

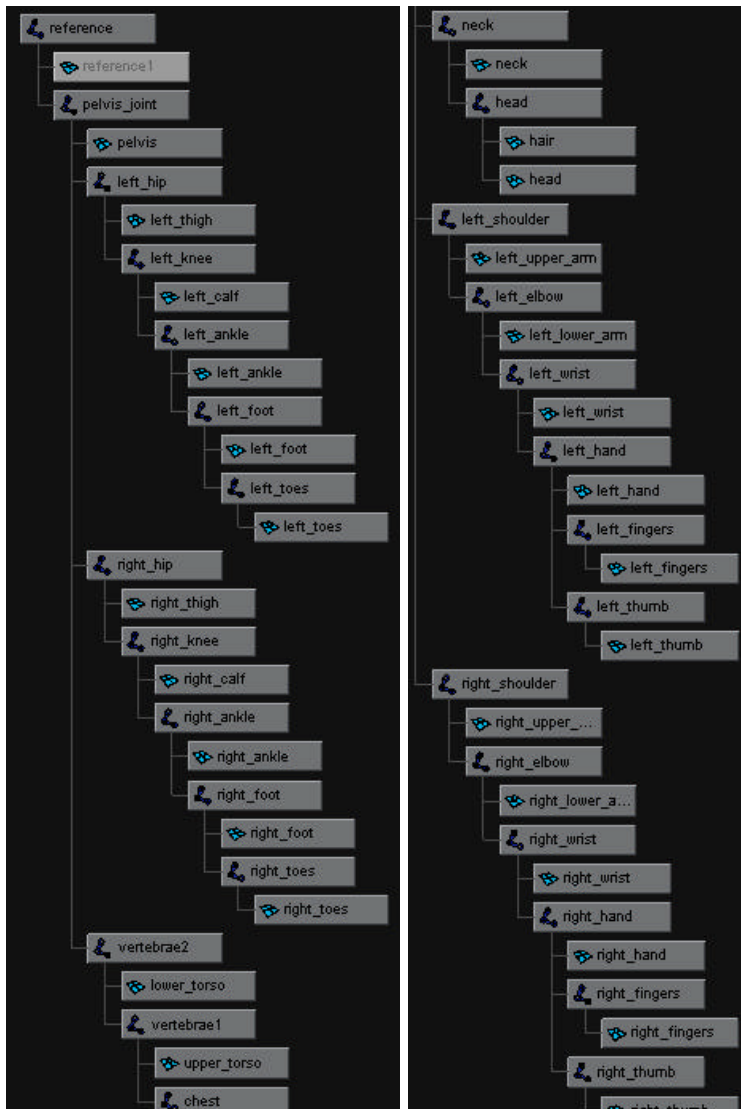
# Motion Capture: From Model to Movement

## Introduction

This tutorial will provide the steps necessary to link a segmented 3D model to motion capture data and eventually into EON software so that the animation may be viewed in stereo. Assuming the model is complete and motion capture data is available, the first step involves creating both an actor and character in Filmbox. This must then be exported to 3d Studios Max, which will be used to load the animated model into EON. This tutorial will also enable you to map motion capture data to deformable figures for import into 3DS Max or Maya.

## The Model

First, a few things about the model you create, using Maya or 3D Studios Max. The model should be segmented in such a way that a full range of motion is available without interfering intersections (i.e. the upper arm shouldn't stick through the shoulder when moved). The segments should also be linked in a hierarchal parenting system. For example, the upper arm should be the parent of the lower arm, the calf should be the parent of the ankle, etc. Following is a reasonable hierarchal structure (note that neck is the child of chest):



The Reference Point can be merely a simple sphere somewhere near the model, it will only be used to translate the model, and won't have any motion capture data attached to it. Also, regarding textures, use only blinn shaders, as required by the EON software. The model should then be exported as an .fbx file using the Filmbox plugin.

### Filmbox

In Filmbox, you need to create both an actor and character. The motion data gets mapped to the *actor*, which is a generic human model. The *character* is your imported 3d model, which will correspond to the movement of the actor.



Two quick pointers to orient you in Filmbox: the R, T, and S keys are shortcuts for rotate, translate, and scale. Movement is controlled by the left mouse button and combinations of ctrl and shift.

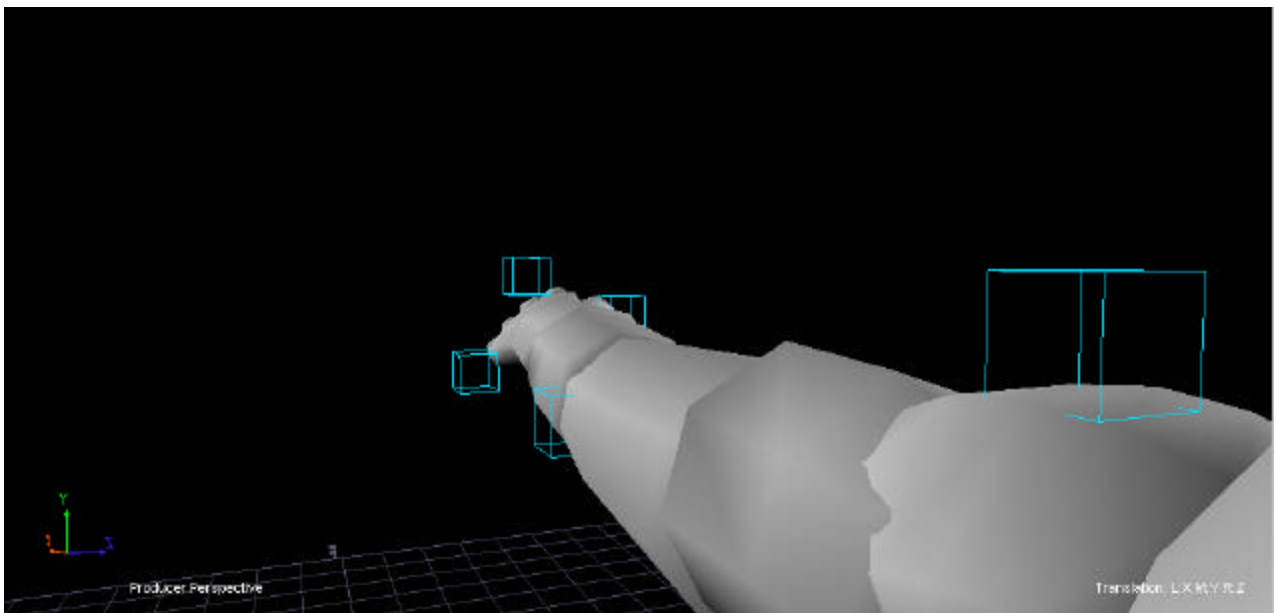
Ctrl + left mouse	zoom
Shift + left mouse	pan
Ctrl + Shift + left mouse	rotate

### Importing motion capture data

To import the data, go to File -> Motion Files -> Import, and find data with an .emf file extension. It is important that the data face the positive Z direction when in a T-pose. If that is not the case, find the T-pose position of the capture data, click on the Reactor Import (the little sphere) and rotate/translate as necessary.

### Creating the actor

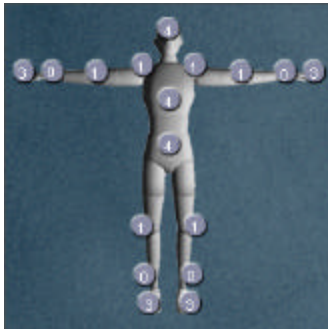
Click on the  Actor tab on the left side of the screen, and click  . This should create a generic human actor. With the motion capture data in a T-pose, you need to match the actor approximately to the data, by rotating, scaling and translating. Try to line up elbows, shoulders, knees, wrists, the head and chest.



Now you need to make a marker set, which links the motion capture markers to appropriate places on the actor. In the lower control field of the screen, in the Marker Set list, click *create*.

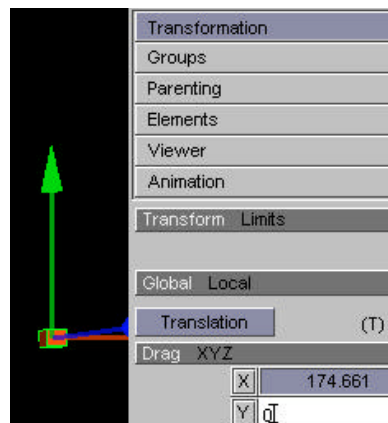
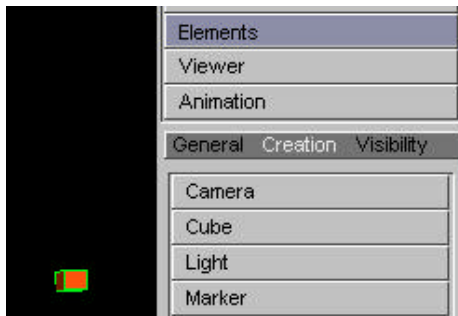


You can drag-select markers by holding spacebar and click-dragging the mouse over the appropriate markers. For example, click drag over the three wrist markers. Then hold alt and drag them to the appropriate location on the human picture below. The 3 wrist markers correspond to the hand on the human picture. Make sure your picture matches the picture below. Now click  to activate them.



### Creating the character

First, import your model by going to File -> Open, finding your file, and clicking *Load*. Click on the  tab on the left side of the screen, and click . To create a "floor", go to the Elements tab in the upper right control field, select the Creation menu, select Marker, and click in the main viewer window. In Translation mode, set y to 0.



Set the floor by alt-dragging the marker to the Left Floor and Right floor fields below.



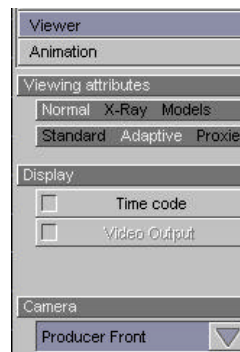
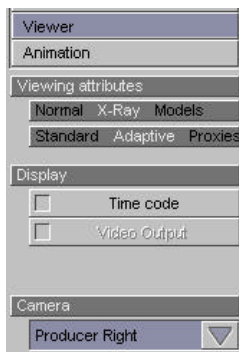
Now switch to X-Ray View, using the Viewer tab in the upper right control field.



Set the reference point by alt-dragging your model's reference point to the Reference field below. Click the '+' next to Base, and drag corresponding skeleton joints to the appropriate body parts. Following are the correspondences:

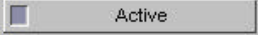



Now click  Characterize . Next, you need to align the foot contacts. Switch to right view by clicking Viewer -> Producer -> Right in the upper right control field. Drag the three foot contacts to the toe, heel, and ball of the foot. Switch to front view, and drag the contacts to the outer edges of each foot.



Under the General tab in the lower control field, select Actor in the Input field.



Some convenient boxes to check are Match Source to match the character to the actor, and Floor Contact, to help with foot contact. Click , and your character should now match the actor's movements. Click the play button to watch the animation.

Now that your actor is mapped to your character, you can load as many motion capture takes as you want, by clicking the Take field and selecting New Take. Check the box Don't Keep Data, then click on the Reactor Import and import a new .emf file. Finally, plot the animation by clicking the  button. You are now ready to load your character in 3D Studios Max.

### **3D Studios Max**

Import your character in Max with File -> Import, which will bring up a settings window. Select your take, and make sure Geometry, Shape, and Animations are checked; you may also check Markers, Lights, and Cameras as appropriate. Play the animation to make sure it imported correctly. Now click on the picture of the hammer tab on the right side of the screen to enable the Utilities menu. At the bottom should be a tab for EON Raptor Web Studio. Click the Interactions tab, which will bring up an Interactions window. On the left field, click the icon to set up a new interaction. For each joint in the body, you need to set up a response in the right field. Click the icon in the right field, which will create a new item. Click on the icon for that item, then click a particular joint and choose *select*. Repeat this process for each joint. You should now be able to play your animation in the Raptor Window by clicking on the model.