

### Rendering to Video the Final Animation.

Building on what you have achieved to-date, this tutorial will bring together the character and unicycle, add lights and render to video then add sound to the final short animation.

In this tutorial you will:

- import your character model into the unicycle animation prepared last week;
- position your character over the seat of the unicycle and bind the base or 'spine' node to the centrePivot (from the unicycle animation). This will force the character to follow the unicycle around its circular path;
- parent the character's feet to the pedals (using the hypergraph:connections tool) so they follow the pedals as they rotate;
- weight which groups of polygons are affected when the animation executes (soften the bending of the various limbs of your character so they aren't overly distorted);
- add lights to the scene;
- render to video, and;
- add a non-copyright sound track.

### Remember to save at the end of each stage!

There are 5 stages to this prac. Some will need to be repeated. It is important to follow the order as each has an affect on the proceeding stage

The stages involved in rendering to video the final animation include:

1. import the character into the animated unicycle file
2. positioning the character over the unicycle seat
3. positioning the feet over the pedals
4. parenting the spine and feet to the unicycle anim
5. correcting unwanted distortions (repeat stage 4)
6. add lights
7. batch render
8. add sound

#### Stage 1

##### *Importing the character into the animated unicycle file*

Before importing your character into the animated unicycle scene, open your character file save as a new file and delete all redundancies using the hypergraph:connections tool. Make sure all the mesh elements are polygons and their pivots are centred.

Now, open the unicycle animation file. Then import your rigged character:

File > Import

You may need to re-reference the texture files for hair and so on, and check that Shading > Hardware Texturing is on.

You may need to scale the rigged character. To do this, create a global control:

Polygon box (200 200 200)

Place it at the origin. Call it globalControl. In the hypergraph:connections editor MMB drag rigging hierarchy onto globalControl. Then select globalControl and scale from channels box.

Save as CharUnicycleAnim01

#### Stage 2

##### *Positioning the character over the unicycle seat*

Select the base node (spine or globalControl) of your character rigging and move the character over to the unicycle. Position your character over the seat of the unicycle. Be careful when rotating that you rotate about a single axis at a time (if you have too many complex multi-axis rotations your animation results may become unpredictable).

Save as CharUnicycleAnim02

#### Stage 3

##### *Positioning the feet over the pedals*

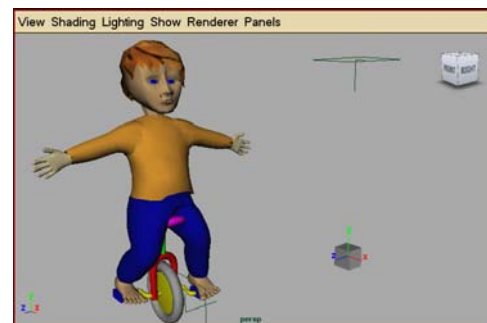
Make sure you have set the preferred angle for your leg ikHandles. Select ikHandle for each leg (separately):

Skeleton > Set Preferred Angle

Now, position the feet over the pedals by selecting and moving the appropriate ikHandle and rotating the necessary joints and bones. This will take a lot of jiggling to get right – so, be patient).

You may need to move the seat down so the feet can reach the pedals.

Save as CharUnicycleAnim03



## Stage 4

### *Parenting the spine and feet to the unicycle animation*

After importing your character into the unicycle animation file you will notice that all its named parts are now appended with the filename as a prefix. Go through and remove this for arms, legs, feet, hands, body and the ikHandles for the legs and arms etc.

You can do this from within the hypergraph:connections editor

RMB > rename

In other words, before you start dragging and dropping the various components to their positions in the hypergraph:connections make sure they are all logically named (LFT and RHT leg ikHandle, LFT and RHT arm ikHandle and so on).

In the hypergraph:connections tool, locate the spine (or globalControl) and centrePivot nodes. Using the middle mouse button carefully drag and drop spine (or globalControl) onto the centrePivot node.

When you now scrub the animation timeline you should see the character connected to the unicycle and following it as it moves around its circular path.

Before connecting the ikHandles for the legs to their respective pedal nodes, make sure you have positioned the feet exactly where you want them over the pedals. Make sure your character is sitting directly over the seat so it has lots of extension travel in the legs, otherwise you will get weird twisting distortions occurring. In extreme cases you may need to delete the ikHandle, realign the leg joints over the pedal and then create a new ikHandle (set preferred angle)

Now, in the hypergraph:connections tool, locate the LFT and RHT leg ikHandles and the LFT and RHT pedal nodes. Using the middle mouse button drag and drop each ikHandle onto its respective pedal node.

When you scrub the animation timeline this time you should see the feet rotating with the pedals.

Save as CharUnicycleAnim04

## Stage 5

### *Correcting unwanted distortions*

When you run your animation you may notice that some parts of the character are unnaturally distorted – especially around the hip area. When the ikHandle bends the skin it distorts the polygons in the immediate area. The affect is not always as localised as needed. It is possible to reduce the effect of this distortion by

‘weighting’ how much effect an ikHandle has on a group of polygons.

You need to make these changes before you parent the character to the unicycle. So,

Open CharUnicycleAnim02.

Hide the unicycle model by selecting the centrePivot.

Start by selecting one of the leg ikHandles and bending the leg up. You will see there is too much deformation around the hip area.

In a previous step you should have renamed the various parts of the legs:

RHTfootJoint  
RHTlegikHandle  
RHTkneeJoint  
RHTleg, and so on...

These are the parts we will be working with in this stage.

In wireframe, select the RHTleg’s polygonal shell (or skin):

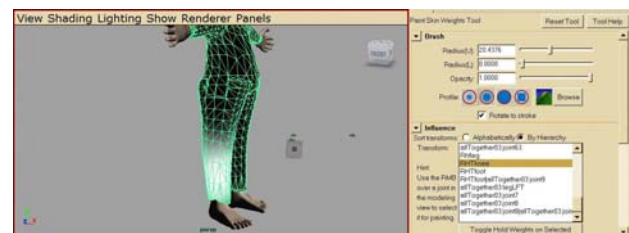
Skin > Edit Smooth Skin >  
Paint Skin Weights Tool

In the Influence list locate and select RHTleg. Change back to Smooth Shade All. You should notice that your character is now displayed in black and white with shades of grey. The whiter the shade the more influence the leg joint is exerting on the skin.

To reduce its influence, under Paint Weights, set :

Scale: on  
Value: 0.1

Now use the paint tool (cursor) to ‘paint’ out those areas you want to reduce the leg’s influence on – typically around the waist and groin.



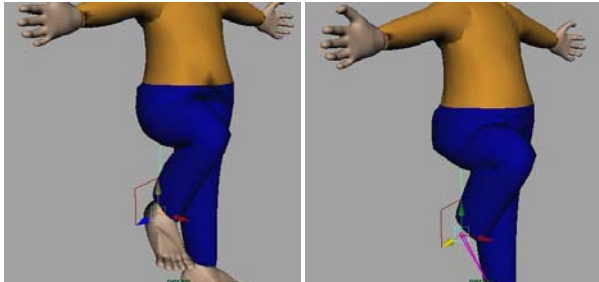
You may need to increase the radius of the paint tool. You can do this by:

Paint tool, Brush, Radius (U)

Now, when you bend the leg the trousers seem to fold more naturally into themselves without leaving a gap.

You can also make the move first and then fix the distortion. However, you will need to note the ikHandle's coordinates so you can return the leg exactly to its original position ready for animating.

Repeat for the LFTleg.



Before

After

When you are completely happy with the deformations you can repeat **Stage 4**

Save as CharUnicycleAnim05

### Stage 6

#### Adding lights

Now we need to add some lights to our scene. There are quite a few lights to choose from. For this exercise we will use a spot light a point light and an ambient light.

Make the material for your centrePivot completely transparent.

First, create a platform for your unicycle animation to sit on and cast shadows to. Create a polygon box 5000, 10, 5000.

Then, start with the spot light.

Create > Lights > Spot Light

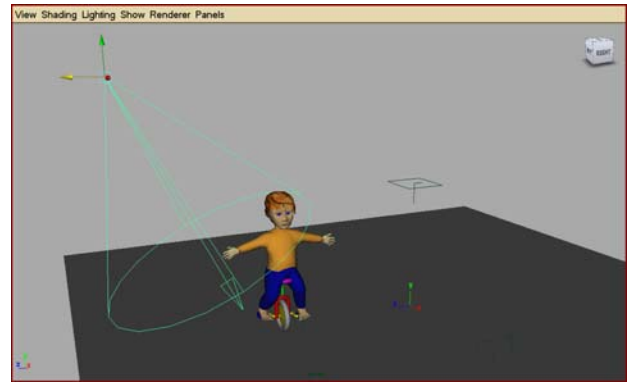
In the Attributes Editor, you may need to adjust its Object Display > Locator Scale properties to 1000 so you can see its icon (so it matches the scale of your modelling space).

You can rotate the spot light so it shines down on your unicycle. Play with the Cone Angle, Penumbra Angle and Dropoff to create the desired effects.

Tick the Depth Map Shadows check box.

Create a point and ambient light and similarly play around with positioning and values (colour, intensity etc) to create the atmosphere desired.

Do a quick check render to see the results.



You may notice some moire patterns on the base platform. These are caused by the base platform casting shadows on itself. You can turn these off by selecting the base platform and unchecking the cast shadows option in the attributes editor: Render Stats > Casts Shadows.

Save as CharUnicycleAnim06

### Stage 7

#### Batch Rendering

In Rendering Menu Mode select:

Window > Rendering Editors > Render Settings

In the image format dropdown menu select AVI. Beneath the dropdown menu you will see the By Frame options activated. You may want to set this to render every 10 frames to speed up the test rendering process.

Start frame 1

End frame 350

By frame 10

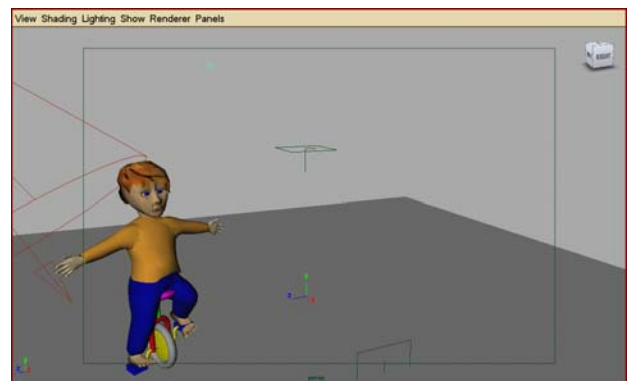
Then: Render > Batch Render

Play around with the various views to try and frame the best capture of the animation. When you are happy with the results, set "By frame" to 1.

If you select:

Camera Setting > Film Gate

you will be able to see how the scene if framed.





### Stage 8

#### *Adding a sound track*

Adding a sound track to your animation gives it another dimension of interest.

Note: your sound track will need to be the same length as your animation.

You can add your soundtrack in Final Cut Pro or other video editing tool.

**When finished, create your final video render and save to disk 😊**

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### Final Note on this Project:

There is clearly a lot more you could do with your animation files – animate a camera to follow the unicycle around, give your character some sway as it pedals and create a different setting and so on. But you do now have the all the necessary skills to make these refinements.

This project has been focussed on the end result. But I hope you will be able to use the skills you have gained to produce much more interesting and challenging projects in the future.

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### Assessment Criteria

Assessment will be conducted in class over the desk. You will be asked to demonstrate that you have mastered the skills covered in this practical. The sorts of questions you may be asked include:

- 1) are the connected parts logically named?
- 2) Have you removed any obvious gross distortions?
- 3) Have you set up your lights to create the desired effect?
- 4) Have you used a non-copyright soundtrack appropriate for this animation?
- 5) How well does your character 'sit' on the unicycle? Is it convincing?

**A Presentation assessment applies to this animation also. See posting on FLO.**