

Live Camera POV for Motion Capture

by

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for

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VSFX 753 – Fall 2014

In this project, we set out to use motion capture to drive a virtual camera. Finally we achieved real-time point of view visualization. It allows the cameraman to see what the virtual camera is looking at in real-time. It's a huge improvement in 3D camera animation.

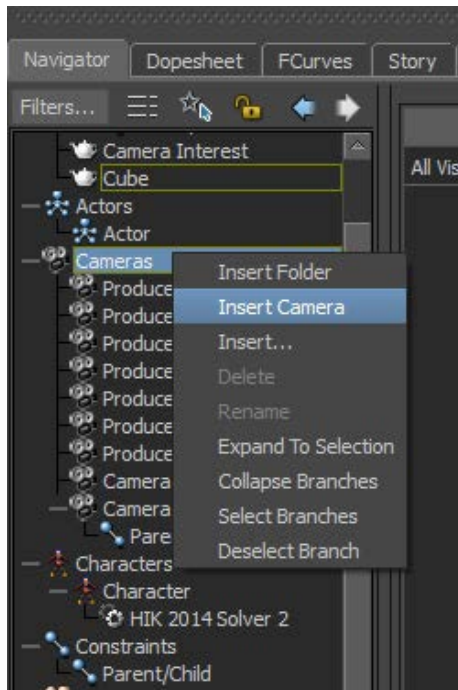
As we all know, camera movement is crucial for both live action and animation. In the real world, there are so many different kinds of camera movements for different story-telling purposes, e.g. using a tripod, dolly, Steadicam or handheld. However in 3D animation world, it takes a tremendous amount of time and efforts to get those subtle details of camera movement out of key frames, especially for POV shots. Motion capture is definitely the best solution currently available for introducing real-world camera movements into a 3D world with ease. We can have fun looking around the virtual world in real time just as if we were actually in it, and fully concentrate on story telling without being bothered by those tedious animation curves any more.

In this project, we used motion capture to capture the movement of a real person who acts as a cameraman. Streaming the data to Motion Builder from Vicon Blade. We imported an environment as well as a previously captured 3D actors into Motion Builder. Then viewed the scene through a camera, which has been bound and placed to the head bone of the captured character. So the person can see exactly what the virtual character sees in the 3D world and have full control of the movement of the virtual camera. By recording the action, we get really cool POV shots even without carrying a camera.

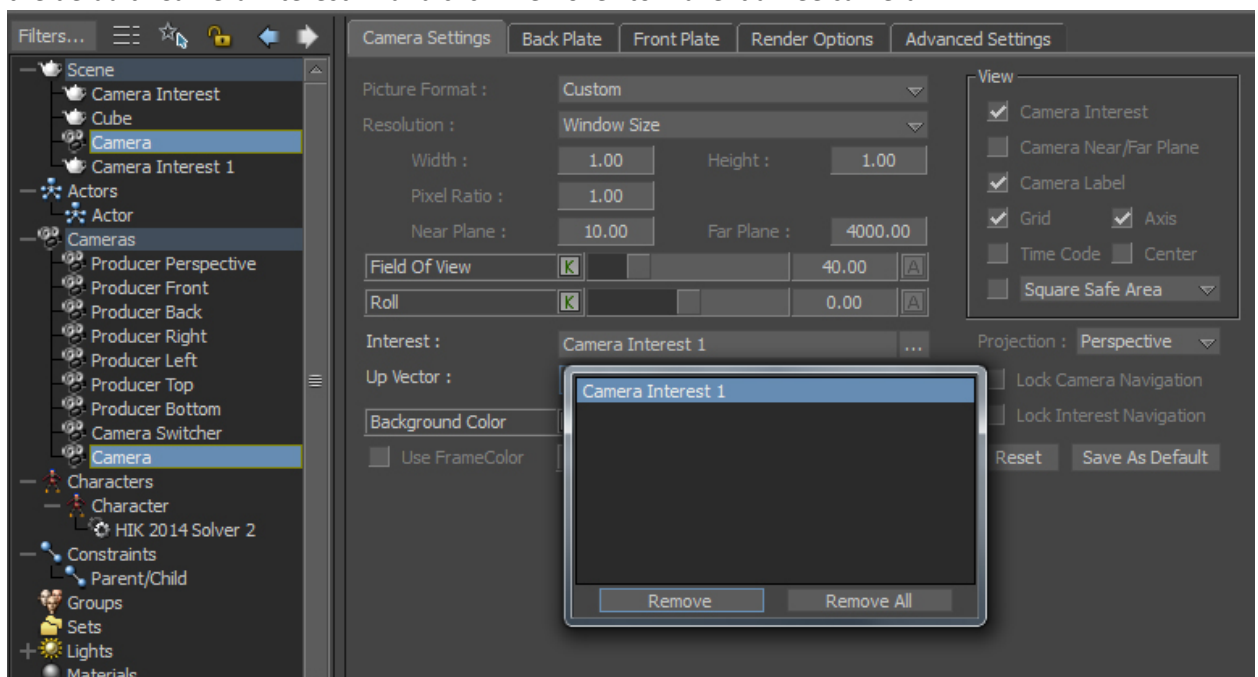
Workflow:

1. In **Vicon Blade** follow the routine set up right up to recording a take.
(Camera Calibration, Character ROM, Labeling and Solving)
See Deborah R. Fowler's website for details:
<http://www.deborahrfowler.com/MotionCaptureResources/Blade2.6/Blade2.6-UsersGuide.html>
2. Open **Motion Builder** 2015.
Drag "I/O" icon in "Devices" under the "Asset Browser" tab in the lower-right corner into the viewport to stream data from Vicon Blade to Motion builder.
Check to see that the ip address is set to 10.7.102.72.
Click online. Create bones, and click stream bones, labeled markers.
Now you should see your character skeleton in Motion Builder 2015.
<http://deborahrfowler.com/MotionCaptureResources/Blade2.6/Blade2.6-Streaming.html>

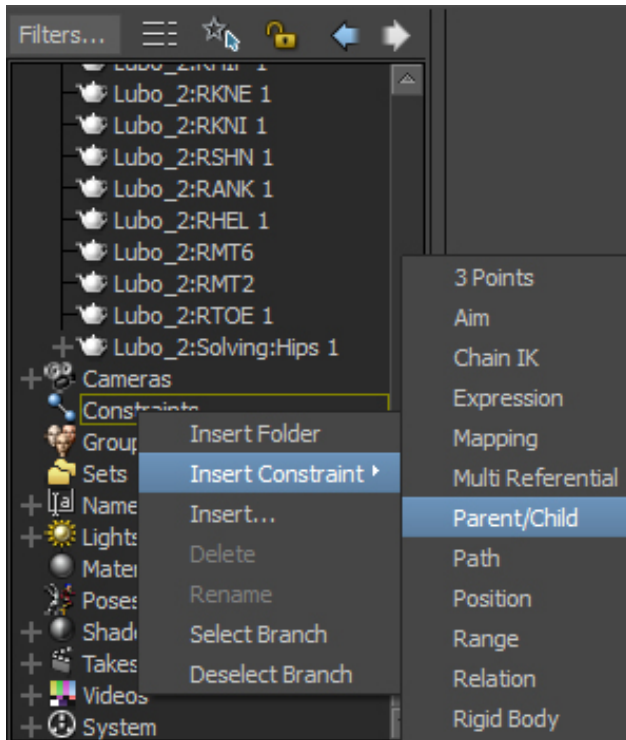
3. Drag the “Character” icon in “Characters” in “Asset Brower” tab onto the root bone (hip bone) and select “Biped” in the pop up menu to characterize the captured skeleton.
4. Right click on the “Cameras” in the “Navigator” tab in the lower-left corner and select “Insert Camera” to create a camera we are going to look through.



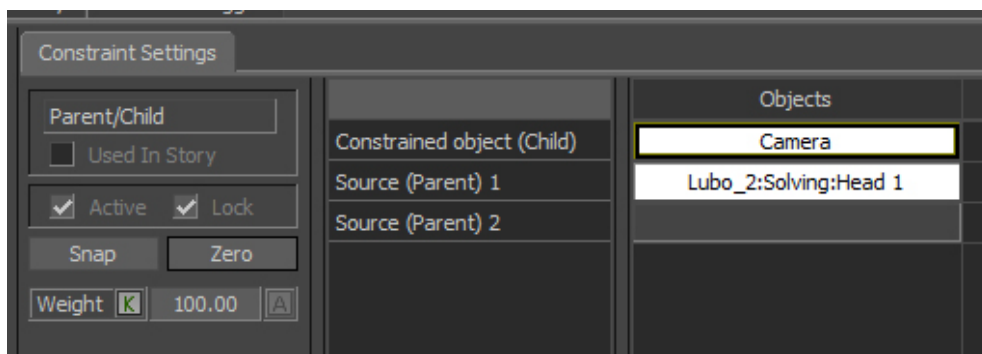
5. Select the camera we've just created, and click “Interest” in the “Camera Settings” tab. Select the default “Camera Interest 1” and click “Remove” to make it a free camera.



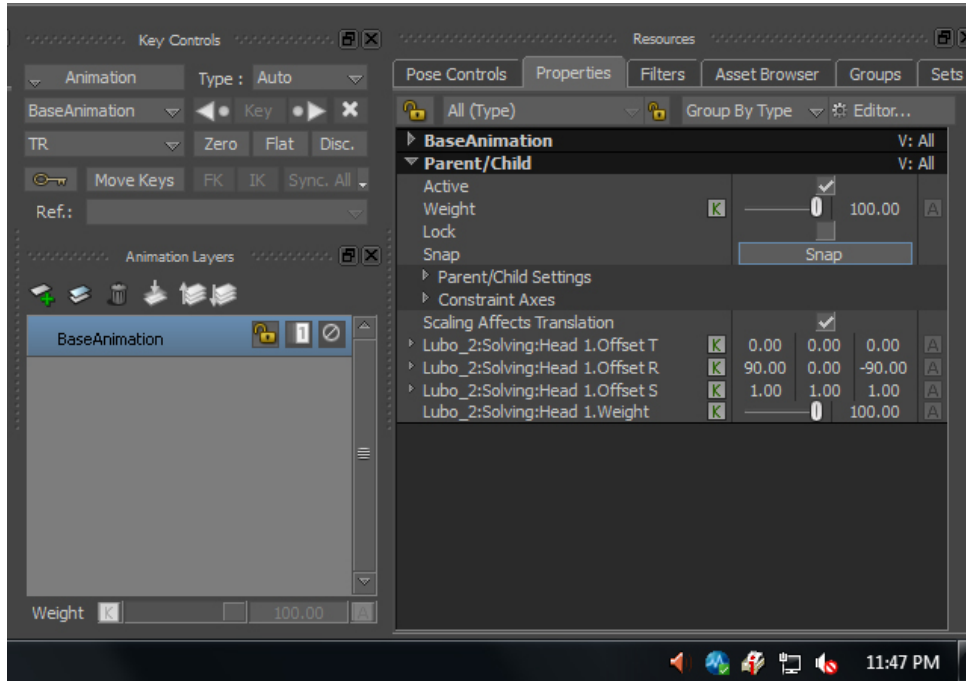
- Then right click on the “Constraints” and select “Insert Constraint -> Parent/Child” to create parent constraint.



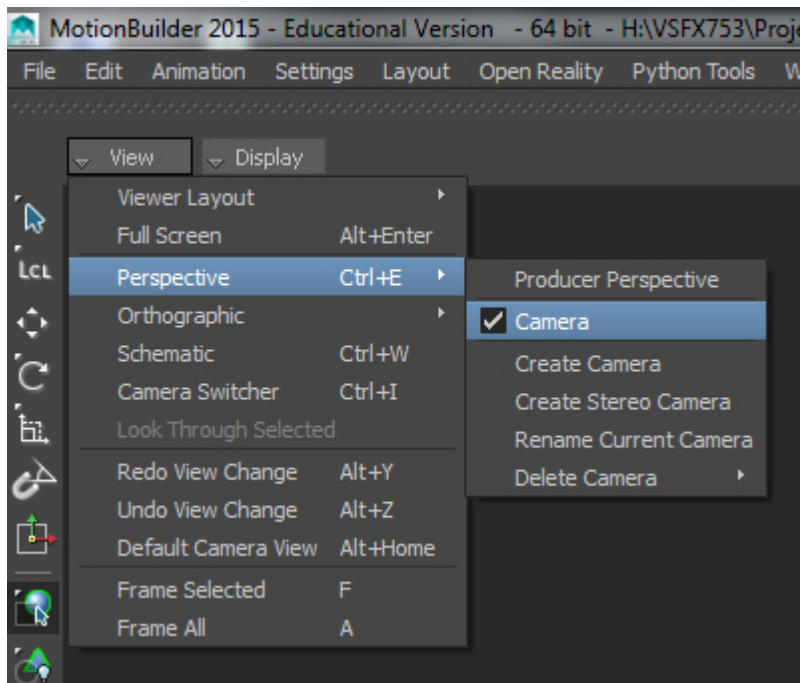
- Next, drag the camera we’ve just created into “Constrained object” field, and the head bone into “Source 1” field to create a parent constraint between them. But the camera will not move with the head right now. You need to click “Zero” button in the first column to move camera to the head bone and activate the constraint.



8. Check the “active” and “lock” check box so the camera will snap to the bone and stick to it, but it aligns in the wrong direction. In order to adjust it, you need to uncheck the “lock”. In the “Properties” tab which located at the lower right corner of the screen, set the Offset R to “90 0 -90” so the camera heads straightforward.



9. Last but not least, switch the viewport to camera view to get the live POV view. You can also go full screen by holding down alt + enter over the viewport.



10. Now we are ready to record a take. Simply go through the basic workflow in Vicon Blade to capture a take.

For detail see:

<http://www.deborahfowler.com/MotionCaptureResources/Blade2.6/Blade2.6-CapturingProcessingTakes.html>

Remember you can merge you motion builder file with a previously recorded take and also bring in an environment.

Handheld Camera as Prop Capture:

Another approach of POV capture is by using a camera prop. The cameraman will carry a prop, which is specifically made for motion capture. It mimics the shape and feeling of a real camera so it will give the cameraman a more realistic shooting experience.

Here I'd like to talk about the workflow and problem of this process in general.

1. Mark the camera prop properly. As the basic requirement in Vicon Blade, a prop must be marked with at least 5 markers. Because camera movement is so sensitive to error, little jitters get amplified on the screen. In this step, we suggest to keep markers as separate from each other as possible while symmetric. This may help reduce capture error to some extent.

2. Go through the general calibration of prop in Vicon Blade.

For details see:

<http://www.deborahfowler.com/MotionCaptureResources/Blade2.6/Blade2.6-PropCapture.html>

3. Before we start capturing, there's one more step which helps us reduce error significantly. In Vicon Blade, go to the "Camera Layout". Lower the "threshold" of all cameras until the dot flickering in the viewport gets better but does not introduce unexpected markers. This is suggested in the Vicon Blade User document.

4. Now we are ready to stream to Motion Builder. Stream the capture data from Vicon Blade to Motion Builder and create a camera in Motion Builder and make parent constraint to the prop object in the same way we mentioned in character capture.

