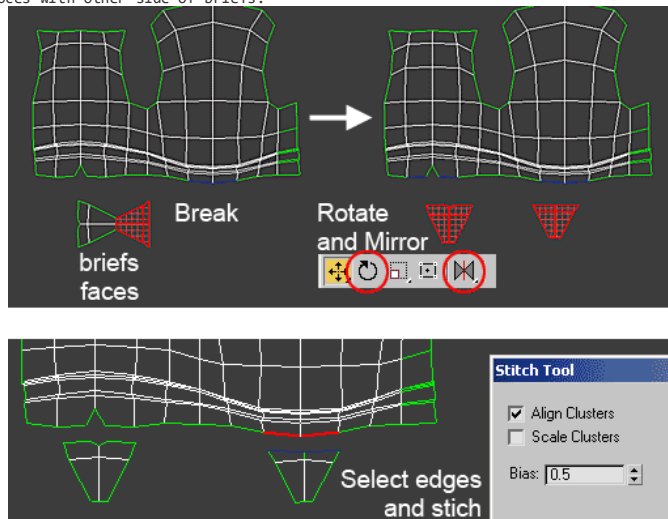
In previous tutorial (Part 1 and Part 2), you have unwrapped faces. But you can't directly use this unwrapped faces for texturing. We need to fix some face position for easier texture drawing. There are several places we need to fix, like in head, body, briefs and leg.

1. In **Edit UVWs window**. Focus on head faces. Select several faces at left side (look at image below). In main menu, choose **Tool>Break** (Shortcut Ctrl+B). Then, move detached faces to the right side. Change selection to Edge. Select several edges like image below. Use Ctrl+click to select more than one edge. You need to zoom in to select all edges. Then, choose **Tools>Stitch** Selected. Just click OK in opened dialog box. You'll have perfect symmetry head.

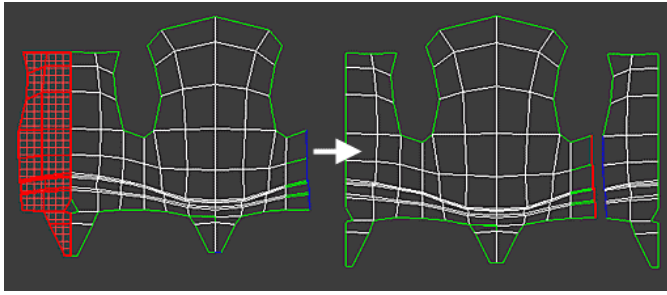


2. Next, we are going to fix body, briefs, and leg faces. Most people use Pelt Mapping when unwrapping legs. But in this tutorial I will only use standard unwrap uvw. Pelt Mapping will be discussed in another tutorial.

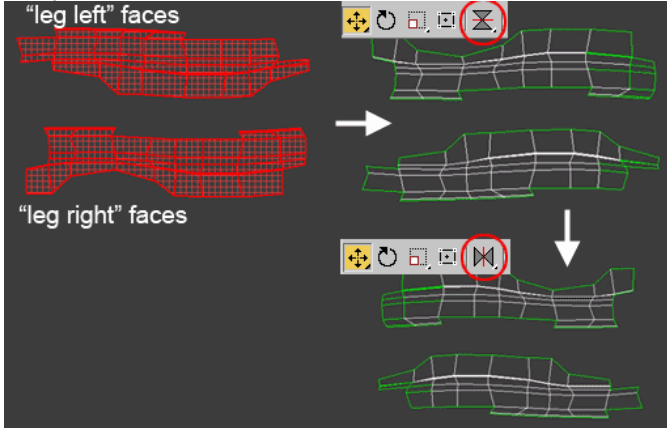
Select right side briefs faces. Use **Break** (Ctrl+B), and move each of them near the body. Look at image below fore reference. Use Rotate and Mirror Horizontal to each side of briefs. Then, change selection to Edge. Select 2 edges in body. Choose **Tools>Stitch** selected. In opened dialog box, uncheck **Scale Clusters** and then OK. Repeat the same proces with other side of briefs.



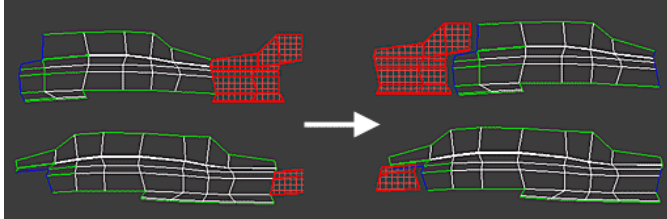
3. Change selection to Face. Select faces at left side of body. Break, move to the right and Stich them.



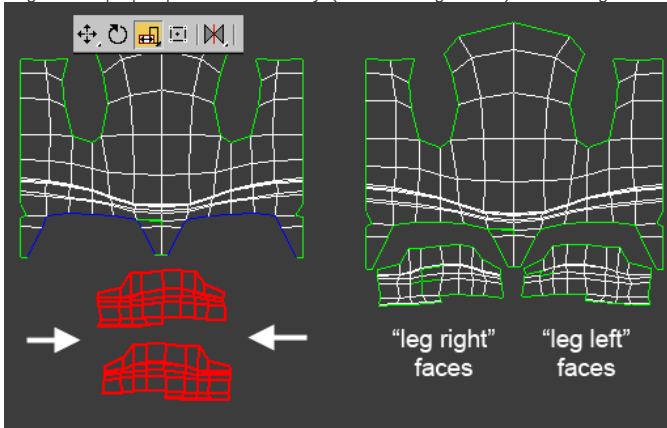
4. Now, leave body faces for a while. Let's modify legs faces first. Select both legs. Click Mirror Vertical, then Mirror Horizontal. Mirror Vertical is available when you click and hold Mirror Horizontal button.



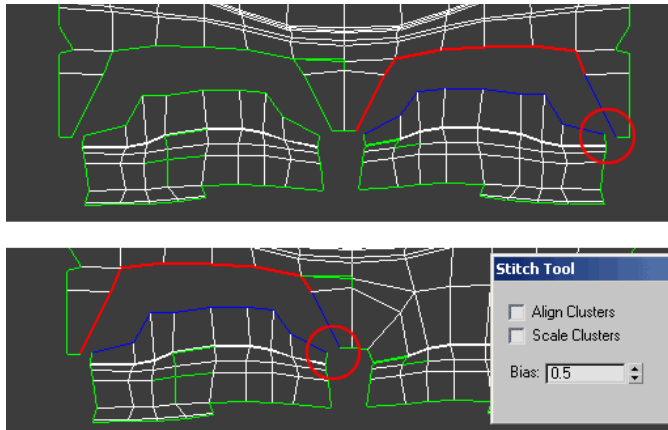
5. Select several faces at right side of legs (look at image below). Break, move them to the left and Stitch



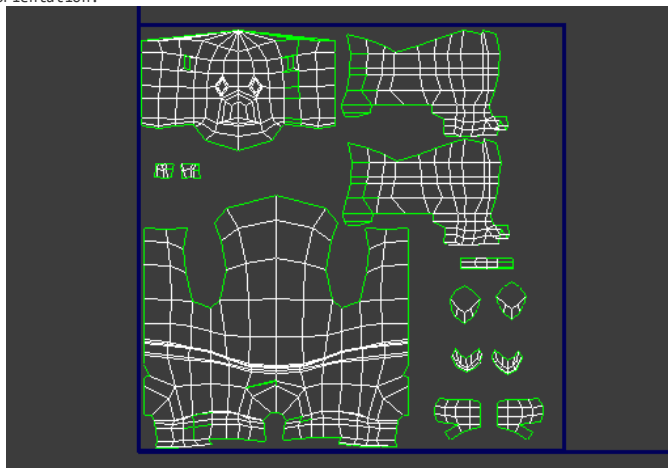
6. Now, select both legs. Use Scale Horizontal to reduce legs width. You can get **Scale Horizontal** button, if you click and hold Scale button. Then move each leg to its proper position near body (look at image below). Place legs as near as possible to body.



7. Change selection to **Edge**. Select several edges like image below. Then choose Tools>Stitch Selected. This time uncheck Align clusters and Scale clusters. Click OK. Do stitching on one leg at a time. After stitching, you'll notice that in circled area there are unweld vertices. Change selection to Vertex. Go to Tools>Target Weld. Select one vertex in circled area, and move them to another vertex. We have finished fixing the faces position.



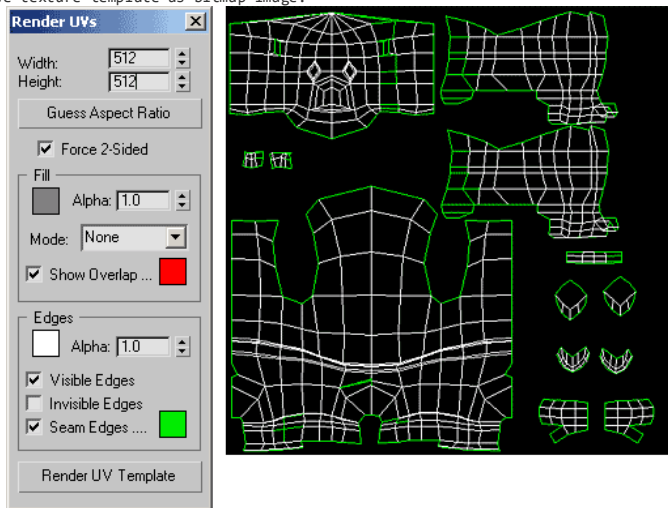
8. Now, you can arrange model parts to fit rectangle area. Use scale if necessary. Make sure they are all inside the rectangle. Note: I use mirror to change arm orientation.



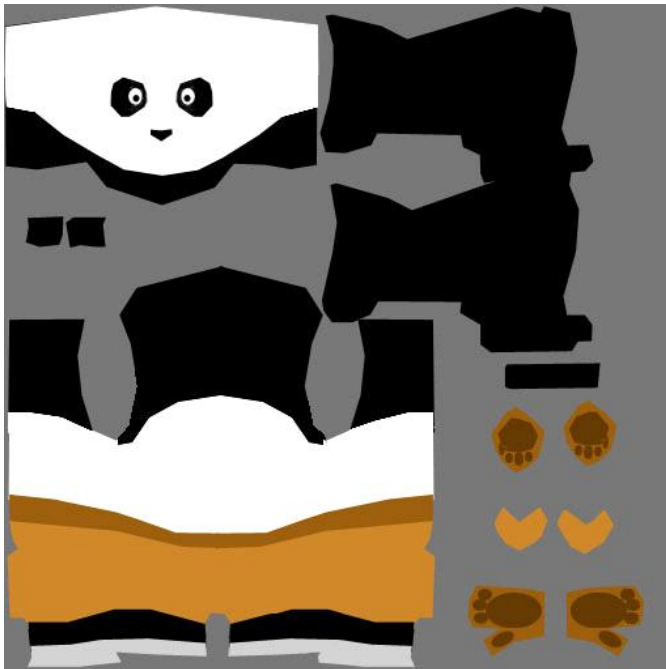
#### Kung Fu Panda Texturing (2.4)

After we have created and fixed unwrapped faces in previous tutorials, we are ready to make texture template.

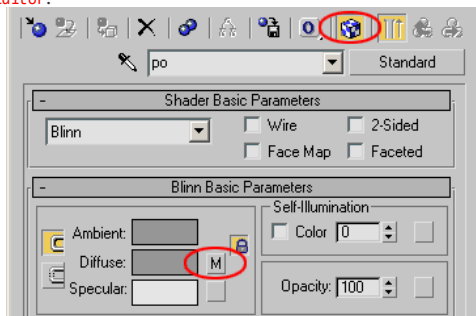
1. In Edit UVs window, choose Tools>Render UV Template. Enter texture size. For example I use 512x512 pixel. Then, click Render UV Template button. You can save texture template as bitmap image.



2. Open saved image in your image editing software, like Photoshop. Draw texture based on that image. Image below shows rough texture I created based on template.



3. Back to 3dsmax. Open **Material Editor**. There's one material applied to panda model. Remember, you applied this material while in modeling process. Select this material. Click **Show Map** button, to make applied material appear in viewport. In **Blinn Basic Parameters**, click small button right next to **Diffuse**. In **Material/Map Browser** choose bitmap, and then select texture image you have created before. When finished, close **Material Editor**.



4. Apply Turbosmooth and render your scene. Image below shows example of rendered result. Next step, I will show you how I create more realistic material.



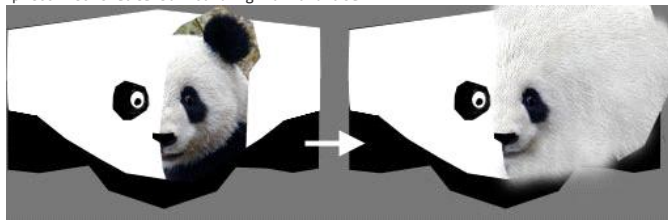
#### Kung Fu Panda Texturing (2.5)

This tutorial section will show you how to create more realistic texture for your Kung Fu Panda model. Original Kung Fu Panda Movie uses hair and fur, which did not explained here. Here, I just show you how to apply bitmap texture. Note: This tutorial is not a detailed step by step tutorial. I assume you are familiar with Photoshop. I just give a brief explanation how I create my texture.

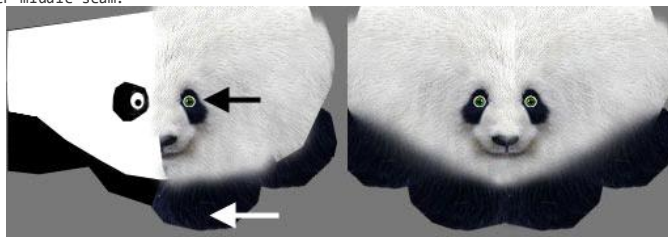
First, prepare images for references. One from Kung Fu Panda Movie image, and the other is real life panda image.



1. Let's begin with panda's head. I crop half of real panda image and drag to the template. Scale that cropped image to fit the template. Then use Clone Stamp tool to create surrounding fur and face



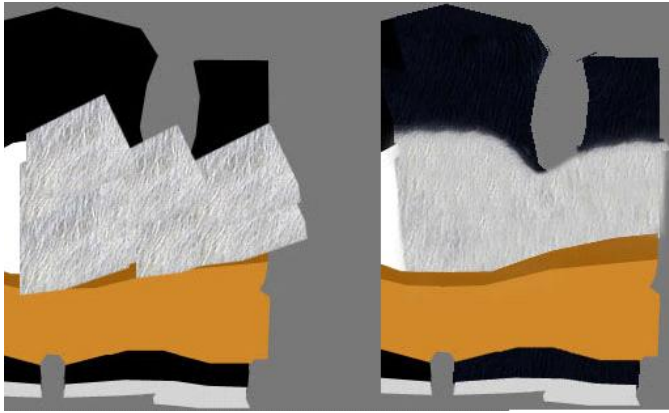
2. I crop the eye from Kung Fu Panda Movie image, and drag into texture template. Then also crop some part in hand area of real panda image to add black fur. For left side of face, I just duplicate layer and use Flip Horizontal (Edit>Transform>Flip Horizontal). Next, use Clone Stamp tool to cover middle seam.



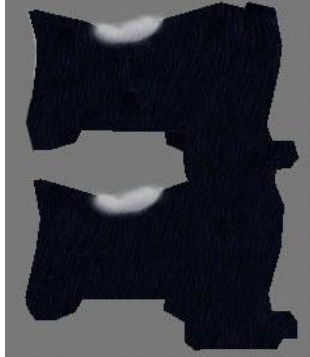
3. Next, draw dark color in ear area, to make smoother color transition between head and ears. Then, fix eyes shape. Just use Clone Stamp tool with small brush size. Clone from dark fur area and white fur area.



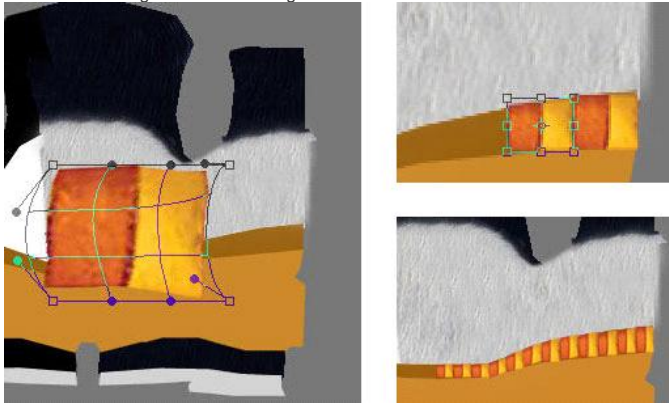
4. For body, I crop several part of fur in real panda image. Resize and copy them several times to cover body. Then I use Clone stamp tool to make all fur copies blend well.



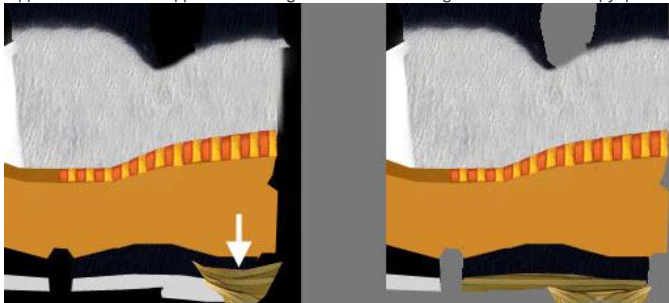
5. The same technique applied with black fur. Cropping, copying and clone stamping. Note, add a little white fur with Clone stamp tool in armpit area, to make color transition between body and arm.



6. For belt, I just crop some belt image from Kung Fu Panda Movie image. Unfortunately I have curvy cropped belt image. To modify it, I use Edit>Transform>Warp. After that, resize and position it in belt area. Sometimes I need to distort image (Edit>Transform>Distort). I repeat this process several times until I get full belt image.

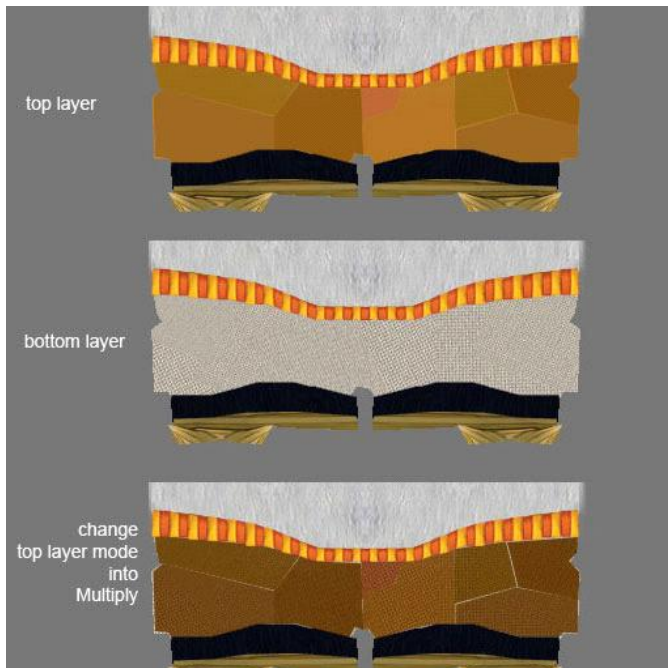


7. For legs, same techniques applied here. I cropped from Kung Fu Panda Movie image. Distort and copy paste to create desired looks

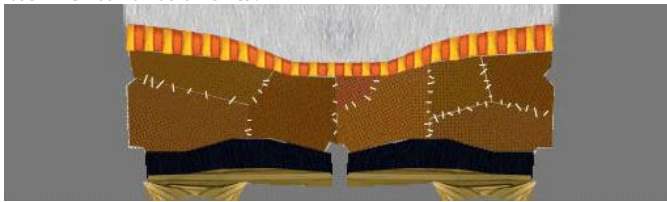


8. After that, I duplicate layer and flipped to create other side of body. Next is pants. I draw several pieces of solid color in one layer. Then under this layer, I create texture layer. I just randomize several texture with different texture size and rotation. Then, change top layer mode into Multiply. Sometime you can use Color mode too, depends on what color and texture you are using





9. For stitch effect. I just use Line Tool a lot of times.



10. For another part of texture image, like in palm and foot, same technique applied here. I just use crop, copy from other image and sometimes drawing. Image below shows example of finished texture. Then, save texture and use as Diffuse map. You can add your own bump or specular map if you want.



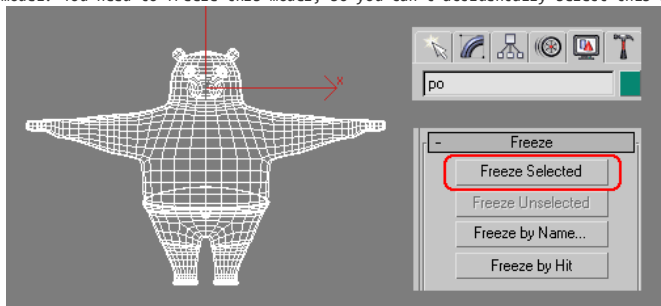
11. Congrats you have finished Kung Fu Panda Texturing tutorial. Image below shows rendered result, applied with texture above. Next is Kung Fu Panda Skinning and Rigging tutorial.



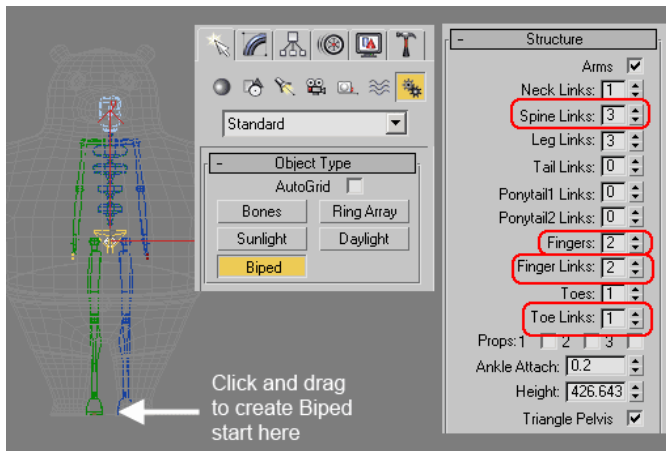
Kung Fu Panda Skinning And Rigging (3.1)

After you model and texture Po, character from Kung Fu Panda The Movie. Now, you can **rig** that panda model. Rigging is the process of placing skeleton system inside a mesh. There are 2 types of "skeleton" you can use in 3dsmax: Bones and Biped. Bones is usually used if you want to create bones manually. Otherwise, Biped is like a pre-built skeleton system. It's quick and fast to use. This tutorial will show you how to apply Biped to our Kung Fu Panda Model!

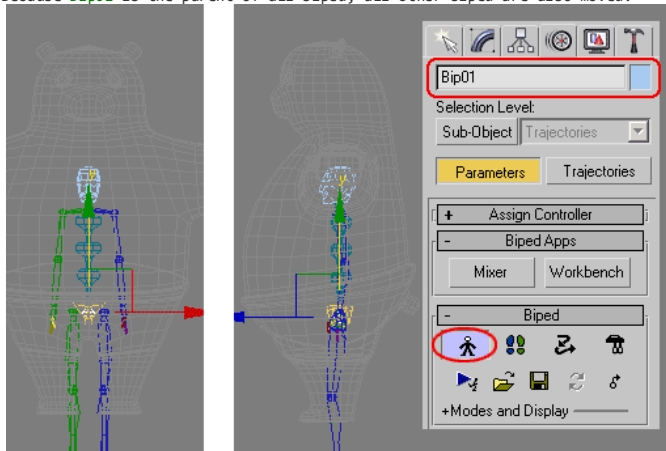
1. First, open textured kung fu panda model you created earlier. Or you can [download required 3D model here](#). Select model, go to Display tab and Freeze this model. You need to freeze this model, so you can't accidentally select this model.



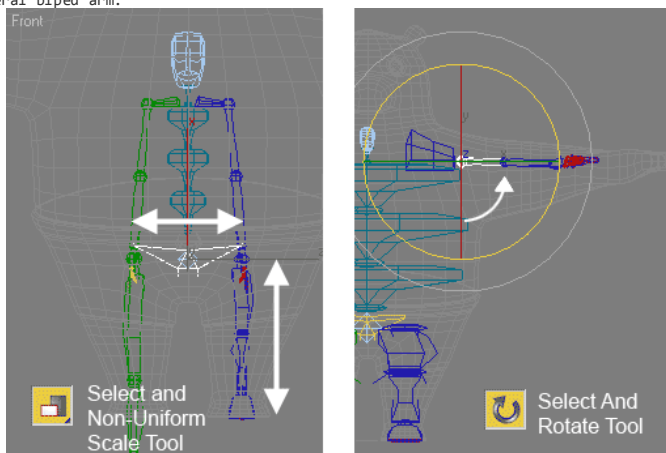
2. Next step is creating **Biped**. Go to **Create>Systems**. Click **Biped** button. Then, click and drag in Front viewport to create Biped. Biped systems consist of several linked "bones". Each "bones" is called "biped". After you created Biped, in Structure rollout, modify Biped structure to fit model requirement. Look at image below for reference.



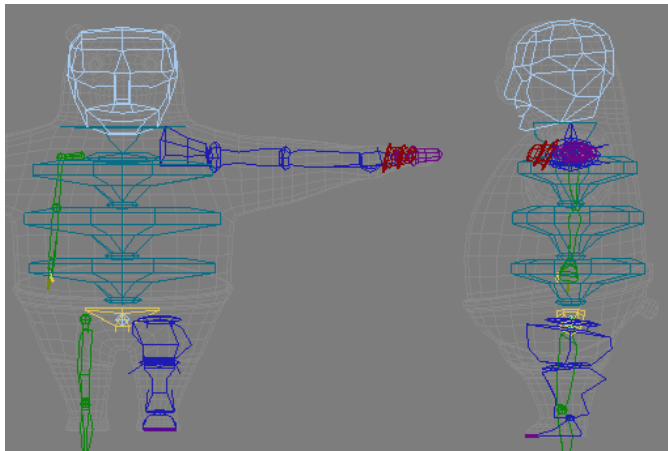
3. Next, you need to position Biped inside the model. Make sure **Bip01** in Biped is selected and go to **Motion tab**. Then in **Biped rollout**, click **Figure mode**. This mode allows you to modify Biped structure and shape. Position **Bip01** in the middle of model (look at image below for reference). Because **Bip01** is the parent of all biped, all other biped are also moved.



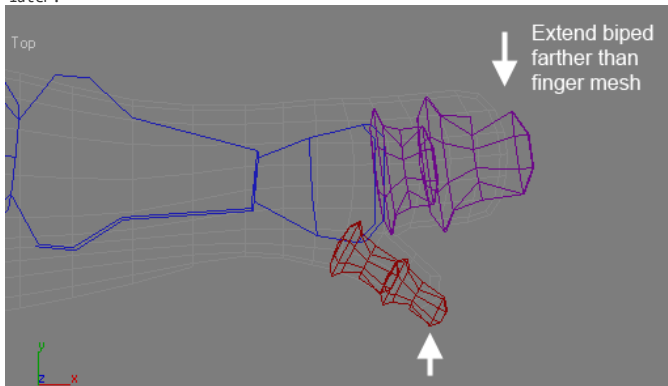
4. Next, you need to modify each biped shape and position. Using **Select and Non Uniform Tool** stretch biped shape to fit the model. Also you need to rotate several biped arm.



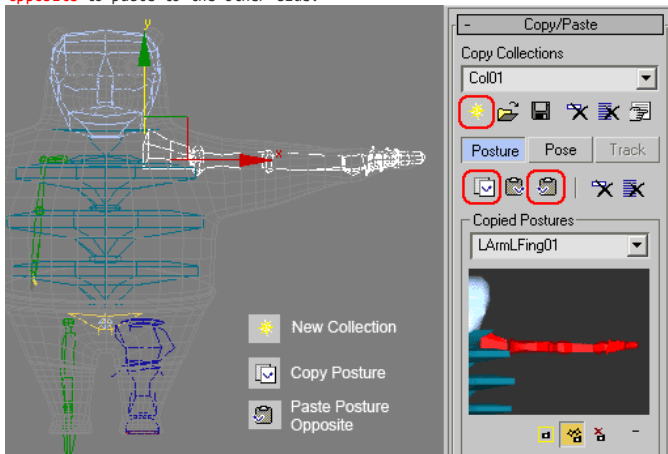
5. Modify each biped shape. It's so simple, just use **Select and Non-Uniform Scale** in **Front** and **Left** viewport. You don't need to modify all biped. Just modify one side of model (left or right side).



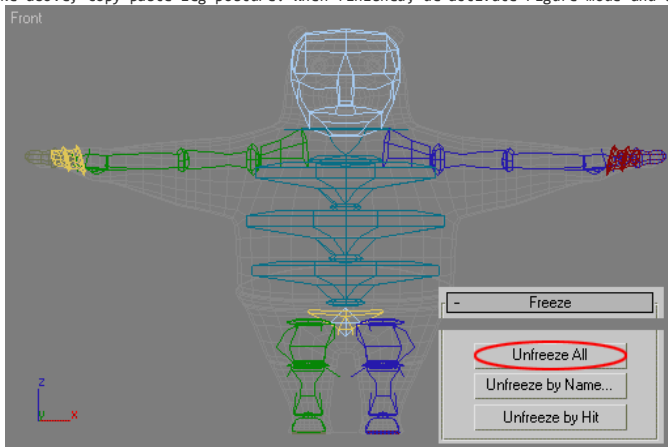
6. Special note: When you modify biped for fingers, extend biped farther than finger mesh. This is the trick so that you don't need tweaking in skinning process later.



7. Next, we are going to copy-paste biped shape position to other side. Double click one of shoulder biped. The rest of arm and finger biped will be selected. Open **Copy/Paste** rollout. Click **New Collection** button to name the selection, then click **Copy Posture** button. Finally, click **Paste Posture Opposite** to paste to the other side.



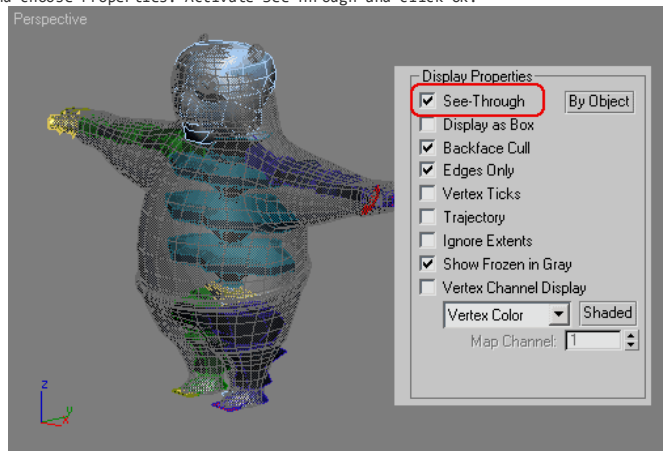
8. Using the same process like above, copy-paste leg posture. When finished, de-activate Figure mode and unfreeze the model..



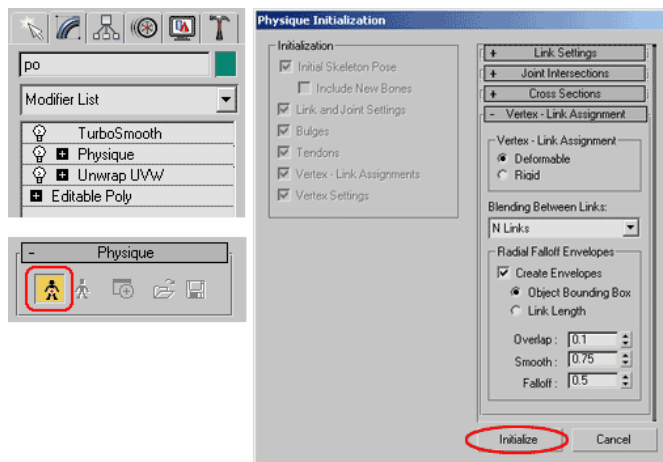
### Kung Fu Panda Skinning And Rigging (3.2)

After we add Biped to model in Part 1 tutorial, next we are going to go into skinning process. Skinning is required to make skeleton system works by deforming the mesh. In 3dsmax, you can use **Skin** or **Physique modifier** to skin a model. In this tutorial, you will use Physique modifier to skin Kung Fu Panda Model. Physique is faster to use, if you use Biped for skeleton system.

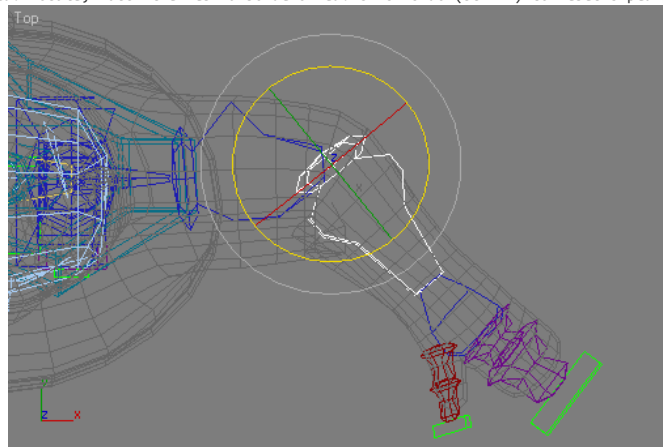
1. This process is not necessary, but can help you to see biped inside model in Perspective viewport (Smooth and Highlight display). Select model, right click and choose Properties. Activate See-Through and click OK.



2. While model is still selected, apply **Physique** modifier to object. In **Modifier Stack**, position **Physique** modifier below **Turbosmooth** modifier. In **Physique** rollout, click **Attach to Node** button. Then click **Bip01** in viewport. If you have difficulties in selecting Bip01. You can press H in keyboard. Highlight Bip01, and click Pick button. A new window will open. Click **Initialize** button. Now, your model is skinned.



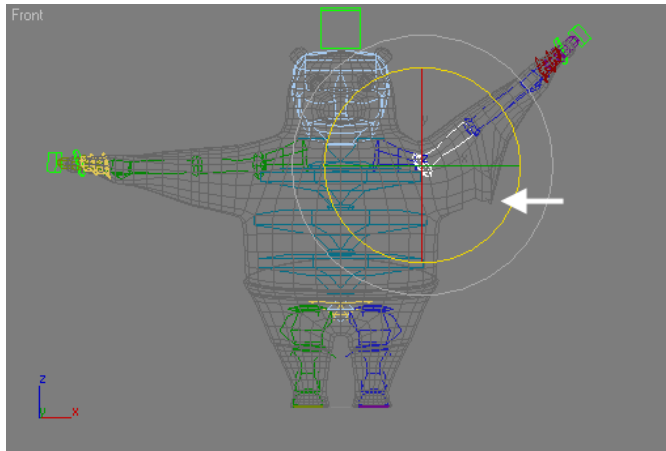
3. Try to select one of biped. Rotate, watch the mesh also deformed. Click Undo (Ctrl+Z) to reset biped position.



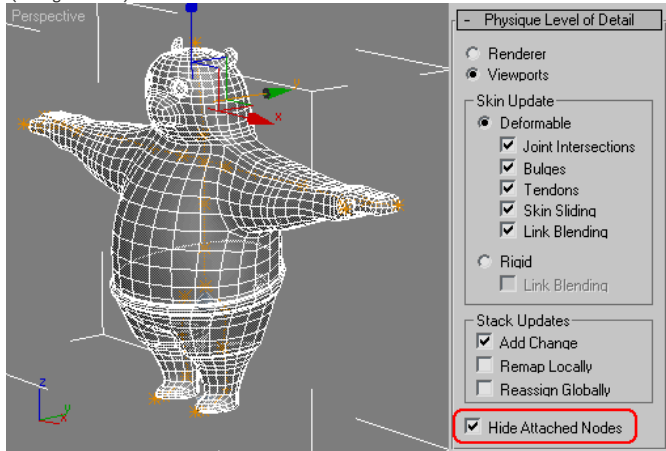
### Kung Fu Panda Skinning And Rigging (3.3)

Skinning process is not finished yet. We need to check whether model is deformed in the way we want. If not, we need to modify several **Physique attributes**. Most of the time, this adjusting process is quite complicated. This tutorial will show you only the basic. But, I believe it's quite enough to create nice animation.

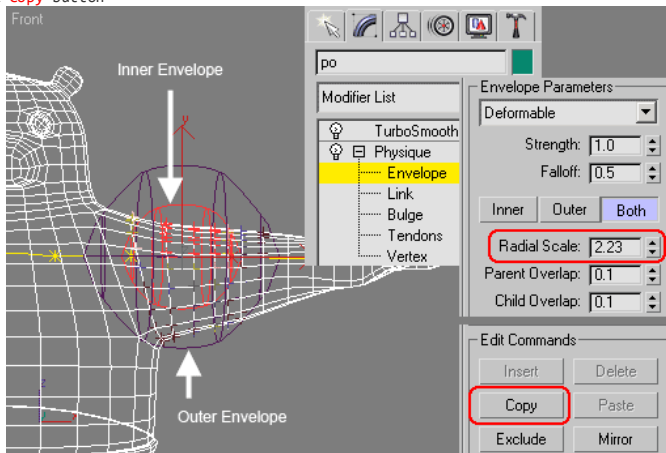
1. First, try to select one of upper arm biped. Rotate. Notice that some part of arm is not deformed along arm movement. Click Undo (Ctrl+Z) to reset biped position..



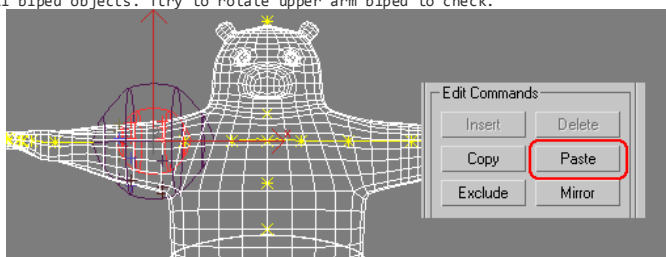
2. Before you begin adjusting, you may want to **hide biped** in viewport. Sometimes it's hard to see clearly in viewport when biped is visible. Go to **Modify** tab. Highlight **Physique** modifier in **Modifier Stack**. In **Physique Level of Detail** rollout, check **Hide Attached Nodes**. Biped will be invisible. If you want to display Biped again, just uncheck this option. Without Biped visible in the screen, you can see only **biped links** (orange lines)



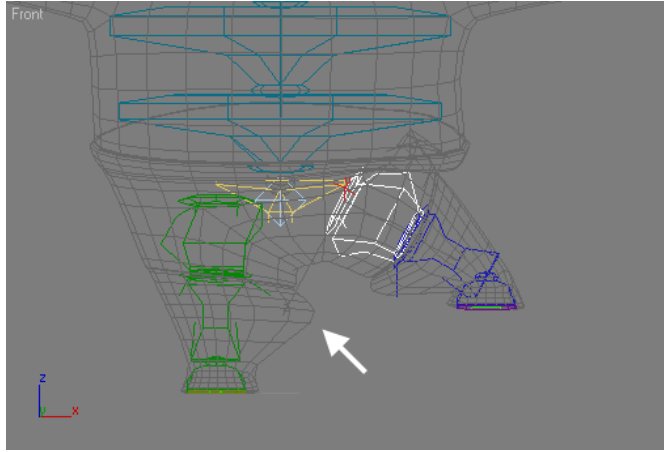
3. In **Modifier Stack**, click plus (+) sign at left of **Physique** modifier. Then, select **Envelope**. Biped link will turn yellow. Select **biped link** at the upper arm. You will see red and grey circle. Those circles are called **Envelope**, which define area influenced by certain biped. **Envelope** has 2 areas, **inner** and **outer**. **Biped influence in inner area is higher than outer area**. Notice that, enveloped in upper arm is not covering all desired area. You can fix this by enlarging envelope. In **Blending Envelopes** rollout, focus on **Envelope Parameters**. Make sure **Both** is selected. Increase **Radial Scale** to 2.23. Both inner and outer envelope will be enlarged. After that, in **Edit Commands** click **Copy** button



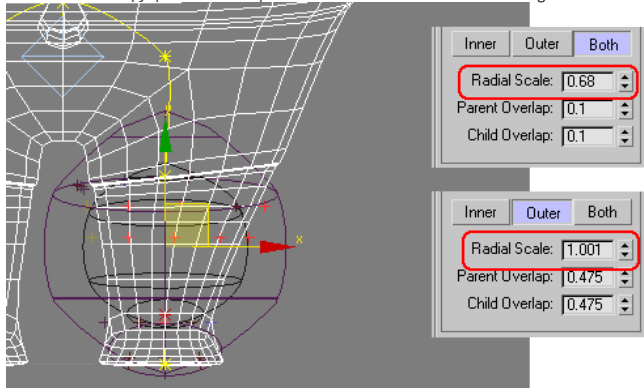
4. You need to apply Envelope changes to the other side of arm. You can modify it manually. But, remember that you clicked Copy button before. Now, select other upper arm link and click Paste button. Both arm is now fix. You can de-activate Envelope selection. Un-hide Attached Nodes to display all biped objects. Try to rotate upper arm biped to check.



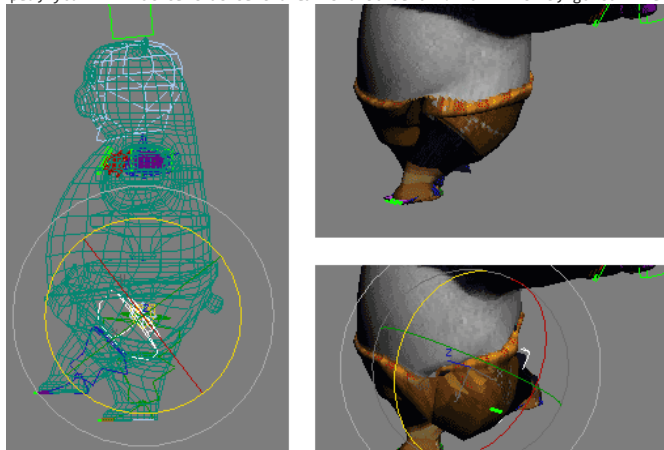
5. Now try to rotate upper leg biped. Notice that, mesh in other legs is also deform. To fix this, just go to Envelope selection again



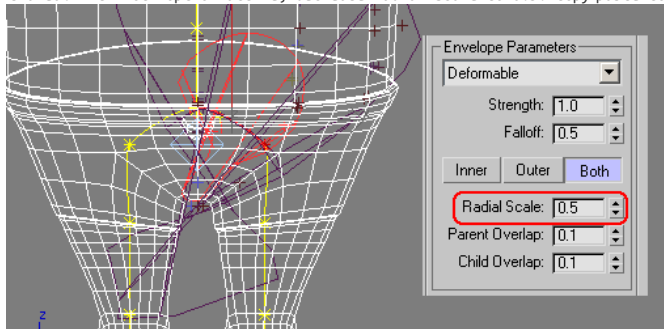
6. Select biped link in lower leg. First, make sure **Both** option is active. Decrease **Radial Scale** to 0.68. And then activate **Outer** option, then decrease **Radial Scale** to 1. Copy-paste envelope to the other side of lower leg



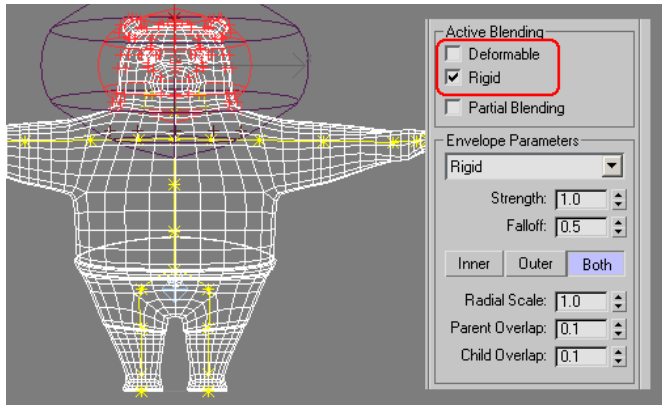
7. If you rotate upper leg biped, you will notice that belt area is also deform. To fix this, go to Envelope selection.



8. Select biped link in pelvis area. With **Both** option active, decrease **Radial Scale** to 0.5. Copy-paste to the other side of pelvis.



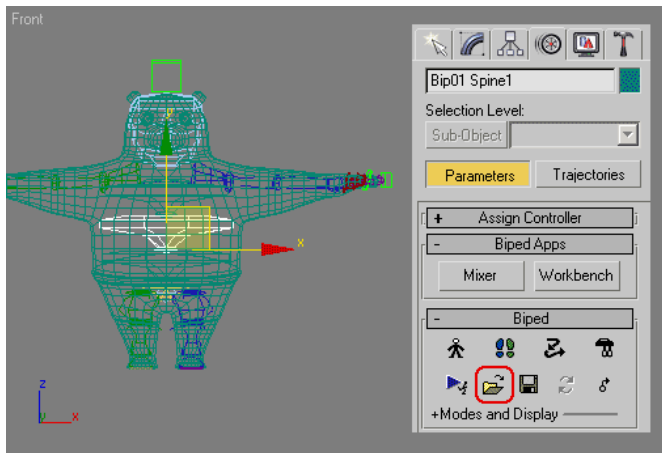
9. The last one. Select biped link in head. In **Active Blending**, uncheck **Deformable** and check **Rigid**. Head should not deformed a lot in animation. When finished, de-activate **Envelope** selection. Skinning process is done. Actually we need more adjustment in skinning process, but that should be enough for now. I will try to write more tutorial about this subject in the future.



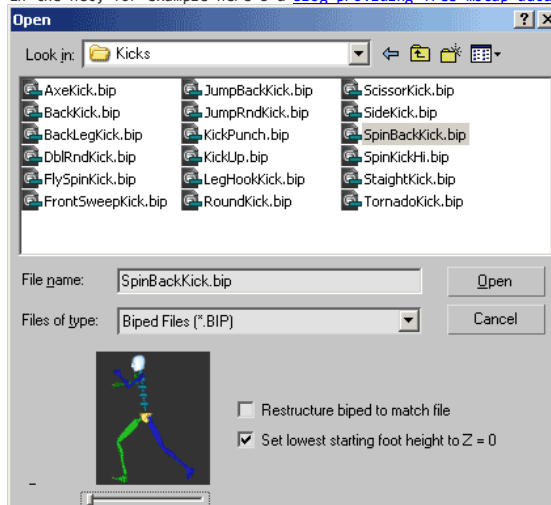
Kung Fu Panda Animation (4.1)

This tutorial is the last of Kung Fu Panda tutorial series. After all hard work from modeling, texturing, rigging, and skinning, now ready for final lesson. You will create animation for our Kung Fu Panda model. This time you will use [motion capture data](#) to create animation. Motion capture ([mocap](#)) data is animation data stored from capturing real actor movement. We can re-use this animation data to any object, like our Kung Fu Panda model. Using mocap, you can create animation in a minute

1. Continue your previous lesson or [download required 3dsmax file here](#). Select one of biped and go to Motion tab. In Biped rollout, click Load File button.



2. A window will open. In this window, you can select any motion capture data file you have. This motion capture data should have BIP extension. You can use BIP file available in your 3dsmax CD/DVD. Usually they are located in Samples/Motion folder or you can look for free motion capture data available in the net, for example here's a [blog providing free mocap data](#)



3. After you load BIP file, your model will use the animation movement stored in that file. Image below shows Kung Fu Panda doing some backflip kick.



